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स्त्री एवं प्रसूति परिचय

स्त्री शब्द की निरुक्ति

स्त्यै धातु में इट् एवं डीप् प्रत्यय लगने से स्त्री शब्द बना है। 'स्त्य' का अर्थ है देर या पुंज के रूप में एकत्रित करना या किया जाना।

संचीयते	शुक्रशोणिते	अस्यां	सा	स्त्री ।
स्त्यायतः	शुक्रशोणिते	अस्यां	सा	स्त्री ।
स्त्यायेते	शुक्रशोणिते	यस्यां	सा	स्त्री ।

जो शुक्र एवं शोणित का संचय करे उसे स्त्री कहते हैं।

स्त्रीति	स्त्यायति	गर्भोऽस्याम् ।
स्त्यायति	गर्भो	यस्यामिति ।

जिसमें गर्भ का आधान हो या जो गर्भ का धारण करे उसे स्त्री कहते हैं।

स्त्री के पर्याय

स्त्री योषिदबला योषा नारी सीमन्तिनी वधूः ।
प्रतीपदर्शिनी वामा वनिता महिला तथा ॥

(अमरकोष 2/6/2)

योषित, अबला, योषा, नारी, सीमन्तिनी, वधु, प्रतीपदर्शिनी, वामा, वनिता तथा महिला ये सभी स्त्री के पर्याय बताये गये हैं।

प्रसूति तंत्र की निरुक्ति

प्रसूयते इति । तत् पर्याय प्रसवः इत्यमरः ।
प्रधाने सिद्धान्ते सूत्रवाय परिच्छदयोश्च तन्त्र शब्दः ।

अर्थात् जिसमें प्रसव का विस्तृत वर्णन हो उसे प्रसूति तंत्र कहते हैं।

प्रसूति तंत्र दो शब्दों से मिलकर बना है—प्रसूति एवं तंत्र। प्र उपसर्ग सहित सू धातु में क्तिन् प्रत्यय लगने से प्रसूति शब्द बना है जिसका शाब्दिक अर्थ प्रसर्जन, प्रसव, जनन, गर्भमोचन, गर्भमुक्ति इत्यादि है। तंत्र का अर्थ सिद्धान्त, नियम, शास्त्र इत्यादि है।

अतः वह शास्त्र जिसमें संतान उत्पत्ति हेतु गर्भ, गर्भिणी एवं प्रसव से सम्बन्धित नियमों के साथ-साथ प्रसव-क्रिया एवं प्रसूता का विस्तृत विवेचन हो उसे प्रसूति तंत्र कहते हैं।

अष्टाङ्ग आयुर्वेद में प्रसूति तंत्र एवं स्त्री रोग

अष्टाङ्ग आयुर्वेद में प्रसूति तंत्र एवं स्त्री रोगों का वर्णन कौमारभृत्य के अंतर्गत आया है ।

कुमारस्य भरणमधिकृत्य कृतं कौमारभृत्यम् । (चक्र., च.सं.सू. 30/28)

कुमाराणां भृतिर्धारणं पोषणं च तस्येदमिति कौमारभृत्यम् ॥ (चक्र., सु.सं.सू. 1/7)

टीकाकार चक्रपाणि के अनुसार, कुमारों के भरण से संबन्धित कर्म का वर्णन कौमारभृत्य के अन्तर्गत आता है । पुनश्च सुश्रुत संहिता की टीका करते हुए चक्रपाणि ने अपनी पूर्व निरुक्ति में परिवर्तन करते हुए बताया है कि कुमार का भरण, धारण एवं पोषण का वर्णन जिस तंत्र में है, वह कौमारभृत्य है ।

नवग्रहाकृतिज्ञानं	स्कन्दस्य	च	निषेधनम् ।
अपस्मार	शकुन्योश्च	रेवत्याश्च	पुनः पृथक् ॥
पूतनायास्तथाऽन्धाया	शीतपूतना		मण्डिका ।
नैगमेष	चिकित्सा	च	ग्रहोत्पत्तिः सयोनिजा ॥
कौमारतंत्रमित्येतच्छशिशेषु		च	कीर्तितम् ।

(सु.सं.सू. 3/35-37)

आचार्य सुश्रुत ने कौमारभृत्य की परिभाषा सूत्रस्थान प्रथम अध्याय में देने के बाद पुनः तृतीय अध्याय में वर्णन किया है कि नवग्रहों की आकृति का ज्ञान, स्कन्द, अपस्मार, शकुनि, रेवती, पूतना, अन्धपूतना, शीतपूतना, मण्डिका एवं नैगमेष की चिकित्सा तथा योनिव्यापद् प्रतिषेध विषय कौमारभृत्य में समाहित है । इसके अतिरिक्त शारीर स्थान में वर्णित विषयों (रजः शुद्धि, गर्भावक्रान्ति इत्यादि-डल्हण) का भी इसमें समावेश है ।

गर्भोपक्रम	विज्ञानं	सूतिकोपक्रमस्तथा ।
बालानां	रोगशमनी	क्रिया बालचिकित्सम् ॥

(हा.सं.प्रथमस्थान 2/16)

गर्भ के लिए उपक्रम अथवा गर्भ की चिकित्सा का ज्ञान, सूतिका की चिकित्सा का ज्ञान, बालकों के रोगों के संशमन करने की क्रिया बालचिकित्सा कहलाती है ।

इस प्रकार रजः विज्ञान, योनिव्यापद, गर्भावक्रान्ति के साथ गर्भ का धारण, पोषण एवं चिकित्सा, कुमार का भरण, पोषण एवं चिकित्सा, धात्री के दुष्ट स्तन्य की चिकित्सा, सूतिका की चिकित्सा, जो स्त्री रोग एवं प्रसूति तंत्र का विषय है, सभी का वर्णन कौमारभृत्य के अंतर्गत वर्णित है ।

कौमारभृत्य शब्द दो शब्दों से मिलकर बना है कुमार एवं भृत्य । कुमार का शाब्दिक अर्थ संतान से निकलता जाता है । आचार्य काश्यप ने बालक के आयु के विभाजन में गर्भ, बाल, कुमार तीन अवस्थाओं का वर्णन किया है ! भरण से अनेक अर्थ लिया जाता है जैसे पोषण करना, वहन करना, प्राप्त करना, जन्म देना, रक्षा करना इत्यादि !

इस प्रकार संतान के प्राप्त करने के सम्बन्धित सभी विषय कौमारभृत्य के अंतर्गत वर्णित है चूकि अन्धपूतना व्यापद एवं योनि व्यापद गर्भाधान एवं संतान प्राप्ति में बाधक होते हैं, अतः रजः शुद्धि, योनिव्यापद चिकित्सा एवं गर्भावक्रान्ति का ज्ञान अत्यन्त आवश्यक है जिसका वर्णन कौमारभृत्य के अंतर्गत आता है ।

संहिताओं में प्रसूति तंत्र एवं स्त्रीरोग का विषय शारीर स्थान एवं उत्तर तंत्र के साथ-साथ अन्य स्थानों में यत्र-तत्र वर्णित है ।

आचार्य प्रियव्रत शर्मा के अनुसार, प्राचीनकाल में प्रजोत्पादन का विशेष महत्व था, जिस प्रकार आजकल प्रजानिरोध का । प्रजोत्पत्ति के स्रोत एवं माध्यम के रूप में गर्भिणी, प्रसूति, स्त्रीरोग आदि का विचार किया गया है क्योंकि स्त्री के बिना स्वस्थ रहे तथा प्रसव सफलता पूर्वक हुये संतति का प्रादुर्भाव अभिष्ट रूप में नहीं हो सकता । अतएव, यद्यपि आयुर्वेद के अष्टांग में कौमारभृत को ही स्थान मिला परन्तु प्रसूतितंत्र का भी स्थान एवं महत्व वैसे ही अक्षुण्ण है जैसे— शिशु के लिए जननी का ।

यदपत्यानां मूलं नार्यः परं नृणाम् । (च.सं.चि. 30/5)

प्रसूति तंत्र का सम्बन्ध प्रजोत्पादन से है एवं प्रजोत्पादन का मुख्य आधार नारी है ।

नारी ही पुंबीज का ग्रहण करती है, गर्भ को धारण एवं वहन करती है । संतान की प्राप्ति हेतु पथ्य का पालन एवं अपथ्य का परित्याग कर गर्भ की उचित वृद्धि करती है एवं नौ मास के उपरान्त प्रसव का क्लेश सहकर संतान की उत्पत्ति करती है । पुनः वह नारी माता के रूप में नवजातशिशु को अपना स्तनपान कराकर पालती है । इस प्रकार स्वस्थ स्त्री ही स्वस्थ संतान की उत्पत्ति एवं भरण करती है ।

आधुनिक विचारों को ध्यान में रखते हुए कौमारभृत्य से तात्पर्य मात्र 'बाल स्वास्थ्य एवं चिकित्सा' तथा स्त्रीरोग एवं प्रसूति तंत्र से "स्त्रियों के रोगों की चिकित्सा, गर्भ की प्राप्ति, गर्भिणी की चिकित्सा, प्रसूता एवं धात्री के स्वास्थ्य एवं चिकित्सा" से होना चाहिए । स्त्री एवं बालक दोनों का स्वतन्त्र महत्व होने से एवं चिकित्सा का क्षेत्र विकसित होने से दोनों वर्णन अलग-अलग आवश्यक है । अतः प्रसूति तंत्र का ज्ञान संतान की गुणात्मकता एवं परिमाणात्मकता दोनों के लिए आवश्यक है ।

वयभेद से स्त्रीसंज्ञा

पञ्चवर्षा स्मृता बाला मुग्धा च षट्समावधिम् ।

प्रौढा च नववर्षाणि प्रागल्भा च त्रयोदशा ॥

(हा.सं.प्र.स्था. 5/13-14)

- बाला → 5 वर्ष तक
- मुग्धा → 5+6=11 वर्ष तक
- प्रौढा → 11+9=20 वर्ष तक
- प्रागल्भा → 20+13=33 वर्ष तक की आयु वाली स्त्री ।

चतुर्विंशत्समोर्ध्वञ्च यावत्स्यात् सप्तत्रिंशतिः ॥

पूर्ण वयः स्त्रियः प्राप्ता इत्येतदुत्तमं वयः ॥

(हा.सं.प्र.स्था. 5/7)

24 वर्ष से 37 वर्ष तक स्त्री → पूर्णवय, उत्तम अवस्था, उत्तमवय वाली

बालेति गीयते नारी यावद्वर्षाणि षोडश ।
 ततस्तु तरुणी ज्ञेया द्वात्रिंशद्वत्सरावधि ॥
 तदूर्ध्वमधिरूढा स्यात्पंचाशत्वत्सरावधि ।
 वृद्धा तत्परतो ज्ञेया सुरतोत्सववर्जिता ॥

(भा. प्र. पूर्व. 5/281-82)

- बाला → 16 वर्ष
- तरुणी → 32 वर्ष
- अधिरूढा → 50 वर्ष
- वृद्धा → 50 वर्ष से अधिक आयु

अष्टवर्षा भवेत गौरी नववर्षा तु रोहिणी ।
 दशवर्षा भवेत् कन्या अत ऊर्ध्व रजःस्वला ॥

(पाराशर स्मृति 7/6)

- गौरी → 8 वर्ष तक
- रोहिणी → 9 वर्ष तक
- कन्या → 10 वर्ष तक
- रजस्वला → 10 वर्ष से अधिक

रजोमती स्त्री का वय

तद्वर्षाद्द्वादशादूर्ध्व याति पंचाशतः क्षयम् । (सु.सं.सू. 14/6)

12 वर्ष से 50 वर्ष तक।

इस समय रजःसंज्ञक रक्त योनि से प्रवर्तित होता है।

आचार्य वाग्भट्ट ने भी बताया है कि—

योषितश्चोनद्वादशातीतपञ्चाशद्वर्षाया

रजस्तन्यादय

इति ।

(अ.सं.शा. 1/21)

स्त्री में 12 वर्ष के पूर्व एवं 50 वर्ष की आयु के पश्चात् रज-स्तन्य आदि नहीं मिलते हैं ।

गर्भाधान योग्य वय

पञ्चविंशे ततो वर्षे पुमान् नारी तु षोडशे ।
 समत्वागतवीर्यौ तौ ॥

पुरुष 25वें वर्ष तथा स्त्री 16वें वर्ष में समान वीर्य या परिपूर्ण वीर्य हो जाते हैं।

(सु.सं.सू. 35/13)

पूर्णषोडशवर्षा स्त्री पूर्णविंशेन सङ्गता ।

(अ.द.शा. 1/8)

वाग्भट के मत से 16 वर्ष की स्त्री एवं 20 वर्ष का पुरुष सम्पूर्ण वीर्य युक्त हो जाते हैं।

इसी प्रकार 16 वर्ष के पश्चात् स्त्री गर्भाधान योग्य हो जाती है।

वय की विभिन्न अवस्थाओं में दोषों की स्थिति

अवस्था	उपगर्व	वय	दोष
1. बाल्यावस्था	बाला (गौरी, रोहिणी, कन्या) मुग्धा कुमारी	0-11 वर्ष	कफ प्रधान
2. मध्यमावस्था	प्रौढ़ा तरुणी प्रगल्भा अधिरुढा रजोमती	12-50 वर्ष	पित्त प्रधान
3. वृद्धावस्था	—	50 वर्ष से अधिक	वात प्रधान

स्त्री शरीर रचना

श्रोणि

श्रोणि की परिभाषा
 श्रोणिरत्रोरुसन्धेरधस्तात् स्मरन्दिरोपरितनः विभागः ।
 (डल्हण, सु.सं.सू. 35/12)

आचार्य डल्हण ने उरुसन्धि के नीचे एवं स्मरमन्दिर के ऊपर के भाग को श्रोणि माना है।

श्रोणि का माप
 पुरुषोरःप्रमाणविस्तीर्णा स्त्रीश्रोणिः; अष्टादशाङ्गुलविस्तीर्णमुः । तत्प्रमाणा पुरुषस्य कटी ।
 (सु.सं.सू. 35/14)

पुरुष के उर (छाती) के प्रमाणानुसार स्त्री की श्रोणि होती है। स्त्री के उर का विस्तार 18 अंगुल होता है तथा उर के बराबर पुरुष की कटी होती है।

आचार्य चक्रपाणि ने 24 अंगुल पुरुष का उर एवं उसी प्रमाण की स्त्री की श्रोणि बताया है।
 आचार्य डल्हण ने पुरुष का उर 12 अंगुल तथा अन्य मत से 24 अंगुल बताया है एवं इसी प्रमाण की स्त्री की श्रोणि बताया है एवं 18 अंगुल विस्तार का स्त्री का उर तथा पुरुष का कटी बताया है।

पुरुष	स्त्री	माप
उर	= श्रोणि	= 24 अंगुल (चक्र.), 12/24 अंगुल (डल्हण)
कटी	= उर	= 18 अंगुल (सु., चक्र., डल्हण)

पूर्वभागो गुरुः पुंसामधोमागस्तु योषिताम् ।
 (सु.सं.सू. 46/132)

कुमाराणामुरस्तु विशालतरं जघनं तु कुमारीणाम् ।
 (का.सं.सू. 28/6)

पुरुष या कुमार का उर्ध्वभाग गुरु या बड़ा तथा स्त्री या कुमारी का अधोभाग या जघन बड़ा होता है।

श्रोणि की अस्थियाँ

द्वे श्रोणिफलके, एकं भगास्थि । (च.सं.शा. 7/6)

श्रोण्यां पञ्च तेषां गुदभगनितम्बेषु चत्वारि, त्रिकसंश्रितमेकम् ।

(सु.सं.शा. 5/20)

एकैकं भगो त्रिके नितम्बयोश्च द्वे । (अ.सं.शा. 5/70)

चरक संहिता - 3	सुश्रुत संहिता - 5	अष्टांग संग्रह - 4
श्रोणिफलक - 2	गुदास्थि - 1	नितम्बास्थि - 2
भगास्थि - 1	भगास्थि - 1	भगास्थि - 1
	नितम्बास्थि - 2	त्रिक - 1
	त्रिकास्थि - 1	

तेषां.....नितम्बां.....शिरःसु कपालानि । (सु.सं.शा. 5/22)
तानि जानुनितम्ब.....कपाल संज्ञानि । (अ.सं.शा. 5/72)

- नितम्ब में कपालस्थियाँ होती हैं ।

श्रोणि की संधियाँ

त्रयः कटीकपालेषु । (सु.सं.शा. 5/29)

त्रयः कटिकपालेषु । (अ.सं.शा. 5/75)

- आचार्य सुश्रुत एवं वृद्ध वाग्भट के अनुसार, कटिकपाल में 3 संधियाँ होती हैं।
- हाराणचन्द्र के मतानुसार, कटीकपालों में 5 संधियाँ होती हैं।

.....गुदभगनितम्बेषु सामुद्राः.....शिरकटीकपालेषु तुन्नसेवन्यः । (सु.सं.शा. 5/32)

.....गुदभगनितम्बेषु सामुद्राः.....कटिकपालेषु तूनसेवनी संज्ञाः। (अ.सं.शा. 5/72)

- गुद, भग एवं नितम्ब में सामुद्र संधियाँ होती हैं।
- कटीकपालों में तुन्नसेवनी संधियाँ होती हैं।
- आचार्य वाग्भट ने तुन्नसेवनी के स्थान पर "तूनसेवनी" कहा है।

योनि

स्त्रियों में योनि की गणना बहिर्मुख स्रोतस् में की गई है जो रक्त को नीचे की ओर वहन करती है।

श्रवण-नयन-वदन-घ्राण-गुद-मेढ्राणि नव स्रोतांसि नराणां बहिर्मुखानि, एतान्येव स्त्रीणामपराणि च त्रीणि द्वे स्तनयोरधस्ताद्रक्तवहं च ॥ (सु.सं.शा. 5/10)

कुल 'नौ' बहिर्मुख स्रोत पुरुषों में होते हैं। परन्तु स्त्रियों में इनके अतिरिक्त तीन अधिक स्रोत होते हैं, दो स्तनों में एवं एक रक्त/रज को नीचे की ओर वहन करते हैं।

आचार्य वाग्भट ने भी दो स्तन एवं एक रक्तपथ में कुल तीन स्रोत स्त्रियों में अधिक माने हैं।

आचार्य भावमिश्र ने स्त्रियों में तीन रंध्र अधिक माने हैं, जिसमें दो स्तन एवं एक गर्भ-वर्त्म हैं।

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योनि की आकृति

शङ्खनाभ्याकृतियोनिस्र्यावर्ता
तस्यास्तृतीये त्वावर्ते सा गर्भशय्या प्रकीर्तिता ।
प्रतिष्ठिता ॥

(सु.सं.शा. 5/55)

स एव गर्भस्याधानं कुर्याद्रर्भाशये स्त्रियाः ।
शङ्खनाभ्याकृतियोनिस्र्यावर्ता सा च कीर्तिता ॥
तस्यास्तृतीये त्वावर्ते गर्भशय्या प्रतिष्ठिता ।

(भा.प्र.पूर्व 3/31,86-87)

योनिस्तु शङ्खनाभ्याकृतिस्र्यावर्ता तस्यास्तृतीय आवर्ते पित्तपक्वाशयान्तरे.....गर्भशय्या ।
(अ.सं.शा. 5/91)

योनि शंखनाभि के आकार की होती है। इसमें तीन आवर्त होते हैं। इसके तीसरे आवर्त, जो आवर्त पित्ताशय और पक्वाशय के बीच में होता है, में गर्भशय्या (गर्भाशय) रहता है।

योनि की नाड़ियाँ एवं उसके फल

मनोभवागारमुखेऽबलानां तिस्त्रो भवन्ति प्रमदाजनानाम् ।
समीरणा चन्द्रमुखी च गौरी विशेषमासामुपवर्णयामि ॥
प्रधानभूता मदनातपत्रे समीरणा नाम विशेषनाडी ।
तस्या मुखे यत् पतितं तु वीर्यं तन्निष्फलं स्यादिति चन्द्रमौलिः ॥
या चापरा चान्द्रमसी च नाडी कन्दर्पगेहे भवति प्रधाना ।
सा सुन्दरी योषितमेव सूते साध्या भवेदल्परतोत्सवेषु ॥
गौरीति नाडी यदुपस्थगर्भे प्रधानभूता भवति स्वभावात् ।
पुत्रं प्रसूते बहुधाऽङ्गना सा कष्टोपभोग्या सुरतोपविष्टा ॥

(भा.प्र.पूर्व. 3/17-20)

आचार्य भावमित्र ने योनि को "मनोभवागार मुख" संज्ञा दी है। इसमें तीन नाड़ियाँ होती हैं- समीरणा, चन्द्रमुखी एवं गौरी जिसकी व्याख्या निम्न प्रकार से की है—

प्रधान नाड़ी	स्थान	फल
1. समीरणा	मदनातपत्र (स्मरातपत्र)	
2. चन्द्रमसी	कन्दर्पगेह (योनिनालिका मध्य)	इसमें वीर्य गिरने पर वह निष्फल होता है।
3. गौरी	उपस्थगर्भ (योनिनालिका की अत्यधिक गहराई)	कन्या प्रसविनी, रति में सुखसाध्य पुत्र प्रसविनी, कष्टोपभोग्या या अधिक रति से सन्तुष्ट होने वाली

गर्भशय्या/गर्भाशय

स्त्रीणां गर्भाशयोऽष्टम् इति । (सु.सं.शा. 5/8)

स्त्रीणां गर्भाशयोऽष्टमः । (का.सं.खि. 9/16)

स्त्रीया गर्भाशयोऽष्टम् इति । (सु.सं.शा. 5/8)

गर्भाशय के पर्याय— कुक्षि, विपुलस्रोत, धरा।

पुरुषों में सात आशय एवं स्त्रियों में इसके अतिरिक्त आठवाँ आशय “गर्भाशय” होता है।

आचार्य शाङ्गधर एवं भावमिश्र ने स्त्रियों में पुरुष से तीन आशय अधिक माने हैं- एक गर्भाशय जिसे “धरा” संज्ञा दी है एवं प्रवृद्ध स्तनों को “स्तन्याशय” की संज्ञा दी है।

पित्तपक्वाशयोर्मध्ये गर्भशय्या; यत्र गर्भस्तिष्ठति । (सु.सं.शा. 5/51)

शङ्खनाभ्याकृतियोनिस्र्यावर्ता सा प्रकीर्तिता ।

तस्यास्तृतीये त्वावर्ते गर्भशय्या प्रतिष्ठिता ॥

यथा रोहितमत्स्यस्य मुखं भवति रूपतः ।

तत्संस्थानां तथारूपां गर्भशययं विदुर्बुधा ॥

(सु.सं.शा. 5/55-56, भा.प्र.पूर्व. 3/31-32)

स्त्रीणान्तु वस्तिपार्श्वगतो गर्भाशयः सन्निकृष्टः ॥ (सु.सं.चि. 7/33)

गर्भाशय की आकृति “रोहित मत्स्य मुख” सदृश होती है।

गर्भाशय का स्थान—

- शंखनाभ्याकृति योनि के तीसरे आवर्त में।
- पित्ताशय एवं पक्वाशय के मध्य।
- वस्ति के पार्श्व में।

तेषामधस्ताद्विपुल स्रोतः कुण्डलसंस्थितम् ।

जरायुणा परिवीतं स गर्भाशय उच्यते ॥

(का.सं.शा. 3/6-7)

हृदय, यकृत, प्लीहा, फुफ्फुस परस्पर संबद्ध होते हैं एवं इसके नीचे जरायु से युक्त तथा कुण्डलिनी चक्र में स्थित एक बड़ा स्रोत होता है जिसे गर्भाशय कहते हैं।

आचार्य डल्हण ने रोहित मत्स्य के मुख से उसी के सदृश ही गर्भाशय की आन्यन्तर सुषिरता का वर्णन किया है:

गर्भाशय गर्भ का आधार होता है।

स्मरमन्दिर/स्मरातपत्र/मदनातपत्र

आचार्य डल्हण के अनुसार, स्मरातपत्र बड़े पिप्पलपत्र के समान आकृति वाले भग के ऊपर के भाग में स्थित होता है तथा इसके नीचे आर्तववह या रक्तवह का स्थान होता है। इसे ही स्मरमन्दिर भी कहा है। आचार्य भावमिश्र ने इसे मदनातपत्र कहा है।

द्वादशाङ्गुलानि भगविस्तारमेहन.....। (सु.सं.सू. 35/13)

आचार्य सुश्रुत ने भग का विस्तार 12 अंगुल बताया है।
आचार्य डल्हण ने भग से योनि एवं विस्तार से रन्ध्र मानकर इस द्वादश अंगुल परिणाह को कामशास्त्र वर्णित धमनी-जाति की स्त्रियों के भग का प्रमाण बताया है। भग की आकृति विपुल पिप्पल पत्र सदृश होती है।

स्रोतस्

1. आर्तववह स्रोतस्

आर्तववहे द्वे, तयोर्मूलं गर्भाशय-आर्तव-वाहिन्यश्च धमन्यः; तत्र विद्धायां बन्ध्यात्वं मैथुनासहिष्णु-त्वमार्तवनाशश्च । (सु.सं.शा. 9/12)

ग्यारह युग्म आभ्यन्तर स्रोतसों में से एक युग्म अर्थात् दो आर्तववह स्रोतस् होते हैं, इनके मूल गर्भाशय एवं आर्तववाही धमनियाँ हैं। इनका वेध होने पर बन्ध्यत्व, मैथुन असहिष्णुता एवं आर्तवनाश ये लक्षण होते हैं। आचार्य चरक ने गर्भप्रकरण में एक आर्तववह स्रोतस् का वर्णन किया है।

2. स्तन्यवह स्रोतस्

.....एतान्येव स्त्रीणामपराणि च त्रीणि द्वे स्तनयोरधस्ताद्रक्तवहं च ॥ (सु.सं.शा. 5/10)

.....अन्यानी च त्रीणी स्त्रीणां स्तनौ रक्तपथश्च ॥ (अ.सं.शा. 6/34)

स्त्रियों में पुरुष से 3 बहिर्मुख स्रोत अधिक माने गये हैं- दोनों स्तनों में 1-1 स्तन्यवह स्रोतस् एवं एक रक्तपथ अर्थात् रक्त/रज का वहन करने वाली योनि में।

धमनी

1. उर्ध्वगामी धमनी

.....द्वे स्तन्यं स्त्रिया वहतः स्तनसंश्रित, ते एव शुक्रं नरस्य स्तनाभ्यामभिवहतः.....। (सु.सं.शा. 9/5)

स्त्रियों के स्तनों में स्तन्य का वहन करने हेतु दो धमनियाँ होती हैं। वे ही दो धमनियाँ पुरुष के स्तनों में रहकर शुक्र का वहन करती हैं।

2. अधोगामी धमनी

.....शुक्रवहे द्वे शुक्रप्रादुर्भावाय, द्वे विसर्गाय, ते एव रक्तमभिवहतो विसृजतश्च नारीणामार्तव-संज्ञम्.....। (सु.सं.शा. 9/7)

पुरुषों में शुक्र प्रादुर्भाव के लिए शुक्र का वहन करने वाली दो तथा शुक्र का विसर्ग करने के लिए शुक्र का वहन करने वाली दो, इस प्रकार कुल चार धमनियाँ होती हैं। वे ही स्त्रियों में रक्त का अभिवहन हेतु (2 प्रादुर्भाव एवं 2 विसर्ग) होती हैं।

शिरा

द्वात्रिंशच्छ्रोण्यां, तासामष्टावशस्त्रकृत्याः द्वे द्वे विटपयोः, कटीकतरुणयोश्च । (सु.सं.शा. 7/24)

श्रोणि में 32 शिराएँ होती हैं। वातवह, पित्तवह, कफवह एवं रक्तवह प्रत्येक की 8-8 शिराएँ होती हैं। इसमें से 8 अवेध्य शिराएँ हैं— विटप में 4 एवं कटीकतरुण में 4 हैं।

.....द्वे द्वे स्तनमूले स्तरोहित.....। (सु.सं.शा. 7/24)

वक्ष की 14 अवेध्य शिराओं में से स्तन में 8 अवेध्य शिराएँ हैं (दोनों स्तनमूल में 2+2=4 तथा दोनों स्तनरोहित में 2+2=4)।

मर्म

वक्षमर्म के अन्तर्गत स्तनों में स्थित स्तनरोहित एवं स्तनमूल दोनों में 2-2 अर्थात् 4 मर्मों का वर्णन है।

	स्तनरोहित	स्तनमूल
स्थान	स्तन के 2 अंगुल ऊपर	स्तन के 2 अंगुल नीचे
संख्या	2	2
प्रकार	कालान्तर प्राणहर, मांस मर्म	कालान्तर प्राणहर, सिरा मर्म
प्रमाण	अर्ध अंगुल	एक अंगुल
आघात होने पर लक्षण	रक्तपूर्ण कोष्ठता, श्वास-कास से मृत्यु	कफपूर्ण कोष्ठता, श्वास-कास से मृत्यु

आचार्य सुश्रुत एवं वृद्ध वाग्भट ने अश्मरी चिकित्सा में आठ मर्मस्थानों को आघात से बचाने का निर्देश दिया है ।

मूत्रवहशुक्रवहमुष्कस्रोतमूत्रप्रसेकसेवनीयोनिगुदवस्तीनष्टौ परिहरेत् । (सु.सं.चि. 7/36)

सेवनी शुक्रहरणी स्रोतसी फलयोर्गुदम् । मूत्रसेकं मूत्रवहं योनिर्वस्तिस्तथाऽष्टमः ॥ (सु.सं.चि. 7/38)

कर्मणि तु मूत्रवहशुक्लवहमुष्कस्रोतमूत्रप्रसेकसेवनीयोनिगुदवस्तयोऽष्टौ परिहर्तव्याः॥

(अ.सं.चि. 13/32)

मूत्रवह, शुक्रवह, मुष्क स्रोत, मूत्रप्रसेक, सेवनी, योनि, गुदा तथा बस्ति को आघात से बचाना चाहिए।

मर्म	आघात होने पर उत्पन्न लक्षण
मूत्रवह	मरण, बस्ति में मूत्रपूरण
शुक्रवह	मरण, कलैब्य
मुष्कस्रोत	ध्वजभङ्ग
मूत्रप्रसेक	मूत्रप्ररक्षण (मूत्रस्राव)
सेवनी	रुजा
योनि	रुजा
गुदा	सद्यःमृत्यु
वस्ति	अश्मरी के व्रण के अतिरिक्त अन्य व्रण से सद्यः मृत्यु

स्त्रीणां तु विंशतिरधिका । दश तासां स्तनयोरेकैकस्मिन् पञ्च पञ्चेति, यौवने तासां परिवृद्धिः ॥
अपत्यपथे चतस्रः—तासां प्रसूतेऽभ्यन्तरतो द्वे, मुखाश्रिते बाह्ये च वृत्ते द्वे गर्भच्छिद्रसंश्रितास्तिष्ठः
शुक्रार्तवप्रवेशिन्यस्तिस्त्र एव । (सु.सं.शा. 5/50-51)

आचार्य सुश्रुत ने कुल 500 पेशियों का वर्णन पुरुष शरीर में किया है तथा स्त्रियों में 20 पेशियाँ अधिक बतायी हैं। अर्थात् स्त्रियों में कुल 520 पेशियाँ बतायी हैं।

- प्रत्येक स्तन में 5-5 अर्थात् दोनों स्तनों में 10 पेशियाँ होती हैं। उनकी वृद्धि यौवनावस्था में होती है।
- अपत्यमार्ग में 4 पेशियाँ - 2 आभ्यन्तर प्रसृत एवं 2 मुखाश्रित तथा वृत्ताकार
- गर्भ छिद्र में 3 पेशियाँ
- शुक्र-आर्तव प्रवेशिनी 3 पेशियाँ होती हैं।

आचार्य वृद्ध वाग्भट के अनुसार—

- स्तनों में 10 पेशियाँ होती हैं।
- योनि में 10 पेशियाँ (आभ्यान्तराश्रित-2, मुखाश्रित-2, गर्भमार्गाश्रित-3, शुक्रार्तव प्रवेशिनी-3)

भावमिश्र ने भी सुश्रुत का ही अनुकरण किया है।

आचार्य शार्ङ्गधर ने 20 संख्या ही बताई है।

तिस्रश्च गर्भाशये शुक्रार्तवप्रवेशिन्यो गर्भशय्यायां प्रतिबद्धा ।

(इन्दु, अं.सं.शा. 5/91)

अर्थात् इन्दु ने शुक्रार्तव प्रवेशिनी पेशियों को गर्भशय्या से प्रतिबद्ध माना है।

महत्वपूर्ण

भग का विस्तार—12 अंगुल एवं आकृति-विपुल पिप्पल पत्र सदृश

पुरुष का उर = स्त्री की श्रोणि

पुरुष का कटि = स्त्री का उर

श्रोणि की अस्थियाँ— चरक - 3, सुश्रुत - 5, वाग्भट - 4

श्रोणि की संधियाँ— सुश्रुत - 3 (कटीकपालकों में), हाराणचन्द्र - 5 (कटीकपालकों में)

बहिमुख स्रोतस् 1. पुरुष - 9

2. स्त्री - 12 → 9 + 3 (2 स्तनवह + 1 रक्तपथ)

योनि → शंखनाभि आकृति, 3 आवर्तयुक्त, 3 नाड़ी युक्त

गर्भाशय की आकृति → रोहितमत्स्यमुख

अष्टमोआशय → गर्भाशय = धरा (भावमिश्र)

आभ्यन्तर स्रोतस् / आर्तववह स्रोतस् = 2

स्तन्यवह स्रोतस् = 2

- धमनी— उर्ध्वगामी = 2 (स्तन्य का वहन)
 अधोगामी = 4 (रक्त का वहन)
- शिराएँ— श्रोणि में 32 जिसमें 8 अवेध्य (स्तनमूल में 4 अवेध्य, स्तनरोहित में 4 अवेध्य)
- मर्म— 8 (स्तनमूल में 4, स्तनरोहित में 4)
- पेशी— 520, 500+20—10 (प्रत्येक स्तनों में 5)
 10 योनि में— 4 अपत्यपथ में
 3 गर्भ छिद्र
 3 शुक्रार्तवप्रवेशिनी

Anatomy of Female Reproductive System

External Female Genital Organs

The external genital organs include the mons pubis, labia majora, labia minora, Bartholin glands, and clitoris. The area containing these organs is called the vulva.

The external genital organs have three main functions:

- Enabling sperm to enter in the uterus
- Protecting the internal genital organs from infectious organisms
- Providing sexual pleasure

Mons pubis

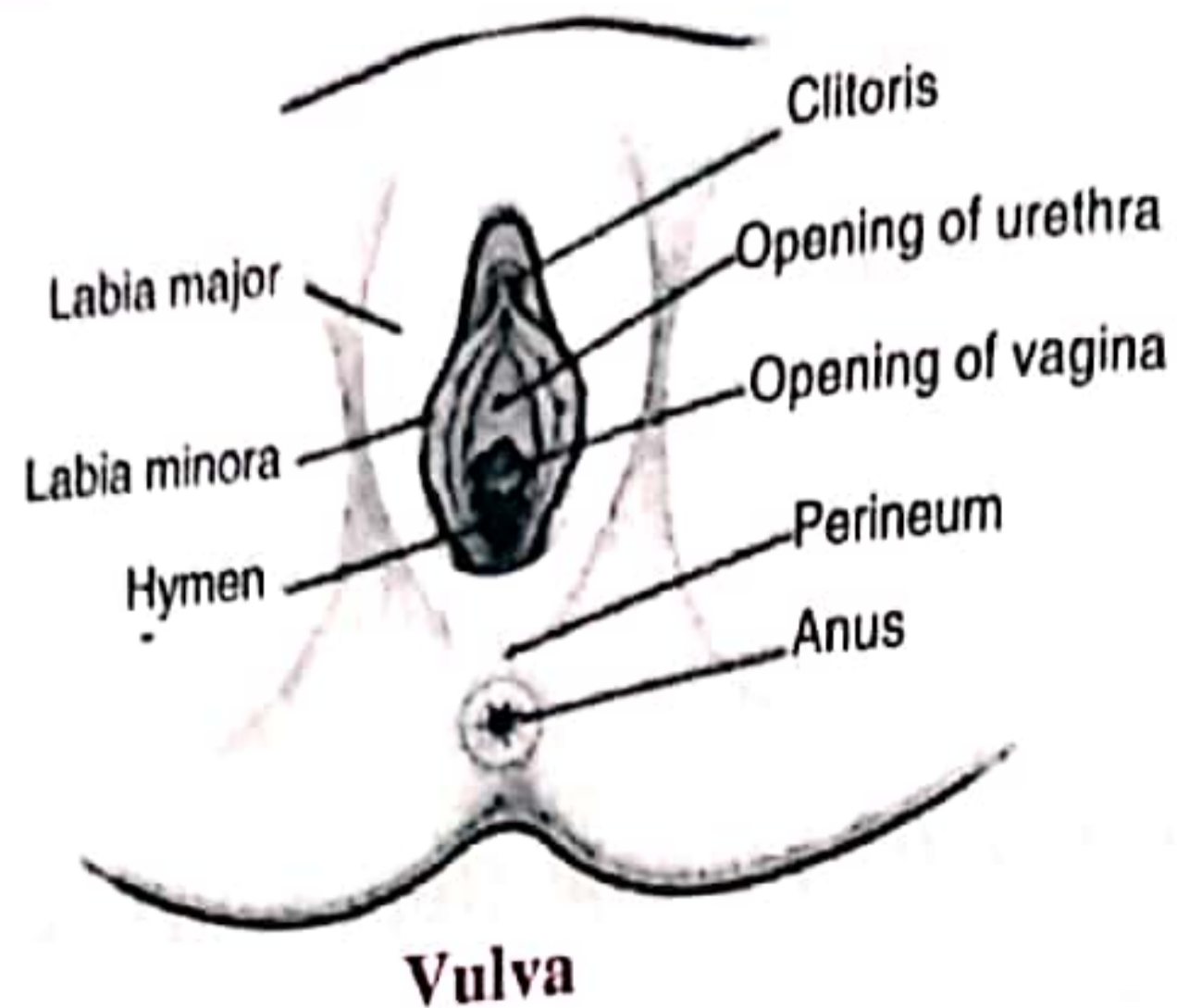
It is a rounded mound of fatty tissue that covers the pubic bone. During puberty, it become covered with hair. The mons pubis contains sebaceous (oil-secreting) glands that release substances that are involved in sexual attraction. The main function of mons pubis is to give cushioning and protection to the pubic bone and tissues lying beneath.

Labia majora

These are fleshy folds of tissue that enclose and protect the other external genital organs. They are comparable to the scrotum in males. The labia majora contain sweat and sebaceous glands, which produce lubricating secretions. During puberty, hair appears on the labia majora. The round ligaments terminate at its upper borders.

Labia minora

It is up to 2 inches wide. The labia minora lie just inside the labia majora and surround the openings the vagina and urethra. Posteriorly fuses across the midline to form a fold of skin called fourchette. A rich supply of blood vessels gives the labia minora a pink colour. During sexual stimulation, these blood vessels become engorged with blood, causing the labia minora to swell and become more sensitive to stimulation. It contains connective tissues, numerous sebaceous glands, erectile muscle fibers and numerous nerve endings. It is devoid of hair follicles.



Clitoris

It is located between the labia minora at their upper end, measuring about 2.5 cms. It is a small protrusion and homologous to the penis in the male. It is formed by two corpora cavernosa and the glans covered by the prepuce. The clitoris, like the penis, is very sensitive to sexual stimulation and become erect. Stimulating the clitoris can result in an orgasm.

Vestibule

It is triangular space bounded anteriorly by the clitoris, posteriorly by fourchette and on either side by labia minora. There are four openings :

1. **Urethral opening** - The opening to the urethra, which carries urine from the bladder to the outside, is located above and in front of the vaginal opening.
2. **Introitus** - The opening to the vagina is called the introitus. The vaginal opening is the entryway for the penis during sexual intercourse and the exit for blood during menstruation and for the baby during birth.
3. **Openings of Bartholin's gland** - One pair of bartholin gland situated on each side in superficial perineal pouch. Each gland has a duct which opens into vestibule outside the hymen. When stimulated, they secrete a thick alkaline fluid that supplies lubrication for intercourse.

Perineum

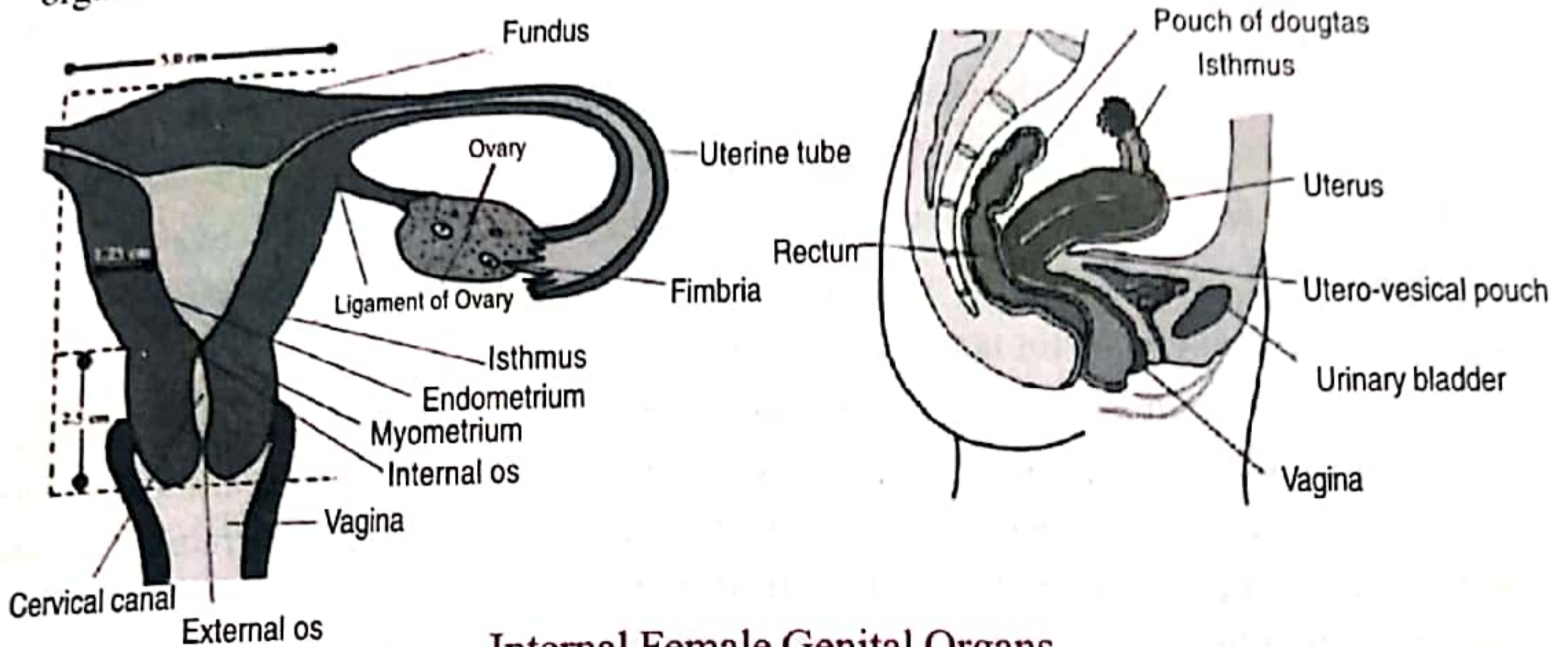
It is conventionally included in vulva. The area between the opening of the vagina and the anus, below the labia majora, is called the perineum. It varies in length from almost 1 to more than 2 inches (2 to 5 cms).

The labia majora and the perineum are covered with skin similar to that on the rest

of the body. In contrast, the labia minora are lined with a mucous membrane, whose surface is kept moist by fluid secreted by specialized cells.

Internal Female Genital Organs

Vagina, Uterus, fallopian tubes and ovaries are included in internal female genital organ.



Internal Female Genital Organs

Vagina

The vagina is fibromuscular passage that connects the uterus to the introitus.

Position

It is located in front of the rectum and behind the bladder. Upper region of the vagina connects to the cervix of the uterus. The external opening is partially closed by a thin fold of tissue known as the hymen. The opening (vaginal orifice) is partially covered by the labia majora. The canal is directed upwards and backwards forming an angle of 45 degree with the horizontal in erect posture.

Size and Shape

It is about 9 cm (3.5 inches) long on average and diameter of vaginal canal is about is 2.5 cm. The vaginal canal is narrowest at the upper and lower ends.

Vagina has four walls an anterior, a posterior and two lateral walls. The length of anterior and posterior wall is approximately 7 cm and 9 cm respectively. The muscle of walls of the vagina is thick and elastic in order to accommodate both the movement of the penis during intercourse and the passage of a child during delivery. The muscular wall is composed of two layers of muscle fibres, a weak internal circular layer and a strong



external longitudinal layer. Covering of the muscle tissue is a sheath of connective tissue that consists of blood vessels, lymphatic ducts and nerve fibres. This layer of connective tissue joins the tissues of the urinary bladder, rectum, and other pelvic structures.

The vagina consists of four layers:

1. Mucous membrane the innermost layer of stratified squamous epithelium. It has numerous rugae.
2. Submucous layer with vascular loose areolar tissue.
3. Muscular layer – inner circular, outer longitudinal
4. Fibrous layer with rich blood supply

There are four fornices one anterior, one posterior and two lateral. The posterior fornix is deeper and anterior is most shallow.

The lining of the vaginal cavity responds to stimulation from the various ovarian hormones by either building new cell layers or shedding the old ones. The thickness of the lining varies directly with the amount of oestrogen secreted from the ovaries; the lining is thickest and most elastic during ovulation and during pregnancy. The vaginal lining characteristically has several transverse ridges known as vaginal rugae, which permit expansion of the vaginal cavity. These tend to disappear in older women and in those women who have borne children.

There are no glands in the vaginal wall. The mucus that lubricates the vaginal cavity had traditionally been ascribed to the cervix or to the Bartholin's glands in the labia. The cells in the lining contain large quantities of glycogen. Bacteria (Doderlein's Bacillus) within the vagina ferment the glycogen, so that lactic acid is produced. The lactic acid makes the surface of the lining slightly acidic, thus protecting against disease-causing microorganisms that have gained entry via the vaginal orifice.

Development

Upper 4/5th, above the hymen is derived from endoderm of the canalised sino-vaginal bulbs. Lower 1/5th, below the hymen is developed from the endoderm of the urogenital sinus. The musculature is developed from mesoderm and external vaginal orifice from the genital fold ectoderm.

Vascular Connections

Arterial supply :

- (a) Cervicovaginal branch of uterine artery
- (b) Vaginal artery

- (c) Middle rectal artery
- (d) Internal pudendal artery

Venous supply :

- (a) Internal iliac vein
- (b) Internal pudendal vein

Lymphatic supply

- (a) Internal iliac group
- (b) Superficial inguinal group

Nervous supply

Sympathetic and Parasympathetic supply from the pelvic plexus. Lower part is supplied by the pudendal nerve.

Functions :

- Excretory duct for menstrual blood.
- As coitus canal.
- Helps in capacitation of sperm by supplying sperm.
- Protective function - acidic vaginal secretion prevents infection.
- Absorbative function
- Seminal prostaglandins are absorbed to cause contraction of myometrium and fallopian tube.
- Immunological function
- Anti-sperm antibody and antimicrobial antibodies are present in vaginal secretion.
- As birth canal for delivery of baby.

Uterus

The uterus is a hollow muscular organ located in the pelvic cavity. It serves as part of the pathway for sperm deposited in the vagina to reach the uterine tubes. It is also the site of implantation of a fertilized ovum, development of foetus during pregnancy and labour. During reproductive cycles when implantation does not occur, the uterus is the source of "menstrual flow".

Development

Uterus is developed by the fusion of the intermediate horizontal and the adjoining vertical part of the mullerian duct which begins at 7-8th week and complete at 12th week.

Situation

It lies at about the centre of pelvic cavity, between the urinary bladder in front and the rectum behind.

The adult uterus is a hollow pyriform or pear shaped, antero-posteriorly flattened organ.

Shape and Size

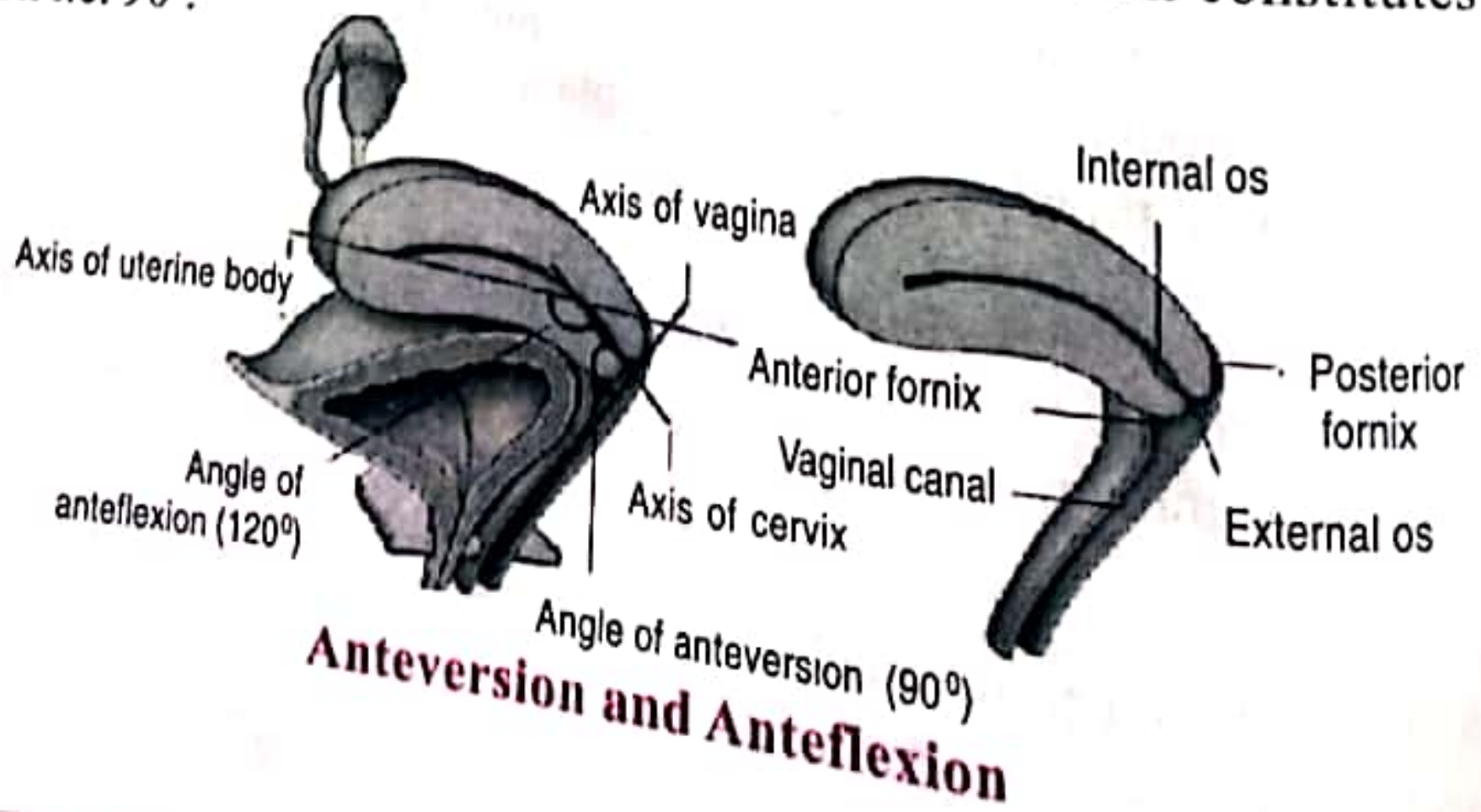
	Nulliparous woman	Parous woman
Size	7.5cm/3 inch	8.2 cm.
Legth		6.2 cm
Width a) at Fundus b) at cornua	2.5 cm/1 inch 5 cm/2 inch	
Each wall thickness a) at fundus b) at cornua	1.25 cm/1/2 inch 2.5 cm/1 inch	-
Weight	50 gm	70-80 gm

The uterus is larger in females who have recently been pregnant and smaller (atrophied) when sex hormone levels are low, as occurs after menopause.

Length of normal uterine cavity including the cervical canal is 7.5 to 8 cm. The cavity of uterus is triangular in shape when seen in longitudinal section, but is no more than a slit when seen in transverse section. It communicates with the vagina through the cervical canal and with the lumen of each fallopian tube at the cornua. In erect posture, the internal os lies on the upper border of the symphysis pubis and the external os lies at the level of ischial spines.

Position

The normal position of the uterus is anteversion and anteflexion. In about 15-20% normally the uterus remains in retroverted and retroflexed position. The Uterus is normally moderately mobile. The body of uterus is bent forward on the cervix approximately at the level of the internal os which constitutes angle of anteflexion i.e. 120°. The long axis of the uterus is bent forward on the long axis of vagina, against the urinary bladder, this is referred as anteversion of uterus which constitutes angle of anteversion i.e. 90°.

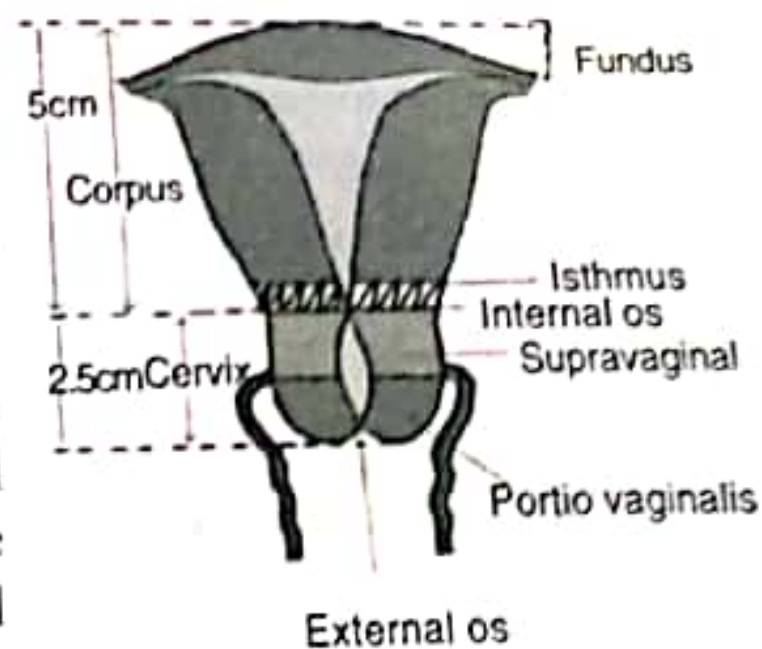


MI DUAL CAMERA

Parts of the uterus

Anatomical subdivisions of the uterus include :

- 1) A dome shaped portion superior to the uterine tubes called the Fundus.
- 2) A tapering central portion called the Body.
- 3) An inferior narrow portion called the Cervix that opens into the vagina.



Between the body of the uterus and the cervix is the Isthmus. The interior of the narrow cervix is called "Cervical canal". The cervical canal opens into uterine cavity at the internal os and into the vagina at the external os.

Body or Corpus

In the childbearing age, it forms about two thirds of the whole length of the uterus. It has thick muscular walls which is approximately 1 to 2 cm in thickness. A small triangular cavity enclosed within the walls of uterine body. Anterior and posterior walls of the cavity lie in approximation so that in a sagittal section it looks like a slit. The area where the fallopian tube is attached to the body of uterus is called Cornu of uterus. The area above the two cornua is called the fundus of the uterus and is convex upwards.

Histologically, the uterus consists of three layers of tissue :

- Perimetrium (Outer serous layer)
- Myometrium (Middle muscle layer)
- Endometrium (Inner mucous layer)

Perimetrium (Serous layer)

This is the outer most layer of the uterine wall. The serous layer covers the fundus, the anterior surface of the body, but does not cover the lateral borders.

Myometrium (Muscle Layer)

This is the middle layer of the uterine wall, consists of three layers of smooth muscle fibers and is thickest in the fundus and thinnest in the cervix. The thicker middle layer is circular, whereas the inner and outer layers are longitudinal or oblique.

Myometrium is developed from the mesoderm of the paramesonephric ducts.

The muscle fibres are arranged in three layers :

1. Outer longitudinal layer.
2. Middle vascular layer.
3. Inner circular layer.

1. **Longitudinal layer** : This is a thin layer running hood like from before backwards over the fundus and stops short at the internal os and does not cover the sides of the uterus where blood vessels enter. It converges at the uterine cornu on each side of the uterus to be continuous at the fallopian tube and round ligament.
2. **Vascular layer** : It forms the main bulk of the wall. The muscle fibres are disposed as figure of eight around the vessels and thus act as "Physiological living ligatures" to the myometrial vessels during their contractions. The purpose of this layer is therefore in part haemostatic, though its expulsive role is equally important.
3. **Circular layer** : It is present at all levels but chiefly develops at the tubal ostia and the internal os. It can be regarded as sphincteric in action.

Endometrium

It is a mucous membrane lining which forms the inner most layer of the uterine wall. Thickness of endometrium is variable and depends upon the phase of the menstrual cycle. During the post menstrual phase it is very thin, i.e. 1-3 mm but during the premenstrual phase it is thick and may measure 5-7 mm. In the premenstrual phase when it is thick, it can be divided into three layers as follows:

- **Compact layer** - the most superficial layer
- **Spongy layer** - the middle layer
- **Basal layer** - the deepest layer

The endometrial stroma is developed from the mesoderm of the paramesonephric ducts. The endometrial secretion is scanty and watery.

Vascular Connections

Arterial supply :

- (a) Uterine artery
- (b) Ovarian artery

Venous supply :

- (a) Pampiniform plexus in broad ligament
- (b) Uterine vein and ovarian vein
- (c) Vaginal plexus
- (d) Vertebral plexus

Nervous supply

The sympathetic components are from $T_5 - T_6$ (motor) and T_{10} to L_1 spinal segments (sensory). The Somatic distribution of uterine pain is that area of the abdomen supplied by T_{10} to L_1 .

The Parasympathetic system is represented on either side by the pelvic nerves which consists of both motor and sensory fibres from S₂, S₃ and S₄.

Isthmus

The isthmus is an annular zone of about 0.1 - 0.5 cm from top to bottom in the nulliparous uterus. It lies between the cervix and the corpus. The obvious constriction between the uterine cavity and the cervical canal is the "Anatomical Internal Os" and the isthmus is below to this. The mucous membrane of the isthmus is intermediate in structure and function between that of the corpus and that of the cervix. Its epithelial lining resembles and behaves like endometrium of the body.

Importance : During late pregnancy and labour along with the upper part of the cervix it forms the lower uterine segment.

Cervix

The cervix constitutes the lower one third of adult uterus, barrel shaped, measuring about 2.5 - 3.5 cm from above downwards.

The vaginal attachment at about the middle of the cervix divides it into the following parts :

- (a) Vaginal cervix or portio vaginalis
- (b) Supravaginal cervix.

The cervix has a narrow spindle shaped canal, which extends between the external and internal os and connects the uterine cavity with the vaginal canal. Its upper and lower ends are constricted and are called the internal and external os, respectively. In nulliparous women the external os is small and circular, it slits transversely in multiparous. The transformation zone is the area near squamo-columnar junction. The secretion of cervical glands is thick and alkaline, contain mucoprotein, fructose and sodium chloride.

The wall of cervix consists of two layers :

1. Mucous Membrane
2. Fibromuscular layer

1. Mucous Membrane : The cervical canal is lined by columnar epithelium which is thrown into crypts and folds. The cervical epithelium contains compound racemose glands, which are also lined by columnar epithelium. The glands produce an alkaline mucous secretion, which is rich in proteins and fructose. This secretion forms a plug in the cervical canal.

The columnar epithelium lining extends from the internal to the external os

(endocervix). The vaginal part of the cervix is covered by stratified squamous epithelium (exocervix).

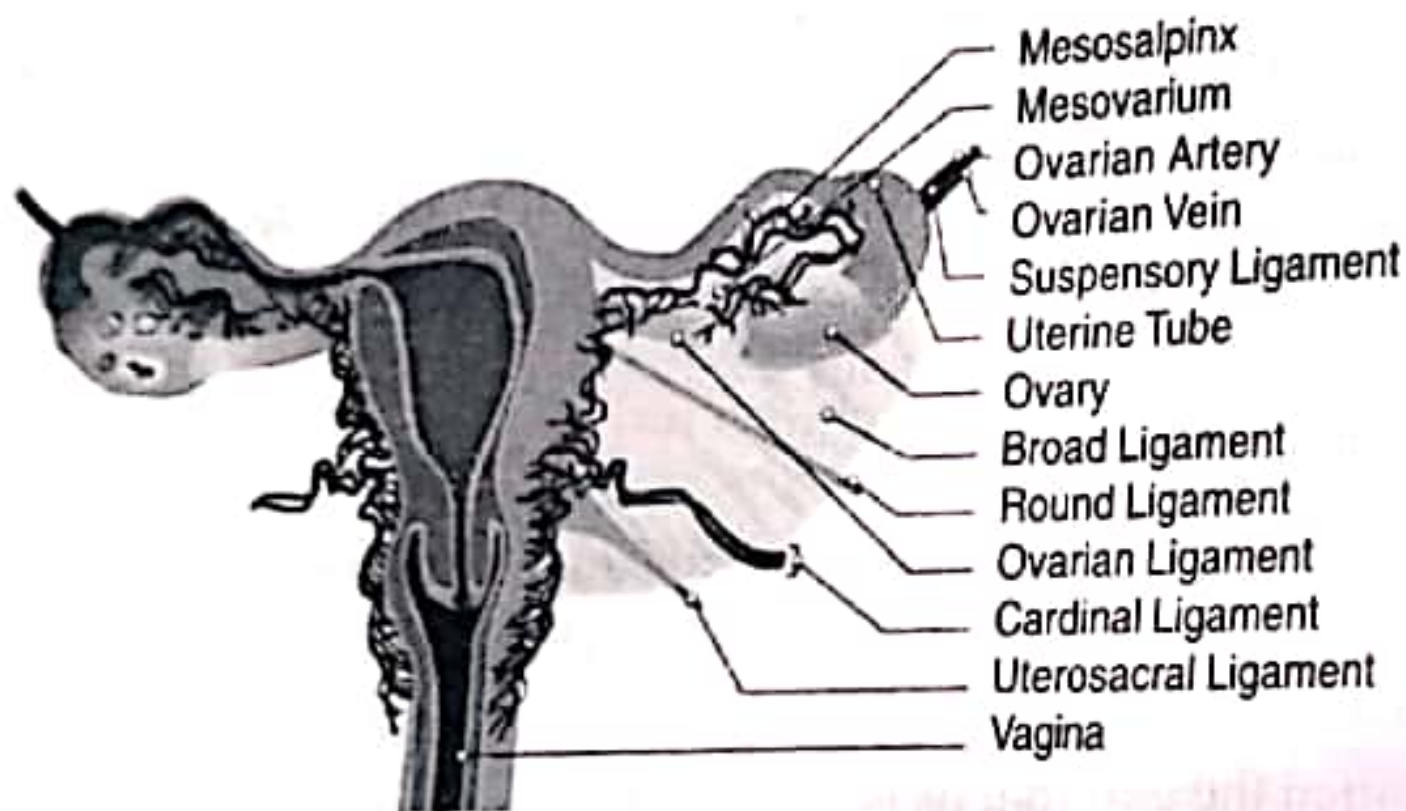
2. Fibromuscular layer: It consists mostly of fibrous tissue and is constricted at the internal os. There is no anatomical sphincter at this level. The muscle fibres are arranged as in the myometrium of the body of the uterus.

Development

Cervix is developed from the fused lower vertical parts of the two para-mesonephric ducts. The cervix is differentiated from the corpus by 10th week.

Supports of Uterus

The uterus is primarily supported by the pelvic diaphragm, perineal body and the urogenital diaphragm, secondarily, it is supported by ligaments.



Major ligaments of Uterus

It is held in place by several peritoneal ligaments, of which the following are the most important (there are two of each):

Name	From	To
Uterosacral ligament	Posterior cervix	Anterior face of sacrum
Cardinal ligament	Side of the cervix	Ischial spines
Pubocervical ligament	Side of the cervix	Pubic symphysis

Broad Ligament

The peritoneum surrounds the uterus like a flat sheet that folds over its fundus,

(endocervix). The vaginal part of the cervix is covered by stratified squamous epithelium (ectocervix).

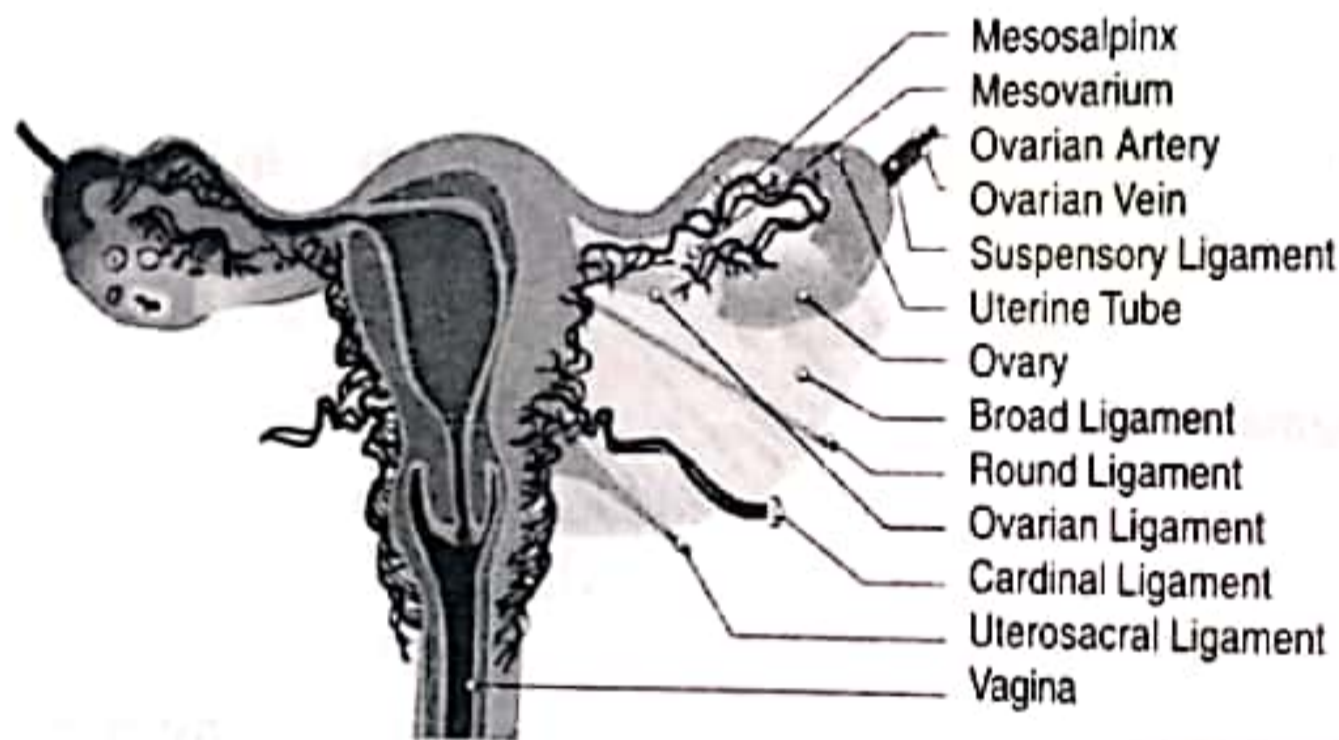
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Broad Ligament

The peritoneum surrounds the uterus like a flat sheet that folds over its fundus,

covering it anteriorly and posteriorly; on the sides of the uterus, this sheet of peritoneum comes in direct contact with itself, forming the double layer of peritoneum known as the broad ligament of the uterus.

It connects the sides of the uterus to the walls and floor of the pelvis.

The broad ligament may be divided into three subcomponents:

- Mesometrium – the mesentery of the uterus; the largest portion of the broad ligament
- Mesosalpinx – the mesentery of the fallopian tube
- Mesovarium – the mesentery of the ovaries.

The contents of the broad ligament include the following:

- Uterine tubes (or Fallopian tubes)
- Ovarian vessels (in the suspensory ligament)
- Uterine vessels
- Pelvic nerves
- Ureters
- Parametrial lymph node
- Ovarian ligament
- Round ligament of uterus
- Mackenrodt ligament
- Uterosacral ligament
- Epoophoron Paroophoron
- Gartner's duct

Function : The broad ligament serves as a mesentery for the uterus, ovaries, and the uterine tubes. It helps in maintaining the uterus in its position.

Round Ligament : The round ligament of the uterus originates at the uterine horns, in the parametrium. The round ligament exits the pelvis via the deep inguinal ring, passes through the inguinal canal and continues on to the labia majora where its fibers spread and mix with the tissue of the mons pubis.

Function : The function of the round ligament is maintenance of the anteversion of the uterus. When the uterus grows during pregnancy, the round ligaments can stretch causing pain.

Ovarian Ligament : They pass upwards & inwards from the inner poles the ovaries to reach the cornua of the uterus below the level of attachment of the fallopian tubes. They are morphologically continuation of the round ligament.

Fallopian Tubes or Uterine Tubes or Salpinges

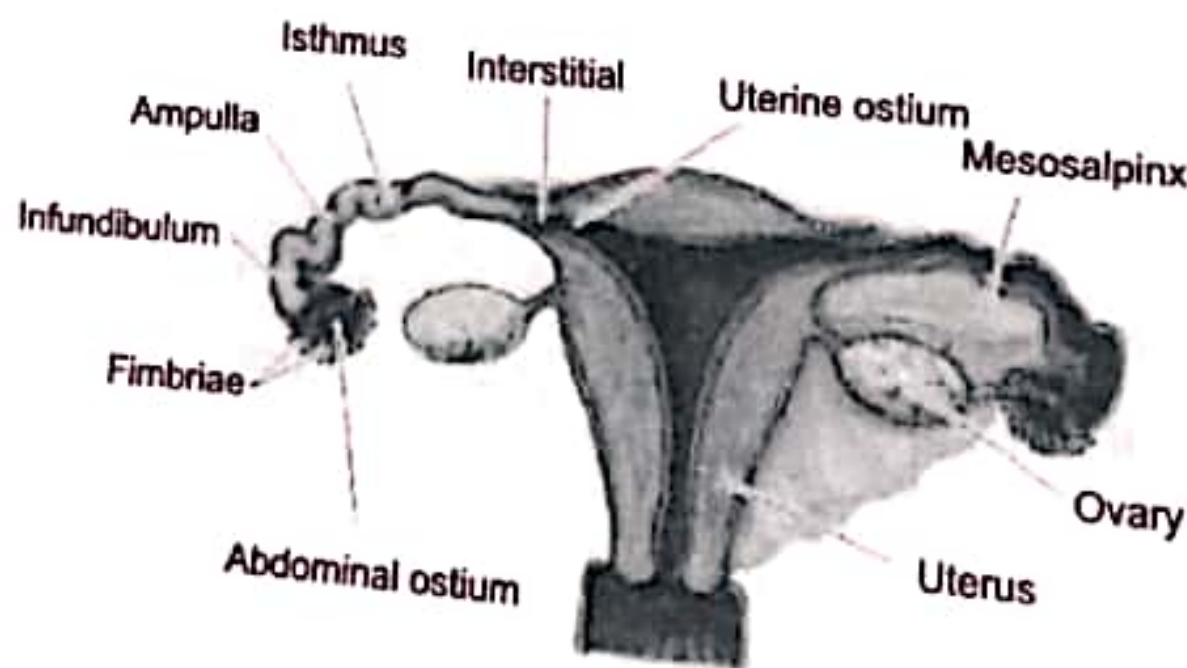
The Uterine tubes are paired structures which measure about 10 cm (4 inch). These are situated in the medial three fourth of the upper free margin of the broad ligaments. Each tube has two openings:

1. Uterine opening - It communicates with the lateral angle of the uterine cavity and measures 1 mm in diameter.
2. Pelvic opening or abdominal ostium - It is at the lateral end of the uterine tube and measures about 2 mm in diameter.

Parts

Each tube consists (medial to lateral)) of the following parts:

1. **Intramural or Interstitial** - Lies in the uterine wall and measures 1.25 cm (1/2 inch) in length and 1 mm in diameter.
2. **Isthmus** - Almost straight and measures about 2.5 cm (1 inch) in length and 2.5 mm in diameter.
3. **Ampulla** - Tortuous part and measures about 5 cm (2 inch) in length.
4. **Infundibulum** - Measures about 1.25 cm (1.2 inch) in length and diameter of 6 mm. The abdominal ostium is surrounded by a number of radiating fimbriae; one of these is longer than the rest and is attached to the outer pole of the ovary called "Ovarian fimbria".



Parts of fallopian tube

Structure

It consists of three layers :

1. Serous layer: Consists of the mesothelium of peritoneum on all sides except along the line of attachment of mesosalpinx.
2. Muscular layer: Consists of two layers-

Outer – longitudinal fibre

Inner – circular fibre

3. Mucous Membrane: It is thrown into folds or plicae. The epithelium of mucous membrane consists of three types of cells: the most common is ciliated, second one non-ciliated goblet shaped cells and third one small rod shaped cells called "Peg cells". There is no submucous layer or any glands. Changes occur in the tubal epithelium during menstrual cycle but are less pronounced and there is no shedding.

Development

The uterine tubes develop from the unfused parts of the paramesonephric ducts. The original points of invagination of the ducts into the coelomic epithelium remain as the abdominal openings of the tubes. Fimbrias are formed in this situation.

Functions

- (a) Transport of gametes
- (b) To facilitate fertilization
- (c) Secretes fluid for nutrition of spermatozoa, oocytes and zygote

Vascular connections

Arterial supply

- (a) Uterine Artery
- (b) Ovarian artery

Venous supply

- (a) Pampiniform plexus
- (b) Ovarian veins

Lymphatic supply

Para - aortic nodes

Nervous supply

- (a) Uterine nerves
- (b) Ovarian nerves

Ovary

These are paired sex glands or gonads in female and intraperitoneal structures. In nulliparae, the ovary lies in the ovarian fossa on the lateral pelvic wall. It is attached to the posterior layer of the broad ligament by the mesovarium, to the lateral pelvic wall by infundibulopelvic ligament and to the uterus by the ovarian ligament.

Size, Shape and Parts of the Ovary

It measures about 3 cm in length, 2 cm in breadth and 1 cm in the thickness, oval in shape and pinkish grey in colour and weights about 5-10 gm.

Each ovary presents two ends tubal and uterine, two borders mesoovarium and free posterior and two surfaces medial and lateral. The ovary is covered by single layer of cubical cells known as germinal epithelium.

The substance of the gland consists of outer cortex and inner medulla :

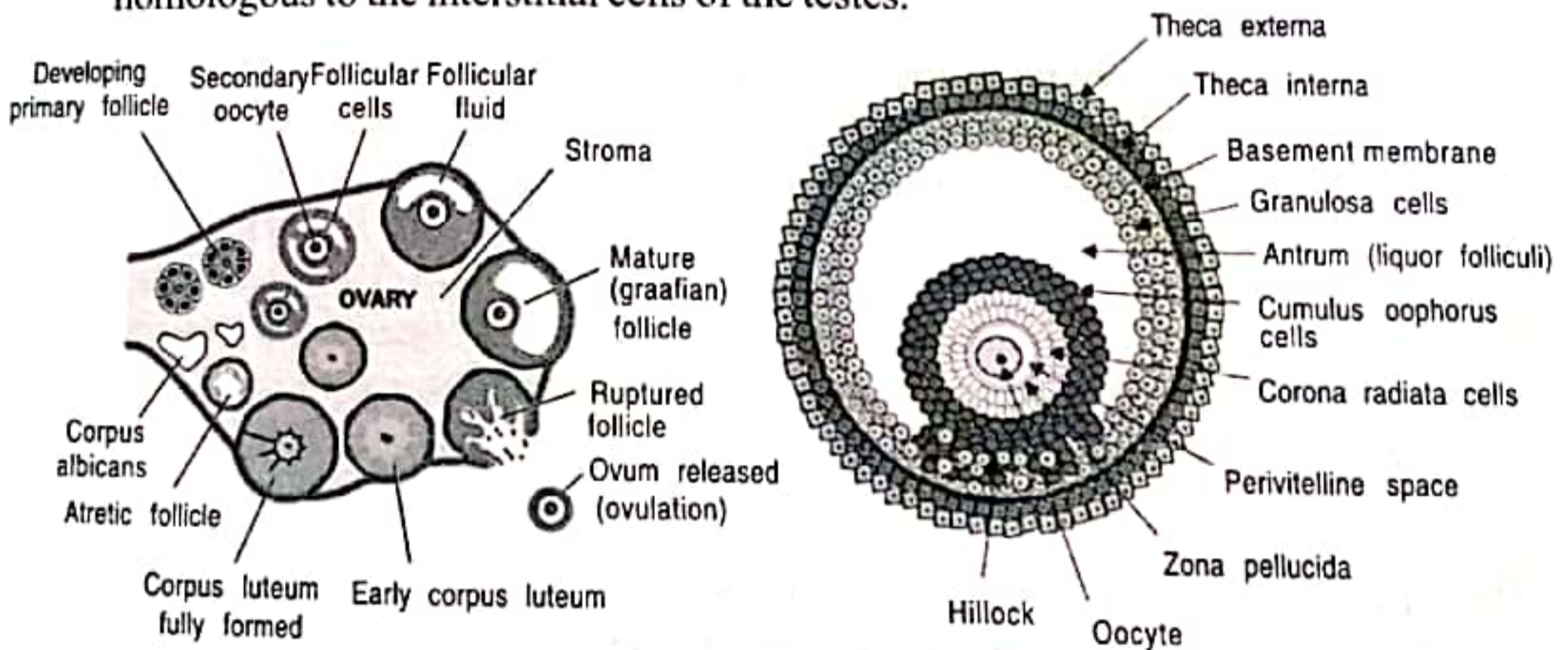
1) Cortex : It consists of stromal cells which are thickened beneath the germinal epithelium to form tunica albuginea. During reproductive period, the cortex is studded with numerous follicular structures called the "functional units of the ovary" in various phases of their development. These are related to sex hormone production and ovulation. The structures include primordial follicles, maturing follicles, graafian follicles and corpus luteum. Atresia of the structures results in formation of atretic follicles or corpus albicans. All forms of graafian follicles at different stages can be seen as:

- a. Primordial follicles:** Newborn ovaries contain about 2 million primordial follicles. At puberty 40,000 primordial follicles remain in ovaries and rest undergoes atresia. Around 400 follicles ovulate in 30 years of woman's reproductive life from puberty to menopause.
- b. Primary follicles:** Twenty in number grow in a menstrual cycle from primordial follicles in both ovaries. In the primary follicle a coat of poly saccharide develops around primary oocyte called zona pellucida. Granulosa cells proliferate around zona pellucida to form ovarian follicle. Around proliferating granulosa, cell layer develops a layer of vascular stromal layer called theca interna.
- c. Secondary follicle:** Develops with proliferated granulose cell mass around oocyte and formation of fluid filled spaces antrum follicali. Ovarian follicle with antrum is called graafian follicle.
- d. Tertiary follicle:** Single dominant follicle grows to 16.25 mm in size. The tertiary follicle contains:
 - Mature secondary oocyte is called ovum.
 - A mass of granulose cells grow around ovum is called discus proligerus. Granulosa cells lying close to ovum are arranged in radial fashion called corona radiata. Discus proligerus remain at one side of the antrum.
 - Wall of antrum is formed by layers of granulose cells – Membrana granulosa.
 - Theca interna – a vascular layer of ovarian stroma surrounding the cystic follicle.
 - Theca externa – a fibrous external layer surrounds the theca interna.

e. Granulosa cells in maturing graafian follicle develop receptors of follicle stimulating hormone (FSH) of anterior pituitary gland. FSH hormone causes proliferation of granulosa cells in ovarian follicle. The dominant follicle discharges ovum (ovulation) on the ovarian surface. Ovum is picked up by tubal fimbria and it gets fertilized by sperm at tubal ampulla. Oestrogen is secreted by graafian follicle. Corpus Luteum is formed out of shell of ruptured graafian follicle. Corpus Luteum matures on 19th day, retain its maturity for 26th day. It measures 1-2 cm and secretes progesterone. Normal functional life of corpus luteum is 12-14 days. If pregnancy does not occur, corpus luteum regresses on 27th or 28th day with falling of progesterone and oestradiol levels in blood. Corpus luteum finally degenerates to form hyaline mass called corpus albicans in the ovarian cortex.

f. The ovum gets disintegrated in fallopian tube within 24-48 hours if unfertilized. In pregnancy, corpus luteum is maintained as corpus luteum of pregnancy.

2) **Medulla** : It consists of loose connective tissues, few unstriped muscles, blood vessels and nerves. There is small collection of cells called "hilus cells" which are homologous to the interstitial cells of the testes.



Ovary

Mature Graafian Follicle

Development

They develop from the middle part of the genital ridge. The cortex and the covering epithelium develop from the coelomic epithelium and the medulla from the mesenchyme. The germ cells are endodermal in origin and migrate from the yolk sac to the genital ridge. The ovaries descend to the brim of the superior portion of the pelvic cavity.

Function

- (a) Germ cell maturation and storage
- (b) Ovulation

- (c) Steroidogenesis (sex hormone formation)
- d) Secretion of inhibin

Vascular connections

Arterial Supply

- (a) Ovarian artery

Venous supply

- (a) Pampiniform plexus
- (b) Ovarian vein

Lymphatic Supply

- (a) Aortic nodes
- (b) External iliac nodes

Nervous supply - Sympathetic supply comes down along the ovarian artery from T₁₀ segment. Ovaries are sensitive to manual squeezing.

Pelvic Floor

Soft tissues which fill the outlet of the pelvis is called pelvic floor. Through it passes the urethra, vagina and anal canal. Pelvic floor is mainly made up of muscular tissue but skin, fat, fascia and connective tissue go to form this structure which fills in the irregular-shaped pelvic outlet.

Muscles of Pelvic Floor

- Superficial muscles
- Deep muscles.

Superficial Muscles

The superficial layer is composed of five muscles :

- The external anal sphincter surrounding the anus.
- The transverse perineal muscles pass from the ischial tuberosities to the center of the perineum.
- The bulbo cavernous muscles pass from the perineum forward around the vagina.
- Ischio cavernous muscles pass from ischial tuberosities along the pubic arch.
- The membranous sphincter of the urethra is composed of muscle fibres passing above and below the urethra and attached to the pubic bones.

Deep Muscles

These are three pairs of muscles which together are known as the levator Ani muscles.

Each levator ani muscle consists of the following :

- The pubococcygeus muscle
- The iliococcygeus muscle
- The ischio coccygeus muscle

The levator ani muscle, by their mode of attachment to the pelvis, act like a sling or hammock. In front they are attached to the lateral part of the os pubis, behind to the ischeal spines and coccyx and laterally to the fascia. The three levator ani muscles meet to form a gutter which slopes forward and is perforated by three canals, i.e. urethra, vagina and rectum.

Functions of Pelvic Floor

- The pelvic floor supports the weight of abdominal and pelvic organs.
- Its muscles are responsible for voluntary control of micturition and defecation.
- Play an important part in sexual intercourse.
- During child birth it influences the passive movements of the foetus through the birth canal and relaxes to allow its exit from the pelvis.

Injury to Pelvic Floor During Labour

Under the influence of hormones the pelvic floor softens in preparation for labour during the last weeks of pregnancy. If the woman bears down during first stage of labour the paracervical tissue and transverse cervical ligaments will be subjected to excessive strain. The uterus may then sag downwards and become retroverted. The stress to which the pelvic floor is subjected during second stage of labour may be very great and if the second stage is unduly prolonged then the fascia supporting the bladder may become overstretched which results in subsequent prolapse of anterior vaginal wall forming a sac containing the bladder known as cystocele. When the head is on perineum for too long period, the excessive strain to this structure will give rise to a lax, sagging pelvic floor resulting in weak inadequate support to the pelvic organ.

Pelvic Fascia

The pelvic fascia are the fascia of the pelvis and can be divided into:

- a) The fascial sheaths of :
 - The Obturator internus muscle (Fascia of the Obturator internus)
 - The Piriformis muscle (Fascia of the Piriformis)
 - The pelvic floor
- b) Fascia associated with the organs of the pelvis.

Fascia of pelvic organs

Pelvic fascia extends to cover the organs within the pelvis.

Each levator ani muscle consists of the following :

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It is attached to the fascia that runs along the pelvic floor along the tendinous arch. The fascia which covers pelvic organs can be divided according to the organs that are covered:

- The front is known as the "vesical layer". It forms the anterior and lateral ligaments of the bladder.
- In males, its middle lamina crosses the floor of the pelvis between the rectum and vesiculae seminales as the rectovesical septum; in the female this is perforated by the cervix and is named the transverse cervical ligament.
- At the back, the fascia passes to the side of the rectum; it forms a loose sheath for the rectum, but is firmly attached around the anal canal. This portion is known as the "rectal layer".

Fascia of the pelvic floor

Superior : The part of the pelvic fascia on the pelvic floor covers both surfaces of the Levatores ani muscle.

The layer covering the upper surface of the pelvic diaphragm follows, above, the line of origin of the Levator ani and is therefore somewhat variable. In front it is attached to the back of the pubic symphysis about 2 cm above its lower border. It can then be traced laterally across the back of the superior ramus of the pubis for a distance of about 1.25 cm, when it reaches the obturator fascia.

It is attached to this fascia along a line which pursues a somewhat irregular course to the spine of the ischium. The irregularity of this line is because the origin of the Levator ani, which in lower forms is from the pelvic brim on the obturator fascia.

Tendinous fibers of origin of the muscle are therefore often found extending up toward, and in some cases reaching, the pelvic brim, and on these the fascia is carried.

Inferior : The diaphragmatic part of the pelvic fascia covers both surfaces of the Levatores ani. The inferior layer is known as the anal fascia. It is attached above to the obturator fascia along the line of origin of the Levator ani, while below it is continuous with the superior fascia of the urogenital diaphragm, and with the fascia on the sphincter ani internus.

Structure and Functions of Breasts or Mammary Glands

Breasts are very important accessory organs of reproduction. Breasts are the accessory glands. Breasts develop at puberty and lactation occur in response to high level of female hormones. The breasts are abundant with nerves and are sensitive to pressure.

The breast of a woman who has never given birth to a child are conic or hemispherical in form; shape and size vary among women and at different ages. The breasts of woman who has one or more babies tend to become pendulous. The tone of breast tissue after lactation has been terminated.

External Structure

The soft, smooth skin surface surrounding the circumference of the gland to the areola.

Areola : Pigmentation of the areolae varies from pink to brown. The surface of each areola is roughed by small, fine lumps of papillae known as montgomery's tubercles. Hormonal influences in pregnancy cause the areola to darken. Often this darkening is a presumptive sign of pregnancy in primigravida.

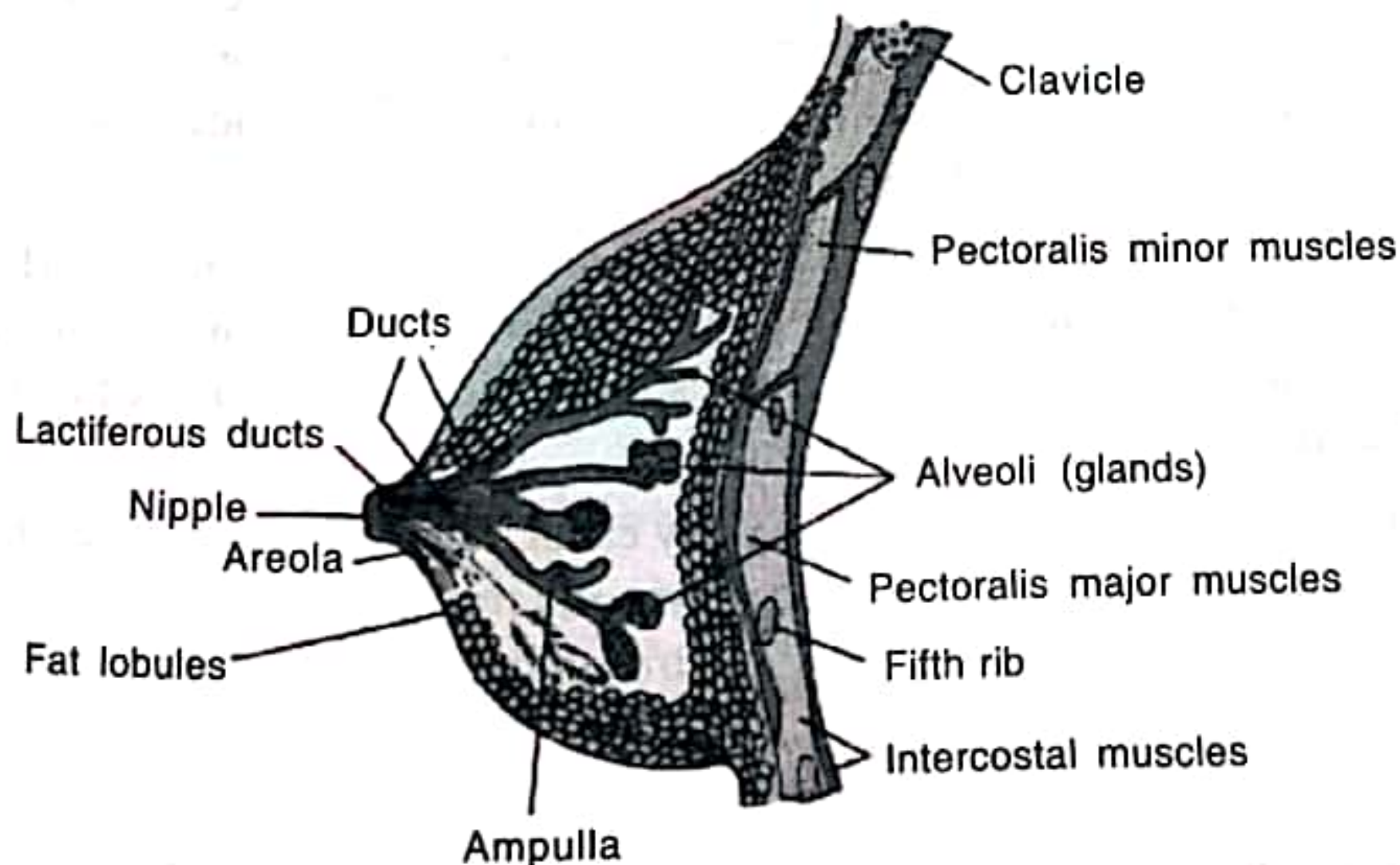
Nipple : The nipples are composed of sensitive erectile tissue. They form large, conic papilla projecting from the center of the areola. The openings of the milk ducts are the summit of each nipple.

Internal Structures

The breasts are composed of glandular tissue and fat. Each organ is divided into 15-20 lobes, which are separated by fibrous and fatty walls. Each lobe is subdivided into many lobules (alveolar glands) which contain numerous acini cells.

Acini cells comprise a single layer of epithelium, beneath which is a small amount of connective tissue richly supplied with capillaries. Milk secretion begins in the acini cells.

As the lactiferous ducts leading from the alveoli approach the nipple, they dilate to



Breast

form little reservoirs in which milk is stored. They narrow again as they pass into the nipple. Size of the breasts is not predictive to a woman's ability to produce adequate amounts of milk to nurse her infant successfully.

Vascular supply – Internal mammary and intercostals arteries.

Mammary veins follow these arteries.

Maternal Pelvis

The pelvis forms the base of the spine as well as the socket of the hip joint. The pelvic bones include the hip bones (innominate bones), sacrum and coccyx. These bones are united together by four joints- two sacroiliac joints, a sacro-coccygeal joint and a pubic symphysis.

The hip bones are composed of three sets of bones that fuse together as we grow older. Each set is nearly symmetrical across the body's midline. The parts of the hip bone are:

Ilium : This is the largest part of the hip bone. The crests of the ilium are what people typically consider their hips as they typically can be felt at the waist.

Pubis : This is at the front of the hip bone closest to the genitals. There is a joint between the two pubic bones called the pubic symphysis. In women, this becomes more flexible in late pregnancy to allow the foetal head to pass through during delivery.

Ischium : Below the ilium and next to the pubis, this circular bone creates the lowest portion of the hip bone. This is where the femur meets the pelvis to create the hip joint.

The **sacrum** is a triangular bone wedged into the rear section of the pelvis. It is made up of five fused vertebral bones. The female sacrum is shorter and wider than a male's. The sacrum is connected to the tailbone, or coccyx, which is made of several fused vertebral bones at the base of the spine.

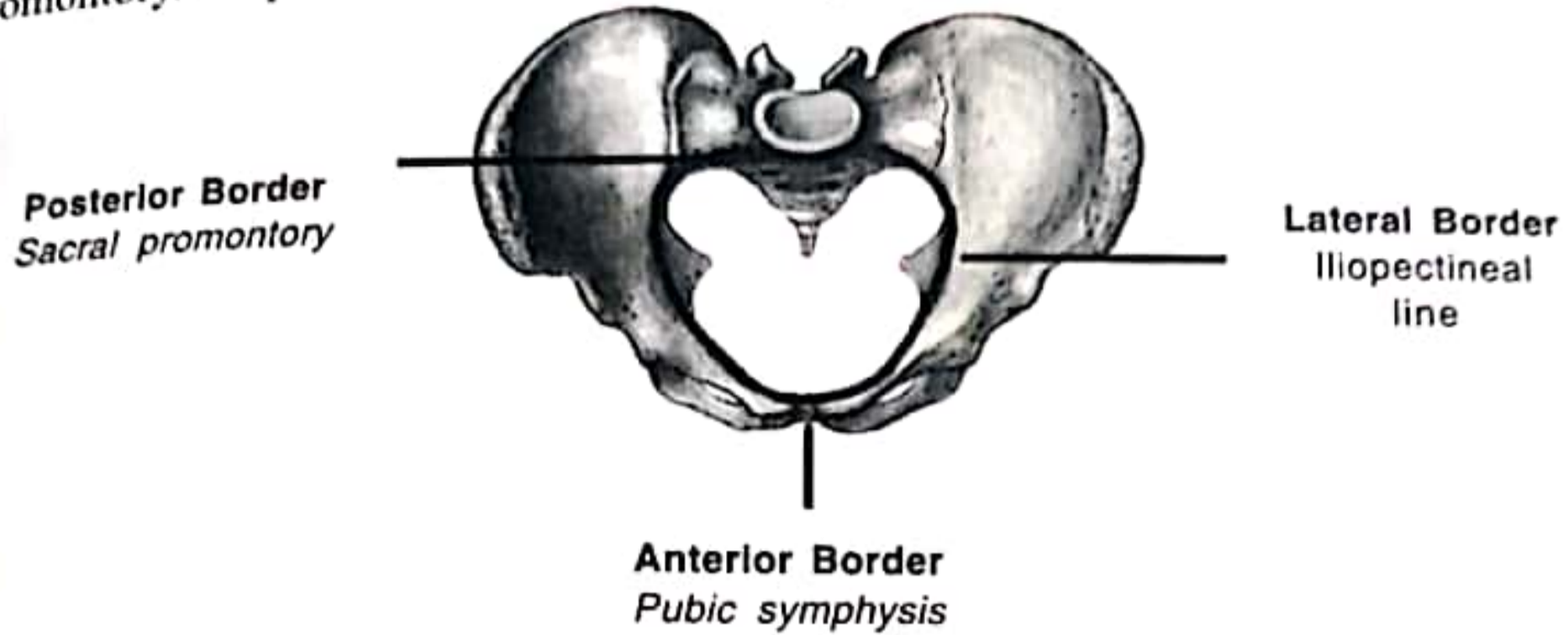
The female pelvic bones are typically larger and broader than a male's. This is so a foetus can pass through the pubic outlet, the circular hole in the middle of the pelvic bones, during childbirth. The pubic arch, or space under the base of the pelvis, is also wider for this reason.

The maternal passage consists of the bony canal with soft structures lining it. The pelvis is anatomically divided into false pelvis and true pelvis, the maternal passage concerned with labour is the true pelvis. The true pelvis consists of the following three parts:

1. Pelvic brim
2. Pelvic cavity
3. Pelvic outlet

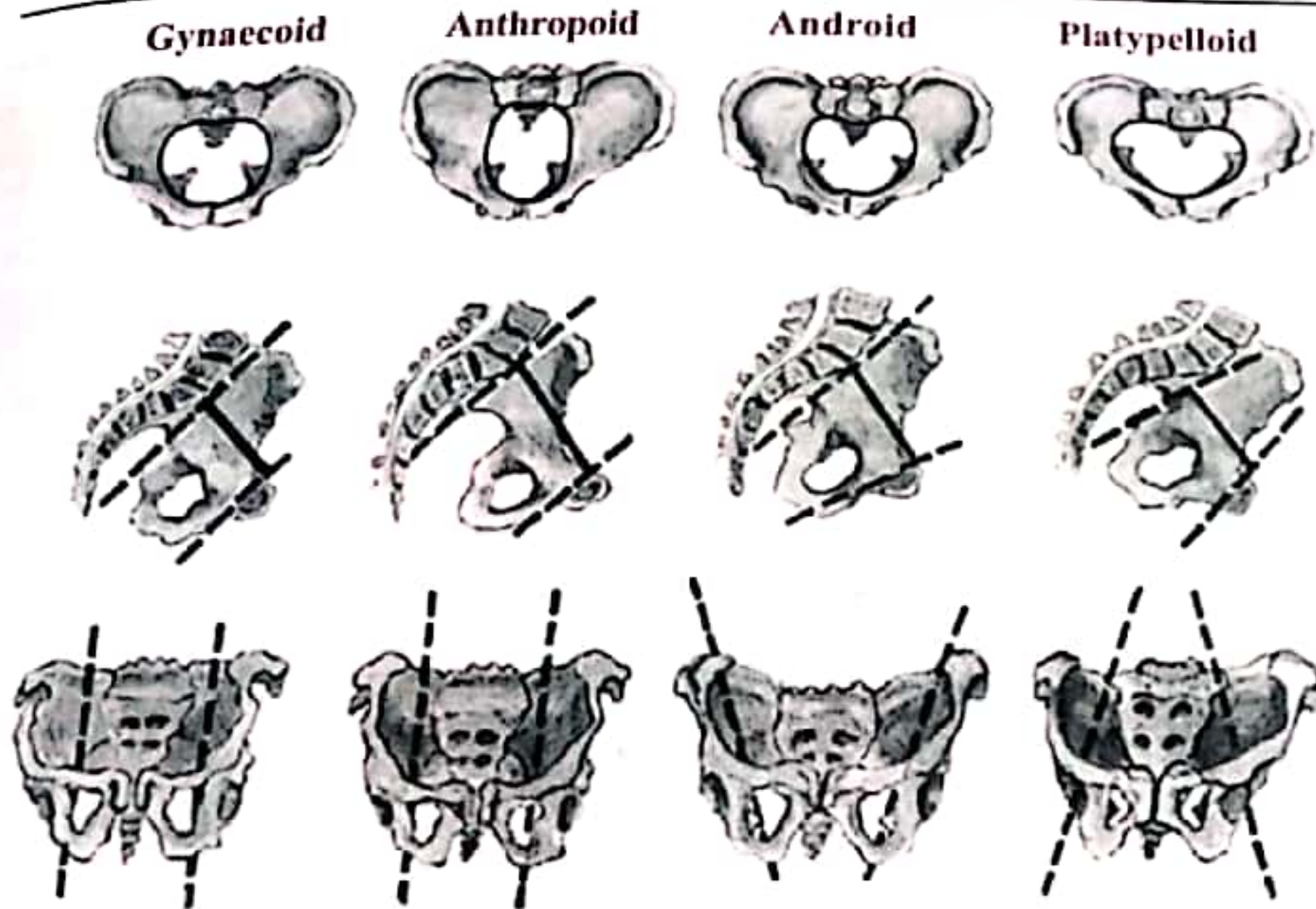
Pelvic Brim

It is also known as pelvic inlet or upper pelvic straight. Brim is bounded anteriorly by the posterior margin of superior surface of pubic symphysis, laterally by iliopectineal eminences and iliopectineal lines and posteriorly by margins of alae of sacrum and sacral promontory. Shape of the brim is transversely oval.



The diameters of pelvic brim are given below:

Diameters	Measurement	Description
Antero-posterior Diameter or True Conjugate	11 cm	From the centre of sacral promontory behind to the centre of posterior margin of superior surface of the pubis
Right Oblique Diameter	12 cm	From right sacroiliac joint to the iliopectineal eminence on opposite side
Left Oblique Diameter	12 cm	From left sacroiliac joint to the iliopectineal eminence on opposite side
Transverse Diameter	13 cm	The distance between the two farthest points in the pelvic brim. It is not a true diameter as it does not pass through the centre
Obstetric Conjugate	10 cm	From the centre of sacral promontory behind to the nearest point on the posterior surface of the pubic symphysis in front. This is the antero posterior diameter available for the passage of foetus at the brim. By subtracting 1.5-2



- The delivery of foetal head through gynaecoid and anthropoid pelvis has equal mechanical problems. If it is easy at brim, it is easy in cavity and outlet.
- The delivery of foetal head through android pelvis gives increasing problems when it descends further.
- The delivery of foetal head through platypelloid pelvis meets problems at the brim but thereafter, the difficulties decrease with descent.

Other Pelvic Variations

High assimilation pelvis (where 5th lumbar vertebra is fused to sacrum), deformed pelvis due to developmental anomalies; dietary deficiency like rickets, osteomalacia; diseases like poliomyelitis, TB of hip joints and lower spine, and injury may cause deformed pelvis.

1. **Rachitic flat pelvis** : It is disease of early childhood when bones are soft and unossified, when child lies or sits, changes occurs in soft pelvis due to weight bearing. The shape of inlet is reniform with marked shortening of antero-posterior diameter of inlet and widening of transverse diameter of outlet and pubic arch.
2. **Oestiomalacic pelvis** : It is the disease of maturity when softening of pubic bones occurs due to calcium and vitamin D deficiency and lack of exposure to sunrays. The

		cms from diagonal conjugate appropriate length of obstetric conjugate can be obtained.
Diagonal Conjugate	12 cm	Extends from middle of sacral promontory to middle of lower border of symphysis pubis. This diameter can be measured on the patient if sacral promontory is reached.
Posterior Sagittal Diameter	4.5 cm	The segment of antero-posterior diameter behind the intersection of the transverse diameter

The plane of the pelvic brim is inclined at an acute angle to the horizontal. This angle is the angle of inclination and measures about 55 degree. The axis of pelvic brim is an imaginary straight line drawn perpendicular to the plane of pelvic brim at its centre. The foetus enters the brim in the direction of the axis of the brim.

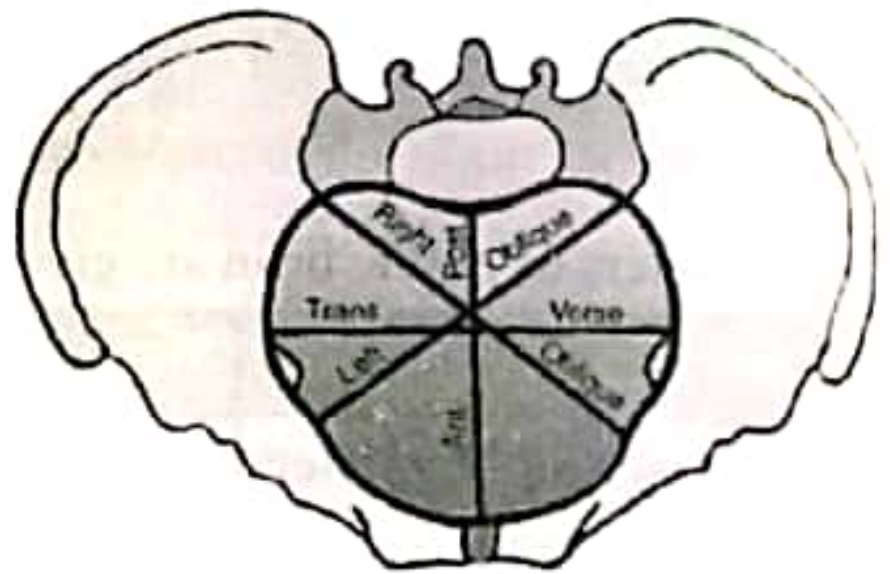
Pelvic Cavity

It is the space between the brim above and plane of least pelvic dimensions below. It forms a curved canal having shallow anterior wall and a deep posterior wall. Depth of anterior wall is 4 cms and posterior wall (Curve of sacrum) is 12 cms. Diameters of the cavity are expressed at one plane-the plane of the greatest pelvic dimensions. The plane of the greatest pelvic dimension is bounded by middle of pubic symphysis anteriorly passing through obturator foramen and greater sciatic notch laterally to the junction of 2nd and 3rd sacral vertebra posteriorly.

It is round in shape, most roomy plane of pelvis and its diameter is 12 cm. The axis of the mid pelvic plane (plane of greatest pelvic dimensions) is the imaginary line passing perpendicular through the centre of the plane, the direction is almost downwards.

Pelvic Outlet

This is bounded above by the plane of least pelvic dimensions (narrow pelvic plane) and by the anatomical outlet of the pelvis below. This segment has posterior and two lateral walls but has deficient anterior wall below the pubic arch. Its shape is antero-posteriorly oval.



The outlet diameters are expressed at two levels:

1. Obstetric outlet
2. Anatomic outlet

The obstetric outlet or plane of narrow pelvic dimension

The plane of least pelvic dimension is bounded anteriorly by lower margin of pubic symphysis, laterally by ischeal spines and posteriorly by the tip of the sacrum. Axis of obstetric outlet is the imaginary perpendicular line passing through centre of plane of least pelvic dimension.

The diameters of this plane are as follows:

Diameters	Measurement	Description
Antero-posterior diameter	11 cm	The distance from the middle of lower border of pubic symphysis to the tip of the sacrum.
Transverse diameter (interspinous diameter)	10.5 cm	The distance between the two ischial spines. It is the shortest pelvic diameter.
Posterior sagital diameter	5 cm	Narrow pelvic plane is from the centre of the interspinous diameter to the tip of the sacrum.

Anatomic outlet

It is bounded anteriorly by pelvic arch, laterally by ischio-pubic rami, ischeal tuberosity, sacrosciatic ligaments and posterrioly by the tip of sacrum (tip of coccyx if it is fused). Hence, it is lozenge or diamond shaped.

The diameters of this plane are as follows:

Diameters	Measurement	Description
Antero-posterior diameter	13 cm (during 2 nd stage of labour)	The distance from the middle of lower border of pubic symphysis to the tip of the coccyx.
Transverse diameter (intertuberous diameter)	11 cm	The distance between inner borders of ischial tuberosities.
Posterior sagital diameter	8.5 cm	It is the antero-posterior distance between sacrococcygeal joint and the midpoint of transverse diameter of outlet.

	Antero-posterior	Oblique	Transverse
Brim	11	12	13
Cavity	12	12	12
Outlet	13	12	11

Curve of carus or the anatomical axis of the pelvis is a line uniting centres of the plane of the brim, plane of the cavity and outlet. It is a curved line with concavity forward. It represents the true path of the foetal head through maternal pelvis. Decrease in 1 cm or more in any of the diameters of pelvis is considered as contracted pelvis.

Types of the Pelvis

Female Pelvis is divided into four parent types based on the shape of inlet. The shape of female pelvis is very important from gynaecological point of view. The anatomical shape of the female pelvis should be suitable for the passage of baby through it. Otherwise, baby may get stuck inside the pelvis that may make vaginal delivery difficult.

Four types of pelvis are Gynaecoid (50%), Anthropoid (25%), Android (20%) and Platypelloid (5%). In many cases pelvis is of mixed type and there may be 14 types of pelvis.

Anatomical features of four types of pelvis:

Features	Gynaecoid	Anthropoid	Android	Platypelloid
Brim	Rounded or Heart shaped	Anteroposterior oval	Triangular	Transverse oval
Sacrum	Well curved	Well curved	Flat	Flat
Fore pelvis	Generous	Narrow	Narrow	Wide
Side wall	Straight	Straight/ divergent	Convergent	Divergent
Ischeal spines	Blunt	Blunt	Prominent	Blunt
Sacrosciatic notch	Rounded, wide	Wide	Narrow	Wide
Sub pubic angle	90°	<90°	<90°	>90°
Incidence	50%	25%	20%	5%

shape of inlet is triradiate. The ideal mode of delivery should be caesarean section.

3. **Naegele's pelvis** : It is produced due to developmental arrest of one ala of the sacrum. The pelvis is contracted at all level but more marked in the outlet. The method of delivery is caesarean section.
4. **Robert's pelvis** : Ala of both the sides of sacrum is absent and the sacrum is fused with the innominate bones. It is an extremely rare deformity. The method of delivery is caesarean section.
5. **Scoliotic pelvis** : Lumbar scoliosis may cause this deformity. There is oblique asymmetry of the pelvis resulted in contraction of one of the oblique diameters. The method of delivery is caesarean section.
6. **Kyphotic pelvis** : This deformity is secondary to kyphotic changes of the vertebral column due to TB or rickets. There is extreme funnelling of the pelvis. The method of delivery is caesarean section.

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रजोविज्ञान

संहिताओं में रजःसाव और स्त्रीबीज के लिए रक्त, लोहित, असृक, शोणित, रज, आर्तव, रुधिर, पुष्य एवं बीज इत्यादि अनेक शब्दों का प्रयोग किया गया है।

रज

रज की उत्पत्ति

रसात् स्तन्यं ततो रक्तं.....॥

(च.सं.चि. 15/17)

रक्तमपि रजसंज्ञं रसादेव प्रसादभागजन्यम्॥

(चक्र., च.सं.चि. 15/17)

- रज/रक्त की उत्पत्ति रस से होती है।
- रस के प्रसाद भाग से ही रज संज्ञक रक्त की उत्पत्ति हुई है।

रसादेव स्त्रिया रक्तं रजःसंज्ञं प्रवर्तते ॥ (सु.सं.सू. 14/6)

रस से ही स्त्रियों में रजःसंज्ञक रक्त प्रवर्तित होता है।

तथा रक्तमेव च स्त्रीणां मासे मासे गर्भकोष्मनुप्राप्य त्र्यहं प्रवर्तमानमार्तवमित्याहुः ।

(अ.सं.शा. 1/10)

मासि मासि रजः स्त्रीणां रसजं स्रवति त्र्यहम् । (अ.ह.शा. 1/7)

जो रक्त स्त्रियों में प्रतिमास गर्भाशय में आकर तीन दिन स्रवित होता रहता है, उसे आर्तव कहते हैं।

टीकाकार अरुणदत्त ने रज को रक्त का पर्याय माना है एवं उसकी उत्पत्ति आहाररस से माना है न कि रसधातु से।

महत्वपूर्ण—

- क) आचार्य चरक, सुश्रुत, अष्टाङ्गहृदयकार ने रस से रज की उत्पत्ति माना है।
- ख) चक्रपाणि ने रस के प्रसादभाग से रज की उत्पत्ति माना है।
- ग) अष्टाङ्गसंग्रहकार, भावमिश्र एवं शार्ङ्गधर ने रक्त से रज की उत्पत्ति माना है।
- घ) अरुणदत्त ने आहार रस से रज की उत्पत्ति बताया है।
- ड) हारीत के अनुसार स्त्रियों का रज बिना किसी योग के ही होता है।

रजःस्राव प्रारम्भ का कारण

हीनयोन्यास्तु बालायाः काय गच्छति शोणितम् ।
अथ पूर्णस्वभावायाः कायं योनिं च गच्छति ॥

(का.सं.सू. 9/19)

बालिकाओं की योनि स्वल्प होने के कारण उनका सम्पूर्ण रक्त शरीर में चला जाता है तथा जिस स्त्री के शारीरिक अवयव पूर्ण हो चुके हैं उनका रक्त शरीर एवं योनि दोनों में जाता है।

परिपूर्णधातु शरीरास्तु यदा भवन्ति तदा विवेकजललोहितं मासे मासे प्रतिवेदयन्ति । (भे.सं.शा. 5/6)
महर्षि भेल ने शरीर की धातुओं की परिपूर्णता को ही प्रतिमास विवेकजललोहित अर्थात् रजःस्राव का कारण बताया है।

प्रथम रजोदर्शन एवं रजोनिवृत्ति की आयु

तद् वर्षाद् द्वादशादूर्ध्वं याति पञ्चाशतः क्षयम् । (सु.सं.सू. 14/6)
योषितश्चोनद्वादशातीत पञ्चाशद्वर्षाया रजस्तन्याद्य इति । (अ.सं.शा. 1/21)

आचार्य सुश्रुत, वाग्भटद्वय, भावमिश्र ने स्त्रियों में 12 वर्ष की आयु से रजःस्राव प्रारम्भ होकर 50 वर्ष की आयु में समाप्त होना बताया है। साथ ही भावमिश्र ने तरुणावस्था में शुक्र का प्रादुर्भाव तथा स्त्रियों में रोमराजी, स्तन्य नद आर्तव की उत्पत्ति बताया है।

षोडशवर्षयोहि शोणितशुक्रयोर्मध्ये प्रभवतः; अर्वांगपि यदाहारविशेषादारोग्याच्च पूर्णे भवत इति परिषत् ॥ (का.सं.शा. 5/4)

महर्षि काश्यप ने शोणित एवं शुक्र का प्रादुर्भाव काल 16 वर्ष माना है। साथ ही यह भी बताया है कि विशेष आहार एवं आरोग्य के प्रभाव से यह शोणित एवं शुक्र आयु के पूर्व भी उत्पन्न हो सकते हैं।

आचार्य अरुणदत्त ने रजोदर्शन की प्रारम्भिक आयु 12 वर्ष माना है। साथ ही 11 वर्ष में भी रजःस्राव हो सकता है ऐसा बताया है तथा रजोनिवृत्ति की आयु 50 वर्ष माना है।

रज का परिमाण

स्त्रीणां रजसोऽञ्जलयश्चत्वारः ॥ (अ.सं.शा. 5/98)

चत्वारो रजसः स्त्रियाः ॥ (अ.ह.शा. 3/81)

स्त्रियों में रज का परिमाण 4 अंजली होता है।

आर्तव**आर्तव का स्वरूप एवं कर्म**

आर्तवं शोणितं त्वाग्रेयम् । (सु.सं.सू. 14/7)

रक्तलक्षणमार्तवं गर्भकृच्च । (सु.सं.सू. 15/9)

आर्तवमाग्नेयम्। (सु.सं.शा. 3/2)

आर्तव आग्नेय (अग्निमहाभूतप्रधान), रक्त के लक्षणों वाला एवं गर्भ की उत्पत्ति करने वाला होता है। आचार्य इन्द्रगोप के अनुसार आर्तव का कर्म जीवनसंज्ञक अर्थात् रक्त के कर्म के समान कर्म भी है।

स्त्रीणांगर्भोपयोगि स्यादात्तवं सर्वसम्पत्तम् ।
तासामपि बलं वर्णं शुक्रं पुष्टिं करोति हि ॥
एतेन स्त्रीणां सप्तमो धातुरार्तवं शुक्रमष्टममिति बोधितम् ।
आशयाधिक्यवत् ॥

(भा.प्र.पूर्व. 3/188)

आचार्य भावमिश्र ने बताया है कि स्त्रियों में एक आशय (गर्भाशय) अधिक होने के कारण आर्तव मानवी तथा शुक्र आठवीं धातु होती है। स्त्रियों में गर्भोपयोगी समस्त कार्य आर्तव द्वारा सम्पन्न होते हैं एवं बल तथा वर्ण की पुष्टि शुक्र के द्वारा होती है।

शुद्ध आर्तव का स्वरूप

आचार्य चरक के अनुसार—

मासान्निपिच्छदाहार्ति पञ्चरात्रानुबन्धि च ।
नैवातिबहु नात्यल्पमार्तवं शुद्धमादिशेत् ॥
गुञ्जाफलसवर्णं च पद्मालक्तकसन्निभम् ।
इन्द्रगोपकसङ्काशमार्तवं शुद्धमादिशेत् ॥

(च.सं.चि. 30/225-226)

- जो एक मास के अन्तराल पर आये
- पिच्छिलता, दाह एवं वेदना रहित हो
- लगातार पाँच रात्रि तक स्रवित होने वाला हो
- प्रमाण में न तो बहुत कम, न बहुत अधिक हो
- वर्ण में गुञ्जाफल, कमल के पुष्प या इन्द्रगोप के सदृश लाल वर्ण का हो उसे शुद्ध आर्तव कहते हैं।

आचार्य सुश्रुत एवं वाग्भटद्वय के अनुसार—

शशासृक्प्रतिमं यत्तु यद्वा लाक्षारसोपमम् ।
तदारत्तवं प्रशंसन्ति यद्वासो न विरञ्जयेत् ॥

(सु.सं.शा. 2/19)

आर्तवं पुनः शशरुधिर लाक्षारसोपमं धीतं च विरज्यमानं शुद्धमाहुः ।

(अ.सं.शा. 1/20)

.....आर्तवं पुनः । लाक्षारसशशास्त्राभं धौतं यच्च विरज्यते ।

(अ.ह.शा. 1/17-18)

- शशक (खरगोश) के रक्त या लाक्षारस के सदृश लाल वर्ण का।
 - कपड़े को रंजित न करे अथवा धोने पर कपड़े से रंग छुट जाये।
- योगरत्नाकर, माधव एवं भावमिश्र ने भी आचार्य चरक एवं सुश्रुत के मत का ही अनुकरण किया है।

आर्तव निर्माण की प्रक्रिया

मासेनोपचितं काले धमनीभ्यां तदार्तवम् ।
ईषत् कृष्णं विवर्णं च वायुर्योनिमुखं नयेत् ॥

(सु.सं.शा. 3/8)

मासेनोपचितं रक्तं धमनीभ्यामृतौ पुनः ।
ईषत्कृष्णं विगन्धं च वायुर्योनिमुखाद्भुदेत् ॥

(अ.सं.शा. 1/43, अ.ह.शा. 1/22-23)

रजोवहाः सिरा यस्मिन् रजः प्रविसृजन्त्यतः ।
पुष्पभूतं हि तद्दैवान्मासि मासि प्रवर्तते ॥

(का.सं.खि. 9/17)

काल अर्थात् 12 वर्ष के ऊपर और 50 या 60 वर्ष के पूर्व समय (आचार्य डल्हणानुसार) में एक मास में संचित आर्तव को दो धमनियों द्वारा वायु योनिद्वार की ओर ले जाता है। वह आर्तव कुछ काला और विवर्ण अथवा विशिष्ट गन्ध युक्त होता है।

आचार्य कश्यप के अनुसार रज पुष्प के रूप में रजोवहा शिराओं द्वारा दैव के प्रभाव से प्रत्येक मास में निकलता है।

स्त्री शुक्र

यदा नार्यावुपेयातां वृषस्यन्त्यौ कथञ्चन ।
मुञ्चन्त्यौ शुक्रमन्योऽन्यमनस्थिस्तत्र जायते ॥

(सु.सं.शा. 2/50)

जब दो नारी अत्यन्त कामादिभूत होकर मैथुन करें तथा किसी भी प्रकार से एक का शुक्र दूसरे में परस्पर जाता है उससे जो गर्भ उत्पन्न होता है वह अनस्थि अथवा कोमलास्थियुक्त (डल्हणानुसार) होता है।

योषितोऽपि स्रवन्त्येव शुक्रं पुंसः समागमे ।
गर्भस्य तन्न किञ्चित्तु करोतीति न चिन्त्यते ॥

(अ.सं.शा. 1/72)

स्त्रियाँ भी पुरुष के साथ समागम करते समय शुक्र का क्षरण करती हैं। परन्तु यह शुक्र गर्भ स्थिति में कोई भाग नहीं लेता है।

इसी प्रकार का वर्णन आचार्य भावमिश्र एवं टीकाकार अरुणदत्त ने भी किया है। महर्षि हारीत ने भी संभोग के समय स्त्री द्वारा शुक्र विसर्ग का वर्णन किया है।

स खलु त्रीणि त्रीणि कलासहस्राणि पञ्चदश च कला एकैकस्मिन् धाताववतिष्ठते । एवं मासेन रसः शुक्नीभवति स्त्रीणां चार्तवम् ॥

अष्टादशसहस्राणि सङ्ख्या ह्यस्मिन् समुच्चये । कलानां नवतिः.....॥ (सु.सं.शा. 14/14,15)

रस 3015 कला तक एक धातु में रुकता है। इस प्रकार एक मास में रस पुरुषों में वीर्य तथा स्त्रियों में आर्तव के रूप में परिणत होता है। इस रस से शुक्र बनने में 18090 कला समय लगता है।

आचार्य डल्हण ने यहाँ आर्तव शब्द से शुक्र या स्त्रीशुक्र अर्थ किया है न कि रज।

अत्र आर्तवशब्दोऽयं शुक्रे वर्तते न तु रजसि, रजो हि रसाद्रक्तवत् सप्तमेऽहनि जायते; अथवा यद्यमार्तव शब्दः शुक्रे न वर्तते तदाऽत्र शुक्रोत्पत्त्यधिकारे स्त्रीणां शुक्रस्यानुक्तत्वात् षड्धातुत्वं स्यात्, तस्मात् आर्तवशब्दः शुक्रे वर्तते । (डल्हण, सु.सं.सू. 14/14)

आचार्य डल्हण ने रस से शुक्र और आर्तव के उत्पत्ति प्रकरण में आर्तव शब्द से स्त्रियों में शुक्र अर्थ लिया है न कि रज का, क्योंकि रज तो रस धातु से सात रात्रि में ही उत्पन्न हो जाता है तथा आर्तव शब्द से शुक्र का ग्रहण नहीं किया जायेगा तो स्त्रियों में 6 धातुओं की उपस्थिति हो पाएगी। अतः यहाँ आर्तव शब्द से शुक्र ही लेना चाहिए। स्त्री शुक्र भी गर्भजननशक्ति युक्त होता है।

शुक्रवह स्रोतस के मूल बताते हुए आचार्य सुश्रुत एव अष्टांग संग्रह ने स्तनौ (अर्थात् दो स्तन) बताए हैं। इससे भी शरीर व्यापित शुक्र की स्थिति स्त्री शरीर में होती है, यह प्रतीत होता है।

शुक्रवहे द्वे, तयोर्मूलं स्तनौ वृषणौ च । (सु.सं.शा. 9/12)

.....शरीरे शुक्रधरां कलामाश्रित्य सर्वाङ्गव्यापितया स्थितं विशेषतश्च मज्ज मुष्कस्तनेषु॥

(अं.सं.शा. 1/7)

शुक्रवाहिनां स्तनौ मुष्कौ मज्जा च । (अ.सं.शा. 6/43)

शुक्र की स्थिति सर्वशरीर होते हुए विशेष रूप से मज्जा, मुष्क एवं स्तन है तथा दो शुक्रवह स्रोतसों के मूल दो स्तन, दो वृषण, मुष्क एवं मज्जा है।

यहाँ स्तन शब्द के प्रयोग से ऐसा प्रतीत होता है कि स्त्री शरीर में भी शुक्र की उपस्थिति होती है।

ऋतुचक्र

ऋतुचक्र की अवधि सामान्यतः एक चन्द्रमास (28 दिन) बताई गई है एवं इसे स्पष्टतः तीन भागों में विभक्त किया गया है—

1. रजः स्रावकाल - 3 या 5 दिन

2. ऋतुकाल - 12 या 16 दिन

3. ऋतुव्यतीत काल - 9 या 13 दिन

1. रजः स्रावकाल—सभी आचार्यों के अनुसार, रजःस्राव एक-एक मास के अन्तराल पर होता है परन्तु रजःस्राव की अवधि भिन्न-भिन्न बताई गई है।

आचार्य चरक - 5 रात्रि (च.स.चि. 30/225)

आचार्य वाग्भट द्वय - 3 दिन (अ.स.शा. 1/10, अ.ह.शा. 1/7)

आचार्य भावमिश्र - 3 दिन (भा.प्र.पू. 3/204), 5 रात्रि (भा.प्र.चि. 68/10)

आचार्य हारीत - 7 दिन (हा.सं.षष्ठ स्थान 1/8)

आचार्य भेल - 7 रात्रि (भे.सं.शा. 5/5)

आचार्य भावमिश्र ने “पञ्चरात्रानुबन्धि” के स्पष्टीकरण में कहा है कि अत्यधिक रक्त प्रवृत्ति होने पर तीन दिन, मध्यम प्रवृत्ति होने पर पाँच दिन एवं किसी-किसी को स्वल्प स्राव होने पर सोलह दिन तक शुद्ध रक्त का स्राव होता है।

महर्षि भेल ने 3 दिन तक होने वाले रजःस्राव को “पुराण रुधिर” की संज्ञा दी है।

2. ऋतुकाल—आचार्य डल्हणानुसार, जिस काल में स्त्री-पुरुष के संयोग से अपत्यफल (गर्भ) की प्राप्ति होती है उस विशेष काल को ऋतुकाल कहते हैं।

ऋतुस्तु द्वादशरात्रं भवति दृष्टार्तवः । अदृष्टार्तवाऽप्यस्तीत्येके भाषन्ते ॥ (सु.सं.शा. 3/5)

ऋतुस्तु दृष्टार्तवो द्वादशरात्रं भवति । षोडशरात्रमित्यन्ये । शुद्धयोनिगर्भाशयार्तवाया मासमपि तु केचित् ।
(अ.सं.शा. 1/40)

ऋतुस्तु द्वादशनिशा.....। (अ.ह.शा. 1/27)

ऋतुकाल आर्तव-दर्शन के बाद 12 दिन होता है। अन्य आचार्यों के मत से आर्तव दर्शन न होने पर भी स्त्री को ऋतुकाल होता है।

अष्टांग संग्रहाकार ने अन्य मत से 16 दिन तक ऋतुकाल तथा शुद्ध योनि, गर्भाशय और आर्तव के होने तक एक मास तक ऋतु होती है ऐसा बताया है।

द्वादशरात्रमिति षोडशदिनेषु मध्ये आद्यं दिनत्रयमन्तिमं च षोडशं योनिसंकोचदिनं न गणनीयम् ॥

(डल्हण, सु.सं.शा. 3/5)

आचार्य डल्हण ने 16 दिन में से आदि के 3 दिन एवं अन्तिम 16वाँ दिन का योनि संकोच के कारण गिनती नहीं किया है। इस प्रकार 12 दिन का ऋतुकाल बताया गया है।

टीकाकार इन्दु ने निषिक्त बीज के फल स्वरूप उत्पन्न होने के कारण इसे ऋतुकाल कहा है।

आर्तवस्रावदिवसादृतुः

गर्भग्रहणयोग्य

स

एव

षोडश

समयः

रात्रयः ।

स्मृतः ॥

(भा.प्र. पूर्व 3/2)

आर्तवस्त्राव के दिन से 16 दिन तक ऋतुकाल होता है और यही समय गर्भ ग्रहण योग्य होता है। आचार्य काश्यप एवं भावमिश्र ने वर्ण के अनुसार, ऋतुकाल बताया है—

वर्ण	का.सं.शा. 5/5	भा.प्र. पूर्व 3/2
ब्राह्मणी	12 दिन	12 दिन
क्षत्रियाणी	11 दिन	10 दिन
वैश्या	10 दिन	8 दिन
अन्य/(शुद्र-भा.प्र.)	9 दिन	6 दिन

महत्वपूर्ण— ऋतुकाल

- आचार्य चरक ने नहीं बताया है।
- आचार्य सुश्रुत - 12 दिन
- वृद्ध वाग्भट - 12 दिन, अन्य मत से 16 दिन
- वाग्भट - 12 दिन
- डल्हण - 12 दिन
- भावमिश्र - 16 दिन (गर्भग्रहणयोग्यकाल)
- काश्यप एवं भावमिश्र 'वर्ण' के अनुसार ऋतुकाल।

ऋतुकाल में ही गर्भाधान होने का कारण

नियतं दिवसेऽतीते सङ्कुचत्यम्बुजं यथा ।
ऋतौ व्यतीते नार्यास्तु योनिः संव्रियते तथा ॥

(सु.सं.शा. 3/7)

पद्मं सङ्कोचमायाति दिनेऽतीते यथा तथा ।
ऋतावतीते योनिः सा शुक्रं नान्तः प्रतीच्छति ॥

(अ.सं.शा. 1/42, अ.ह.शा. 1/21-22)

जिस प्रकार दिन के अन्त होने पर कमलपुष्प संकुचित हो जाता है उसी प्रकार ऋतुकाल के व्यतीत हो जाने पर स्त्री की योनि संकुचित हो जाती है एवं शुक्र का अंतःभाग में ग्रहण नहीं करती।

आचार्य भावमिश्र ने भी ऋतुकाल के बाद योनि का संकुचित होना बताया है। आचार्य भेल ने भी ऋतुकाल में ही गर्भाधान होना बताया है।

ऋतुकाल के उत्तरोत्तर रात्रियों में गर्भाधान से लाभ

एषूत्तरोत्तरं विद्यादायुरारोग्यमेव च ।
प्रजासौभाग्यमैश्वर्यं बलं च दिवसेषु वै ॥

(सु.सं.शा. 2/31)

तासूत्तरोत्तरमायुरारोग्यैश्वर्यसौभाग्यबलवर्णेन्द्रियसम्पदपत्यस्य भवति ।

(अ.सं.शा. 1/49)

ऋतुकाल की उत्तरोत्तर दिनों में गर्भाधान से उत्पन्न बालक में आयु, आरोग्य, सौभाग्य, ऐश्वर्य एवं बल की अधिकाधिक प्राप्ति होती है।

आचार्य वृद्धवाग्भट ने आयु आदि के साथ वर्ण और इन्द्रियसम्पद भी कहा है।

3. ऋतुव्यतीत काल

ऋतौ व्यतीते नार्यास्तु योनिः संव्रियते तथा ॥

(सु.सं.शा. 3/7)

28 दिन के ऋतुचक्र में ऋतुकाल के बाद की अवधि को ऋतुव्यतीत काल कहते हैं। इसका स्पष्ट उल्लेख संहिताओं में नहीं मिलता है केवल "योनि का संकुचित" होना बताया गया है जिससे योनि शुक्र का ग्रहण नहीं करती है।

ऋतुव्यतीत काल में गर्भाधान का परिणाम

अतः परं तूत्तरोत्तरमेवायुरादीनां हासः। (अ.सं.शा. 1/49)

अत ऊर्ध्वमकालजमाहुः । अकालजं हीनं दुर्बलमस्थिरमदृढमपीनभङ्गुरं धान्यमिव भवति ॥

(का.सं.शा. 5/5)

इसके बाद (अर्थात् 12 दिन के बाद) उत्तरोत्तर काल में गर्भाधान होने पर आयु-आरोग्य आदि का हास होता है। 12 दिन के अतिरिक्त समय "अकाल" कहलाता है एवं इस अकाल में स्थित गर्भ अकाल में होने वाले धान्य के समान हीन गुणों वाला, दुर्बल, अस्थिर, अशुद्ध, पतला एवं भंगुर होता है।

ऋतुचक्र में दोषों की प्रधानता

काल	अवधि	दोष प्रधान्य
1. रजःस्रावकाल	3-5 दिन	वातोल्वण
2. ऋतुकाल	12-16 दिन	कफोल्वण
3. ऋतुव्यतीत काल	9-13 दिन	पित्तोल्वण

रजःस्वला चर्या

मासिक रजःस्राव के काल में स्त्री रजःस्वला कही जाती है एवं रजःस्रावकाल में स्त्री द्वारा पालन किये जाने वाले नियमों का वर्णन सभी आचार्यों ने रजःस्वलाचर्या के अन्तर्गत किया है।

आचार्य चरक के अनुसार—

ततः पुष्यात् प्रभृति त्रिरात्रमासीत ब्रह्मचारिण्यधःशायिनी, पाणिभ्यामन्नमजर्जरपात्राद्भुञ्जाना, न च काञ्चिन्मृजामापद्येत । ततश्चतुर्थेऽहन्येनामुत्साद्य सशिरस्कं स्नापयित्वा शुक्लानि वासांस्याच्छादयेत् पुरुषं

च । ततः शुक्लवाससौ स्रग्विणी सुमनसावन्योऽन्यमभिकामौ संवसेयातां स्नानात् प्रभृति युग्मेष्वहः सु पुत्रकामौ, अयुग्मेषु दुहितुकामौ ॥ (च.सं.शा. 8/5)

- रजःस्राव के दिन से लेकर 3 दिन तक ब्रह्मचारिणी रहे अर्थात् अष्टमैथुन का परित्याग करते हुए ब्रह्मचर्य के पूरे नियमों का पालन करें एवं भूमि पर शयन करें।
- हाथ में अजर्जर (बिना टूटे) पात्र में अन्न भोजन करें।
- किसी प्रकार से शरीर की शुद्धि न करें।
- चौथे दिन शरीर में उबटन लगाकर सिर से स्नान करके शुक्लवस्त्र का धारण करें और पुरुष भी शुक्लवस्त्र का धारण करें।
- स्त्री-पुरुष दोनों श्वेतवस्त्र एवं पुष्पमाला धारण कर, प्रसन्न मन से एक-दूसरे से मिलने की इच्छा वाले हों तब पुत्र की इच्छा से युग्म दिनों में तथा कन्या की इच्छा से अयुग्म दिनों में मैथुन करें।

आचार्य सुश्रुत के अनुसार—

ऋतौ प्रथमदिवसात् प्रभृति ब्रह्मचारिणी.....। दर्भसंस्तरशायिनीं करतलशरावपर्णान्यतमभोजिनीं हविष्यं, त्र्यहं च भर्तृः संरक्षेत् । ततः शुद्ध स्नातां चतुर्थेऽहन्यहतवासां समलङ्कृतां कृतमङ्गल-स्वस्तिवाचनां भर्तारं दर्शयेत् ॥ (सु.सं.शा. 2/26-27)

- प्रथम दिन से ही ब्रह्मचारिणी रहें।
- दर्भ (कुश) से बने बिस्तर पर सोयें।
- दिवास्वप्न, अञ्जन, अश्रुपात, स्नान, अनुलेपन, अभ्यंग, नखकर्तन, धावन, हसन, अधिक बोलना, अधिक शब्द श्रवण, अवलेखन (केश प्रसाधन), वायु एवं अत्यधिक परिश्रम का परित्याग करें।
- करतल (हथेली) या शराव (मिट्टी के बर्तन) या पर्ण (पत्ते) पर हविष्य (घृत के साथ शालि ओदन या क्षीर संस्कृत यवान्न-डल्हण) भोजन करें।
- तीन दिन तक पति से पृथक् रहें।
- चौथे दिन "शुद्ध स्नाता" स्त्री नवीन वस्त्र एवं आभूषणादि धारण कर मंगलाचरण एवं स्वस्तिवाचन के बाद पति का दर्शन करे।

आचार्य डल्हण ने बताया है कि जीर्ण शोणित के चले जाने एवं नये शोणित के अवस्थित होने से स्त्री शुद्ध हो जाती है।

वाग्भट के अनुसार—

ततः पुष्पदर्शने प्रथमदिवसात्प्रभृति ब्रह्मचारिणी.....
यावकं पयसा सिद्धमल्पं कर्शनार्थमशनीयात् ॥

(अ.सं.शा. 1/44)

ततः पुष्पेक्षणादेव कल्याणध्यायिनी त्र्यहम् ।
मृजालङ्काररहिता दर्भसंस्तरशायिनी ॥
क्षैरेयं यावकं स्तोत्रं कोष्ठशोधनकर्षणम् ।

पर्णे शरावे हस्ते वा भुञ्जीत ब्रह्मचारिणी ॥

(अ.द्व.शा. 1/23-25)

वृद्ध वाग्भट ने भोजन में यावक को दूध से लिप्त कर अल्पमात्रा में शरीर-कर्शनार्थ सेवन बताया है। वाग्भट ने दूध सिद्ध यावक अल्पमात्रा में सेवन शरीर-कर्शनार्थ एवं कोष्ठशोधनार्थ बताया है। साथ ही 3 दिन तक कल्याणध्यायिनी (हितसेवन और अहितत्याग) रहने को कहा है। अन्य सभी तथ्य वाग्भटद्वय ने आचार्य सुश्रुत के सदृश ही बताए हैं।

आचार्य कश्यप के अनुसार चौथे दिन स्नान से शुद्ध स्त्री स्नान गृह में श्वेत या अन्य शुक्ल वस्त्र से स्वयं को ढककर इधर-उधर न देखती हुई पवित्र मन से देवगृह में जाकर प्रज्ज्वलित तथा हवन की हुई अग्नि की घृत तथा अक्षत द्राग पूजा करें। ब्राह्मण, ईश्वर, विष्णु तथा स्कन्द को देखकर तथा उनका अभिवादन करके, सूर्य एवं चन्द्रमा को नमस्कार करें। वह प्रेत, पिशाच तथा राक्षस आदि को नमस्कार न करें।

आचार्य भावमिश्र ने महर्षि सुश्रुत के सदृश ही वर्णन किया है।

महत्वपूर्ण— रजःस्वला चर्या— 3 दिन (सभी आचार्यों द्वारा)

चरक, वृद्ध वाग्भट	→	ब्रह्मचारिणी
वाग्भट	→	कल्याणध्यायिनी, ब्रह्मचारिणी
चरक	→	अधः शायिनी
सुश्रुत, वाग्भटद्वय	→	दर्भ संस्तरशायिनी
सुश्रुत	→	हविष्य भोजन
वाग्भटद्वय	→	यावक पयसा सिद्ध भोजन

रजःस्वला हेतु निषिद्ध कर्म एवं निषेध के न पालन से हानि

दिवा स्वपन्त्याः स्वापशीलः, अञ्जनादन्धः, रोदनाद्विकृतदृष्टिः, स्नानानुलेपनाद् दुःखशीलः, तैलाभ्यङ्गात् कुष्ठी, नखापकर्तनात् कुनखी, प्रधावनाच्चञ्चलः, हसनाच्छ्यावदन्तौष्ठतालुजिह्वः, प्रलापी चातिकथनाद् अतिशब्दश्रवणाद्धिः, अवलेखनात् खलतिः, मारुतायाससेवनादुन्मत्तो गर्भो भवतीत्येवमेतान् परिहरेत् ॥

(सु.सं.शा. 2/26)

रजःस्वला हेतु वर्ज्य कर्म	वर्ज्य सेवन से उत्पन्न गर्भ में विकृति
दिवास्वप्न	→ स्वापशील
अञ्जन	→ अन्ध
रोदन	→ विकृत दृष्टि
स्नान, अनुलेपन	→ दुःखशील
तैलाभ्यंग	→ कुष्ठी
नखकर्तन	→ कुनखी
प्रधावन	→ चंचल
हसन	→ श्यावदन्त-ओष्ठ-तालु-जिह्वा

अतिकथन (बहुत बोलना)	→	प्रलापी
अतिशब्द श्रवण	→	बधिर
अवलेखन (केशसंमार्जन)	→	खलति (खालित्य)
मारुत-आयास सेवन	→	उन्मत्त

आचार्य भावमिश्र ने पूर्णरूपेण आचार्य सुश्रुत का पालन किया है केवल अवलेखन के स्थान पर "भूमिखनन" एवं उसके "स्खलन" (चलते-चलते लड़खड़ाकर गिर जाना) विकृति बताया है। साथ ही निषिद्ध कर्म के पालन से प्रकुपित कर्म में विकृति उत्पन्न करते हैं ऐसा वर्णन किया है।

आचार्य	रजःस्वला के निषिद्ध कर्म
वृद्ध वाग्भट →	स्वेदन, तीक्ष्ण, उष्ण, अम्ल, लवण
वाग्भट →	स्वेदन, शरीर-शुद्धि, अलंकार
काश्यप →	नस्य, वमन
डल्हण →	नस्य

.....रजःस्वलाया ऋतुर्व्यापद्यते.....। (का.सं.सि. 4/6)

आचार्य काश्यप के मत से रजस्वला को नस्य देने से ऋतु (आर्तव) सम्बन्धी व्याधियाँ हो जाती हैं एवं इसकी चिकित्सा पुष्पाध्याय, यूषाध्याय आदि अध्यायों में कही हुई औषधियों अथवा दूध से सिद्ध जीवनीय औषधियों से करने के लिए बताया है।

रजःस्राव के समय मैथुन का परिणाम

तत्र प्रथमे दिवसे ऋतुमत्यां मैथुनगमनमनायुष्यं पुंसां भवति, यश्च तत्राधीयते गर्भः स प्रसवमानोविमुच्यते ('प्राणैः' पा.)। द्वितीयेऽप्येवं सूतिकागृहे वा, तृतीयेऽप्यवमसम्पूर्णाङ्गोऽल्पायुर्वा भवति। चतुर्थे तु सम्पूर्णाङ्गो दीर्घायुश्च भवति। न च प्रवर्त्तमाने रक्ते बीजं प्रविष्टं गुणकरं भवति, यथा नद्यां प्रतिस्त्रोतः प्लाविद्रव्यं प्रक्षिप्तं प्रतिनिवर्त्तते नोर्ध्वं गच्छति तद्वतेतद् द्रष्टव्यम्। तस्मान्नियमवतीं त्रिरात्रं परिहरेत्। अतः परं मासादुपेयात् ॥ (सु.सं.शा. 2/33)

रजस्वलायाश्चेत् प्रथमेऽहनि गर्भं आपद्येत तं वातगर्भमाचक्षते विफलं वातपुष्पमिवोद्भिदानां; द्वितीयेऽहनि चेत् संस्रते च्यवते वा; तृतीयेऽहनि सूतिकासने म्रियते, न वा दीर्घायुर्भवति, हीनाङ्गश्च जायते। (का.सं.शा. 5/5)

मैथुन दिवस	आचार्य सुश्रुत	आचार्य काश्यप
प्रथम दिन	अनायुष्य पुरुष, गर्भ के प्रसव के बाद तुरन्त मृत्यु	वातगर्भ, विफल (फलशून्य)
द्वितीय दिन	सूतिकागृह में बालक की मृत्यु	संस्रते च्यवते (गर्भस्राव)
तृतीय दिन	बालक असम्पूर्ण अंगयुक्त एवं अल्पायु	बालक की सूतिकागृह में मृत्यु; हीनांगयुक्त, अल्पायु
चतुर्थ दिन	बालक सम्पूर्णांग, दीर्घायु	-

आचार्य वृद्धवाग्भट के मत से प्रथम 3 दिन में स्थापित गर्भ का कुक्षि में ही विनाश हो जाता है अथवा बालक अल्पायु, अल्पबल, अल्पारोग्य वाला एवं विकलेन्द्रिय होता है।

आचार्य भावमिश्र ने सुश्रुत के मत का अनुकरण करते हुए वर्ज्य अंगों वाली (अर्थात् मैथुन हेतु निषिद्ध) स्त्रियों का वर्णन करते हुए बताया है कि वह स्त्री प्रथम दिन चण्डाली सदृश, दूसरे दिन ब्रह्मघातिनी सदृश एवं तीसरे दिन रजकी सदृश होती है तथा रजस्वला-गमन से पुरुष की दृष्टि, आयु एवं तेज की हानि तथा अधर्म होता है।

रजःस्त्राव के चतुर्थ दिवस में पति-दर्शन या अन्य प्रिय कार्य का परिणाम

पूर्व पश्येदतुस्नाता यादृशं नरमङ्गना ।
तादृशं जनयेत् पुत्रं भर्तारं दर्शयेदतः ॥ (सु.सं.शा. 2/28)

तदा हि यादृशमेव पश्यति चिन्तयति वा तादृशं प्रसूत इति ॥ (अ.सं.शा. 1/46)

शुद्धस्नातमात्रा हि स्त्री यं वा पश्यति मनसा वाऽभिध्यायति तादृशाचारवपुषं प्रायेण जनयति;
तस्माद्देवगोब्राह्मणगुरुवृद्धाचार्यान् सतः पश्येत् कल्याणमनाश्च स्यात् । (का.सं.शा. 5/7)

- ऋतुस्नाता स्त्री सर्वप्रथम जिस प्रकार के पुरुष को देखेगी वैसे ही पुत्र को जन्म देगी इसीलिए पहले उसे पति का ही दर्शन करना चाहिए।
- आचार्य वृद्धवाग्भट के मत से स्त्री जैसे पुरुष को देखती है अथवा जैसा चिन्तन करती है, वैसा ही सन्तान को उत्पन्न करती है।
- काश्यप के अनुसार शुद्ध-स्नाता स्त्री सर्वप्रथम जिसे देखती है अथवा जिसका ध्यान करती है उसी के आचार एवं शरीर वाली सन्तान को जन्म देती है। अतः वह सर्वप्रथम देवता, गो, ब्राह्मण, गुरु, वृद्ध, आचार्य का दर्शन करें तथा कल्याणयुक्त मन वाली रहे।
- महर्षि हारीत के अनुसार सप्त धातुओं के बल से भी प्रकृति और विकृति जब सम हो जाते हैं तो ऋतुव्याप्त रज से स्त्रियों की जो भावना होती है अर्थात् सात्विक, राजसी या तामसी उसी प्रकार के गुण वाले बालक को जन्म देती है। उस काल में स्त्री अपने मन में जिसका विचार करती है भाई, पिता या अन्य कोई पुरुष उसी के समान पुत्र को उत्पन्न करती है।
- आचार्य भावमिश्र ने पति के अतिरिक्त अन्य प्रियजन अर्थात् पुत्र आदि के दर्शन का निर्देश दिया है।

ऋतुमती

सप्तरात्राद्योनिशुद्धिस्तस्माद्ऋतुमती भवेत् ॥ (हा.सं. षष्ठस्थान 1/9)

महर्षि हारीत के मत से सात रात्रि के बाद योनि शुद्धि होती है तब स्त्रियाँ ऋतुमती कही जाती हैं।

ऋतुमती के लक्षण

गते पुराणे रजसि नवे चावस्थिते शुद्धस्नातां स्त्रियमव्यापन्नयोनिशोणितगर्भाशयामृतुमतीमाचक्ष्महे ।
(च.सं.शा. 4/7)

पुराना रज जो एक मास से संञ्चित रहता है उसके निकल जाने के बाद और नूतन रज के गर्भाशय में स्थित होने पर पुनः शुद्ध होकर स्नान की हुई स्त्री जिसकी योनि, आर्तव और गर्भाशय दूषित न हो ऋतुमती कहलाती है।

पीनप्रसन्नवदनां		प्रविलग्नान्नात्ममुखद्विजाम् ।
नरकामां	प्रियकथां	स्वस्तकुक्ष्यक्षिमूर्धजाम् ॥
स्फुरद्भुजकुचश्रोणिनाभ्यूरुजघनस्फिचाम्		
हर्षोत्सुक्यपरां	चापि	विद्यादृतुमतीमिति ॥ (मु.सं.शा. 3/5-6)
क्षामप्रसन्नवदनां		स्फुरच्छ्रोणिपयोधराम् ।
स्वस्ताक्षिकुक्षिं	पुंस्कामां	विद्यादृतुमतीं स्त्रियम् ॥
		(अ.सं.शा. 1/41, अ.द्व.शा. 1/20-21)

- स्त्री का मुख स्वस्थ (वाग्भट-कृश) तथा प्रसन्न हो।
- आत्मा (शरीर), मुख एवं दन्त क्लेदयुक्त हों।
- पुरुष तथा प्रियकथाओं की अभिलाषा करने वाली हो।
- कुक्षि, आँख एवं मूर्ध में शिथिलता हो।
- भुजा, कुच (स्तन), श्रोणि, नाभि, जंघा एवं स्फिक् (नितम्ब) में स्फुरण हो।
- मैथुन कार्य में हर्ष एवं उत्सुकता हो उस स्त्री को ऋतुमती जानना चाहिए।

ऋतुमती हेतु वर्ज्य कर्म

- सभी आचार्यों ने ऋतुमती को क्षार के प्रयोग का निषेध किया है।
- महर्षि काश्यप ने ऋतुमती को वमनकर्म निषिद्ध किया है। साथ ही शुद्ध-स्नाता को नस्य देने से योनिशोष बताया है एवं इसके चिकित्सा हेतु पुष्पाध्याय एवं यूषाध्याय में वर्णित औषधियों और दूध से लिप्त जीवनीयगण की औषधियों का प्रयोग बताया है।

महत्त्वपूर्ण— काश्यप → रजःस्वला को नस्य देने से ऋतुसम्बन्धी व्याधियाँ
ऋतुमती को नस्य देने से योनिशोष (योनिरुपशुष्यति) होता है।

Physiology of female reproductive system

Menarche

Menarche is beginning of the first menstrual cycle, or first menstrual bleeding. From both social and medical perspectives, it is often considered the central event of female puberty, as it signals the possibility of fertility. Girls experience menarche at different ages. The timing of menarche is influenced by female biology, as well as genetic and environmental factors, especially nutritional factors.

Puberty

Definition

Puberty is the stage of physical maturation in which an individual becomes physiologically capable of sexual reproduction. The biological changes that occur during

puberty include several neurosecretory factors and/or hormones, all of which modulate somatic growth, the development of the sex glands, and their endocrine as well as exocrine secretions.

The resultant increase in sex steroid production will ensure the appearance and maintenance of sexual characteristics and the capacity for reproduction. The entire endocrine system is altered during adolescence. However, it is essentially the activation of the hypothalamic-pituitary-gonadal axis that induces and enhances the progressive ovarian sex hormone secretion that are responsible for the profound biological, morphological, and psychological changes to which the adolescent is subjected.

Physical Changes of Puberty

These stages reflect the progressive modifications of the external genitalia and sexual hair. Secondary sex characteristics appear at a mean age of 10.5 years in girls.

Puberty is considered precocious if these changes are noted prior to 8 years of age in and is considered delayed when such changes do not occur prior to 13 years of age in girls.

Female Secondary Sex Characteristics

Secondary sexual development in girls involves the enlargement of the labia, breast budding (thelarche), and growth of pubic and axillary hairs (pubarche and adrenarche). A discrete budding of the breast appears at first and usually follows a short-lived prepubertal slowing in growth kinetics. Between 11 and 14.5 years of age, the typical adolescent growth spurt takes place, and acne is frequent.

Initially, a small breast subareolar nodule is observed, followed within approximately 6 months by the appearance of pubic hair and, shortly thereafter, axillary hair. A progressive increase in breast size, sexual hair, and genital development with the vaginal mucosa becoming more humid, of a darker pink colour, and taking on a secretory appearance will follow. The uterus increases in size when the first menstruation occurs, and the maximal growth rate is reached.

Most girls reach menarche around 12.5 to 13 years of age; however, its occurrence may be as early as 10 or as late as 15 years of age in otherwise-normal girls.

First ovulatory cycles usually occur at a median age of 9 to 10 months after menarche. However, the time sequence in the appearance of sex characteristics may vary. If breast development, pubic and/or axillary hair, and menses occur earlier than normal variations from the mean, the terms premature thelarche, pubarche and/or adrenarche, and menarche are respectively used. Puberty is completed usually within 3 to 4 years of its onset, and the final height resulting from complete fusion of the epiphyses occurs within approximately 2 years after menarche.

Ovarian and Uterine Development

The rising levels of plasma gonadotropins stimulate the ovary to produce increasing amounts of estradiol. Estradiol is responsible for the development of secondary sexual characteristics, fat redistribution (hips, breasts), and bone maturation. The maturation of the ovary at adolescence correlates well with estradiol secretion and the stages of puberty.

In prepuberty, the ovarian size volume extends from 0.5 cm^3 to 1.0 cm^3 or more, indicating that puberty has begun. During puberty, the ovarian size increases rapidly to a mean postpubertal volume of 4.0 cm^3 .

The prepubertal uterus is tear-drop shaped, with the neck and isthmus accounting for up to two-thirds of the uterine volume; then, with the production of oestrogens, it becomes pear shaped, with the uterine body increasing in length and thickness proportionately more than the cervix.

Hormonal Changes of Puberty

Gonadotrophin-Releasing Hormone

In prepubertal girls, no significant luteinizing hormone (LH) or follicle-stimulating hormone (FSH) response to intravenous or subcutaneous administration of GnRH is observed. During adolescence, the LH response to GnRH increases progressively in both sexes. The increase of FSH is much less marked than that of LH. The primary triggering mechanism that initiates the activation of the hypothalamic-pituitary-gonadal axis at puberty is still hypothetical. One of the important neuroendocrine mechanisms that control the onset of puberty is probably an increase in the frequency of GnRH pulse stimulation of the pituitary.

Gonadotropins

The first demonstrable biological change of puberty is the appearance of pulsatile LH release during sleep. As puberty progresses, the frequency and amplitude of LH secretory peaks increase, although peaks are also found during the wake period. At the end of puberty, the difference between sleep and wake LH secretory patterns disappears. In girls, circulating FSH levels increase progressively from 10 to 11 years of age, approximately 1 year prior to LH. Thereafter, gonadotropins continue to increase throughout puberty, but important fluctuations are observed in relation to the menstrual cycle.

Prolactin

Serum prolactin concentration increase modestly.

Adrenal Steroids

Adrenal androgens vary from infancy through adolescence. When adrenal glands increase production of dehydroepiandrosterone (DHEA) there is appearance of pubic and axillary hairs. In girls, dehydroepiandrosterone and dehydroepian-drosterone sulfate (DHEAS) increase as early as 6 to 7 years of age, followed within 1 to 2 years by a concomitant increase in androstenedione.

Ovarian Hormones

During puberty, plasma estradiol levels fluctuate widely, probably reflecting successive waves of follicular development that fail to reach the ovulatory stage. The uterine endometrium is affected by these changes and undergoes cycles of proliferation and regression, until a point is reached when substantial growth occurs so that withdrawal of oestrogen results in the first menstruation. Plasma testosterone levels also increase at puberty although not as markedly as in males. Plasma progesterone remains at low levels even if secondary sexual characteristics have appeared. A rise in progesterone after menarche is an indicative that ovulation has occurred. The first ovulation does not take place until 6-9 months after menarche because the positive feedback mechanism of oestrogen is not developed.

GH, IGF-I and Insulin

There is accumulating evidence that growth hormone (GH) plays a role in pubertal development. Insulin is also important for normal growth. Plasma insulin levels increase throughout childhood, but the rise is particularly pronounced during puberty with a strong positive correlation with insulin-like growth factor-I (IGF-I).

Menstrual Cycle

Definition

Menstruation is monthly uterine bleeding for 4-5 days in 28 days cycle during reproductive life of a woman from menarche to menopause. Menstrual cycle is normal uterine function whereby endometrium prepares itself to receive the fertilized ovum. In the event of fertilization of the ovum on meeting a sperm, conception takes place and there is no monthly bleeding.

Bleeding comes from Oestrogen-progesterone primed endometrium. Woman gets 13 menses in a year and around 400 menses in her reproductive life. The menstrual cycle of 28 days starts on day of onset of menstruation and ends at day 28 on start of next menstruation.

Ovarian Cycle

Ovarian follicles (20 in number) are grown in a menstrual cycle in three steps.

- a) **Ovarian Follicles** are grown from primordial follicles. A single graafian follicle matures and becomes dominant by the effect of FSH while other follicles regress.
- b) **Oestradiol** is secreted by maturing ovarian follicle in the circulation – stimulates hypothalamus and anterior pituitary to cause surge of LH and FSH hormones in blood on 12th day of menstrual cycle.
- c) **Ovulation** occurs on 14th day of menstrual cycle. Corpus luteum is formed from the mature graafian follicle following ovulation due to LH effect.

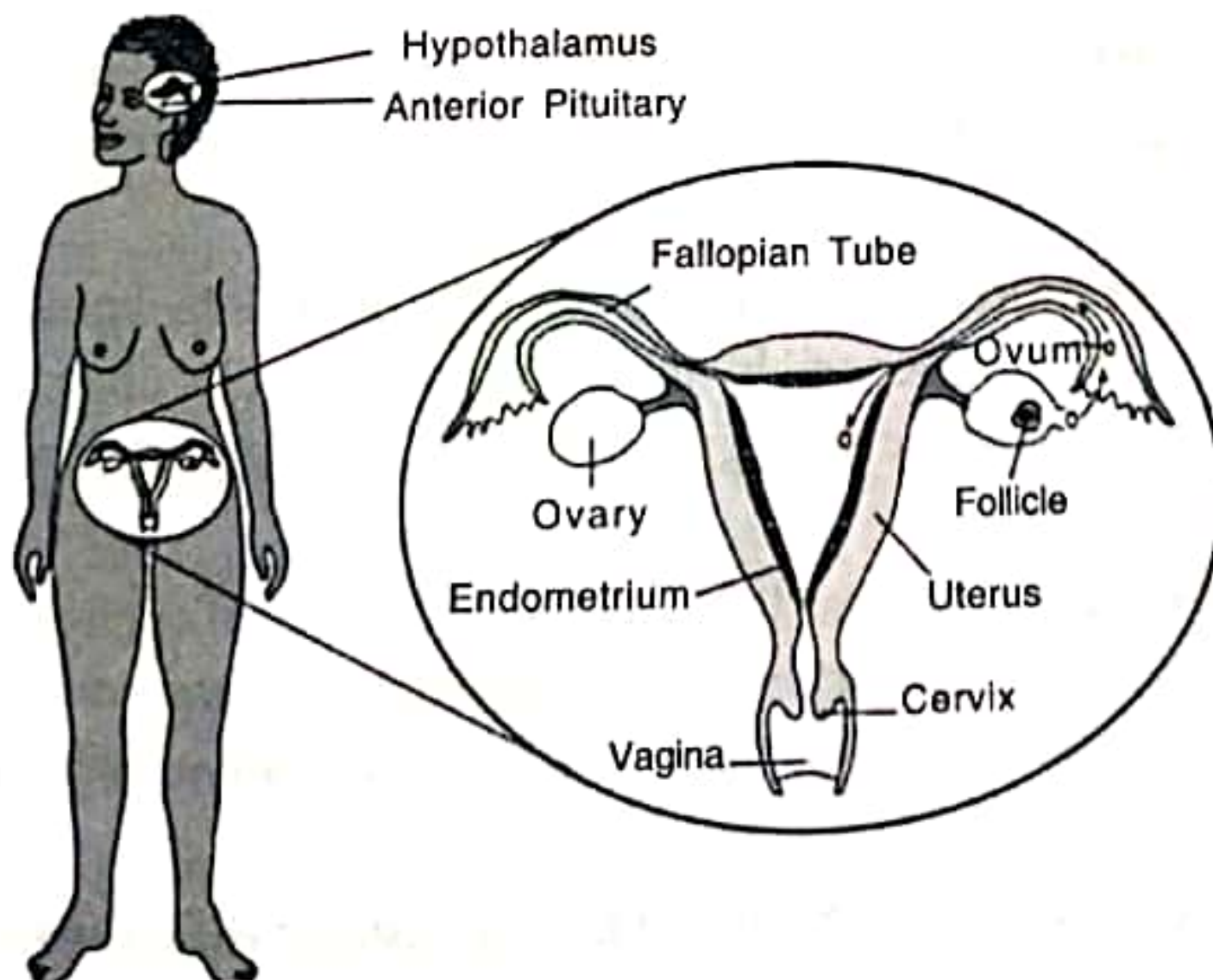
Corpus luteum remains mature from 19th to 26th day, then it degenerates on 27th or 28th day if no pregnancy occurs in menstrual cycle.

Uterine Cycle

- a) **Proliferative phase** : Oestradiol from ovarian follicles causes proliferative changes in endometrium (7-10 day)
- b) **Secretory phase** : Progesterone from corpus luteum causes secretory changes in endometrium to receive fertilized ovum for embedding.
- c) **Menstrual bleeding** : Occurs for 4-5 days due to shedding away of endometrial bits and bleeding from endometrial bed. Menstrual phase is caused by withdrawal of oestradiol and progesterone support to endometrium.

Organs involved in Menstrual cycle

The menstrual cycle includes the activities of the hormones of the hypothalamus, the anterior pituitary gland and the ovaries, and the resulting changes in the ovaries, uterus, cervix, and basal body temperature (BBT).



Hypothalamus : It releases gonadotropin releasing factor (GnRF) which regulates the release of luteinizing hormone (LH) and follicle stimulating hormone (FSH) from the anterior pituitary gland.

Anterior pituitary gland : A pea-sized gland located at the base of the brain and connected to the hypothalamus. Among many other functions, it produces, stores, and releases FSH and LH.

Ovaries: The pair of glands in the female which produce ova (eggs) and the female sex hormones, Oestrogen and progesterone.

Ovum (Plural = ova) : The female reproductive germ cell that, when fertilized by a sperm, can develop into a new individual of the same species.

Ovarian follicle: Small sac in the ovary that encloses an ovum. At the beginning of each menstrual cycle, several ova begin to mature. One ovum fully matures and is then released by the dominant ovarian follicle. At birth, each woman has about 600,000 ovarian follicles in each ovary. During a woman's lifetime, only about 400 ova fully mature. The remainder dissolve and are reabsorbed by each ovary.

Corpus luteum : After ovulation, the dominant ovarian follicle becomes the corpus luteum which produces small amount of oestrogen and large amount of progesterone.

Fallopian tubes : It is the place where the sperm meets the ovum and fertilization takes place.

Uterus : The fertilized ovum grows and develops during pregnancy in uterus. In the absence of fertilization of the ovum, it sheds its lining (endometrium) during menstruation.

Endometrium : It is the lining epithelium of the uterine cavity above the internal os. It is consisted by surface epithelium, glands, stroma and blood vessels. It has two distinct zone :

(a) **Basal zone (Stratum basalis)** : It is about $1/3^{\text{rd}}$ of total thickness of endometrium: i.e. 1 mm. This zone is uninfluenced by hormones so no cyclic changes are observed. After shedding of functional zone during menstruation, the regeneration of all the components occurs from basal zone.

(b) **Superficial functional zone** : It is under the influence of cyclic ovarian hormones fluctuation. The changes occurs according to the change in hormone concentration in different phases of menstrual cycle that is menstrual, proliferative and secretory phase and the thickness also varies.

Vagina : It is the passageway through which menstrual fluid flows.

Hormonal effect on Menstruation

1. A Releasing Factor of the Hypothalamus

GnRF (Gonadotropin releasing factor) : GnRF is a special kind of hormone called a releasing factor formed in the hypothalamus. A releasing factor causes another gland or organ to release a different hormones into the blood stream. Here GnRF causes the anterior pituitary gland to produce, store and release FSH and LH.

2. Hormones of the Anterior Pituitary Gland

FSH (follicle stimulating hormone) : FSH stimulates the growth of the ovarian follicles. As the ovarian follicles develop, FSH also stimulates the follicle cells to secrete large amount of Oestrogen.

LH (luteinizing hormone) : A surge, or sudden release, of LH causes ovulation, the release of a mature ovum from the dominant ovarian follicle. After ovulation, LH stimulates the empty follicle to develop into the corpus luteum. LH then causes the corpus luteum to secrete increased amount of progesterone and small amount of Oestrogen.

3. Hormones of the Ovaries

The ovaries contain the ovarian follicles which produce oestrogen while maturing. After ovulation, the dominant ovarian follicle becomes the corpus luteum which produces progesterone and small amount of oestrogen.

Oestrogen

Every month, the endometrium is built up under the influence of Oestrogen produced by the ovarian follicles. Oestrogen stimulates glands in both the endometrium and the cervical canal. Changes in the cervical glands cause changes in the cervical mucus, making it clear, stretchy and slippery so that sperm can pass easily. The endometrial blood supply is increased in preparation for a possible fertilized ovum, and a thickened layer of endometrial tissue develops. An Oestrogen, along with FSH, also promotes the growth of the ovum in the ovarian follicle.

Oestrogen causes "feedback" to the anterior pituitary gland for the regulation of FSH and LH. When the Oestrogen level increases to a certain level, it gives feedback to the anterior pituitary gland, causing a surge of stored LH that triggers ovulation. When the amount of Oestrogen in the blood becomes low, it causes feedback to the anterior pituitary gland to produce more FSH and LH in order to start a new menstrual cycle.

Oestrogen also has other important functions in the body, such as:

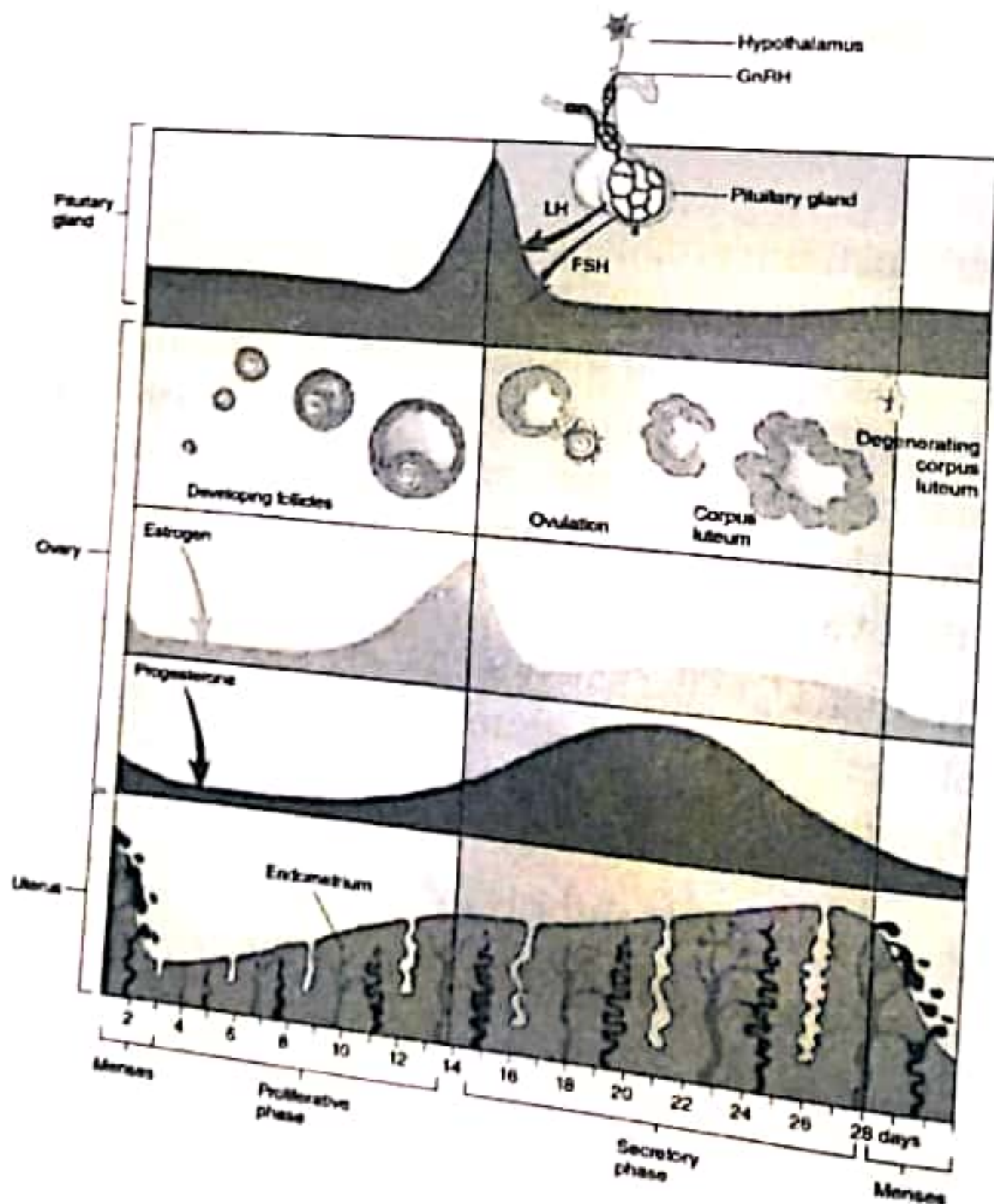
- It initiates the growth and development of the uterus and other reproductive organs during puberty and pregnancy.
- Oestrogen promotes the growth of mammary ducts and fat deposit in the breasts

- during puberty and pregnancy.
- It promotes bone growth and helps to retain calcium in the bones throughout a woman's life.
- It gives protection from atherosclerosis and cardiovascular disease by causing blood vessels to dilate and by limiting the formation of atherosclerotic plaques from lipids.

Progesterone

After the dominant ovarian follicle releases a mature ovum, it changes into a corpus luteum and begins to secrete progesterone. Progesterone and oestrogen further develop the endometrium by increasing the maturation of blood vessels in the endometrium. They cause the endometrial glands to enlarge and to begin secreting nutrients into the uterine cavity (in case the ovum is fertilized). Progesterone, however, also limits the volume of the endometrium; without progesterone, Oestrogen stimulation of the endometrium would be too great.

Progesterone affects hormone release from the hypothalamus and anterior pituitary gland. Through this "feedback" system, high levels of progesterone inhibit GnRH secretion and decrease FSH and LH secretions.



Progesterone also has other important functions in the body, such as:

- It sustains early pregnancy until the placenta develops (in approximately 10 weeks).
- The decline of progesterone helps to initiate uterine contractions in labour.
- It provides a protective effect from breast cancer and endometrial cancer.

Overview of Hormones Involved in the Menstrual Cycle

Hormone	Secreted By	Chief Functions
GnRF (gonadotropin releasing factor)	Hypothalamus	Regulates the secretion of FSH and LH.
FSH (follicle stimulating hormone)	Anterior pituitary	Stimulates the growth of ovarian follicles. Stimulates the ovarian follicle cells to secrete oestrogen.
LH (luteinizing hormone)	Anterior pituitary	Causes ovulation. Converts ruptured dominant ovarian follicle into the corpus luteum. Stimulates the corpus luteum to secrete progesterone.
Oestrogen	Ovary (Ovarian follicle)	Promotes growth of blood vessels in the endometrium and increases the amount of endometrium to be shed. Promotes maturation of ovarian follicle. Promotes an increase in the amount of clear, stretchy and slippery "fertile" cervical mucus production, to aid sperm. High levels cause a surge in LH, triggering ovulation. Very low levels cause the anterior pituitary gland to produce more FSH and LH.
Progesterone	Ovary (Corpus luteum)	Promotes further development of blood vessels and glands in the endometrium. Limits the amount of volume of endometrium. Decreases the quantity of cervical

		<p>mucus produced and causes the mucus to become so thick that sperm cannot travel through it.</p> <p>High levels inhibit secretion of GnRF and, therefore, FSH and LH.</p>
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The Process of Feedback in the Menstrual Cycle

In the menstrual cycle, "feedback" is the regulation of the output of one hormone according to the amount or effects of other circulating hormones.

Negative feedback occurs when the output of one hormone is **decreased** because of the amount of other hormones circulating in the blood. For example,

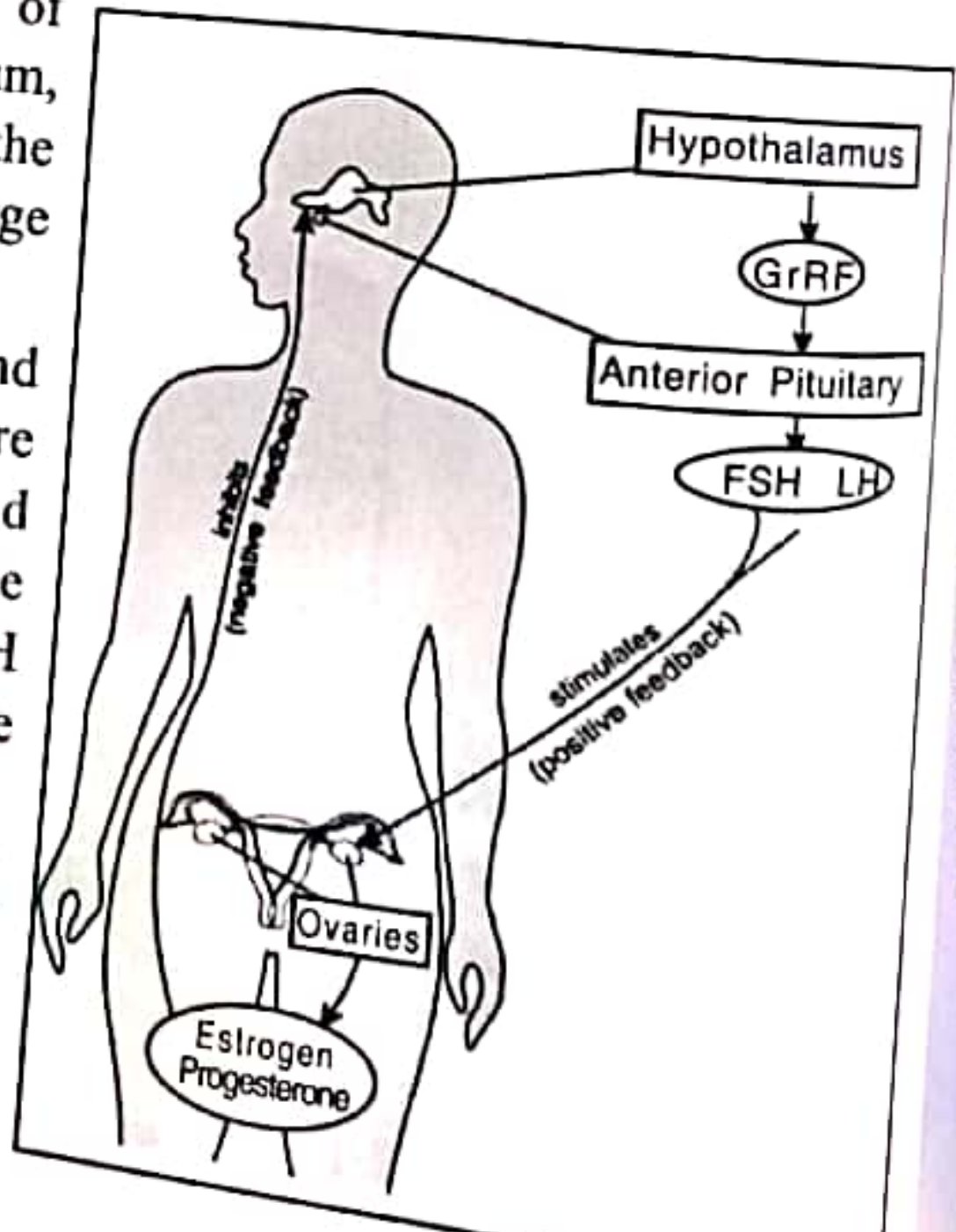
- High blood levels of progesterone (and moderately high levels of oestrogen) decrease the amount of GnRF secreted by the hypothalamus.
- When less GnRF is secreted, secretions of FSH and LH from the anterior pituitary gland are also decreased.

Positive feedback occurs when the output of a hormone is **increased** because of circulating hormone levels. For example :

- The anterior pituitary gland responds to low blood levels of oestrogen by producing and storing more FSH and LH.
- The midcycle rise in blood levels of Oestrogen, signaling a mature ovum, causes the release of stored LH from the anterior pituitary gland. This LH surge results in ovulation.

The relationships of the hormones and organs involved in the menstrual cycle are complex. The production of Oestrogen and progesterone by the ovaries is regulated by the hormones of the anterior pituitary gland, FSH and LH, which are regulated by the hypothalamus.

During the menstrual cycle, the normal level for each hormone continuously changes. These hormone levels influence one another. The given diagram demonstrates an example of feedback.



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Three Phases of the Menstrual Cycle

The phases of the menstrual cycle are usually described by the changes that occur in the ovary (the ovarian cycle) and/or by the changes that occur in the uterus (the endometrial cycle). According to the changes in hormone levels there is consequent changes in the reproductive organs are observed in the menstrual cycle.

The phases will be referred to as the:

1. Menstrual Bleeding Phase
2. Oestrogen Phase
3. Progesterone Phase.

The following chart shows relation between three phases, ovarian and endometrial cycle :

Three Phases	Ovarian cycle	Endometrial cycle
Menstrual Bleeding Phase	Follicular Phase	Menstrual Phase
Oestrogen Phase	Follicular Phase	Proliferative Phase
Progesterone Phase	Luteal Phase	Secretory Phase

The changes that occur during each phase in the anterior pituitary gland, ovaries, endometrium, cervix, and the resulting influence on the BBT is now described.

1. Menstrual Bleeding Phase (Day 1st to 5th)

Menstrual bleeding phase is also known as menstruation, menses or period. Hormone levels are at their lowest point during this phase. The following changes occur during the menstrual bleeding phase :

Hypothalamus and Anterior Pituitary Gland

The hypothalamus begins to produce GnRF because of the low levels of oestrogen and progesterone in the blood. GnRF stimulates the anterior pituitary gland to begin producing, storing and releasing FSH and LH.

Ovaries

Approximately 20 ovarian follicles enlarge during the first week of each menstrual cycle. They produce oestrogen and begin to ripen an ovum in response to FSH from the anterior pituitary gland.

Endometrium

During the menstrual bleeding phase, the superficial layer of the thick endometrial

lining is detached from the uterine wall, resulting in discharge of endometrial tissue, fluid and blood. Menstrual bleeding occurs due to damage of arteriolar wall by spasm of the arterioles and by local tissue destruction after release of proteolytic enzymes from the breakdown of lysosomes. The bleeding occurs from broken arteries, veins and capillaries. The bleeding lasts for 3 to 5 days. The average blood loss is about 50 milliliter. The bleeding stops as a result of combined effect of prolonged vasoconstriction, myometrial contraction and local aggregation of platelets with deposition of fibrin around them.

Cervix

The cervical canal is open slightly to permit menstrual flow to escape. The cervical glands produce very little amount of mucus during these low-oestrogen days of the cycle.

Basal Body Temperature (BBT)

The BBT is the temperature of the body at rest. During the menstrual cycle, the BBT rises from a lower level to a higher level. During the menstrual bleeding phase, the BBT is at its lower level due to the decrease in the production of progesterone in the body.

2. Oestrogen Phase (Day 6th to 14th)

The oestrogen phase begins about day 6 and lasts until about day 13 to 14 when ovulation occurs. It is more variable in length than the other phases. The following changes occur during the oestrogen phase:

Anterior Pituitary Gland

The anterior pituitary gland continues to increase its production and storage of LH and FSH. Small amount of LH and FSH are released into the bloodstream.

Around day 13 (just prior to ovulation), the high level of oestrogen in the blood produced by the dominant ovarian follicle triggers a surge of stored LH from the anterior pituitary gland into the bloodstream.

Ovaries

By the day 5 to 7, one ovarian follicle is developing more rapidly than the others. This is the dominant follicle which will go on to ovulation. The other follicles stop growing; most will shrink and disappear into the ovarian tissue.

As the dominant follicle cell develops, it releases an increased amount of Oestrogen into the bloodstream. This process is called ovulation. Ovulation occurs about 12 to 16 days before the beginning of the next menses. Even in shorter menstrual cycles, ovulation occurs before day 10 of the cycle; ovulation, which may result in pregnancy ("fertile ovulation"), rarely occurs before day 12.

Endometrium

The endometrium is built up under the influence of Oestrogen produced by the growing ovarian follicles. The endometrium develops glands, capillaries and general tissue swelling. The glands become tubular and lie perpendicular to the surface. The epithelium becomes columnar with the nuclei placed at the base. The process of mitosis starts in epithelial cells. The stromal cells become spindle-shaped. The spiral vessels form loose capillary network. The thickness of endometrium measures about 3-4 mm. With increased blood supply, the endometrium is prepared for a possible implantation of a fertilized ovum.

Cervix

The cervical canal is closed, except during the time of ovulation. It is then open to permit the entrance of sperm.

Initially in the oestrogen phase, no mucus loss from the cervix is apparent. A sensation of dryness exists (although the interior of the vagina is always moist). As the blood levels of oestrogen increase, the quantity of cervical mucus also steadily increases because glands in the cervical canal are stimulated by the oestrogen. The maximum amount of mucus is produced about at the time of ovulation. The mucus becomes clear, slippery and stretchy (like uncooked egg white) and can flow out of the vagina. This type of mucus nourishes the sperm and helps it to travel into the uterus.

Basal Body Temperature (BBT)

The BBT remains at its lower level under the influence of Oestrogen. Just before ovulation, at the start of the LH surge, the BBT may fall a bit more.

3. Progesterone Phase (Day 15th to 28th)

The progesterone phase begins at approximately day 15 and ends at about day 28. The length of this phase is 2 weeks long. It does not vary much from month to month or from woman to woman. The following changes occur during the progesterone phase:

Anterior Pituitary Gland

The empty dominant follicle in the ovary changes into a corpus luteum (which produces progesterone and some oestrogen) because of stimulation resulting from the high level of LH released by the anterior pituitary gland.

If the ovum is not fertilized, the activity of the pituitary is inhibited because of the high level of progesterone in the blood produced by the corpus luteum. The pituitary production of LH is then reduced by the negative feedback action.

Ovaries

The corpus luteum is a reorganization of the cells from the ruptured egg follicle. The corpus luteum steadily produces progesterone. The progesterone reaches a maximum amount about 8 days after ovulation. The corpus luteum also produces small amount of oestrogen during this phase.

As progesterone secretion increases, LH secretion decreases (negative feedback). The corpus luteum begins to degenerate by day 23 to 24 because of low level of LH. Thus, the production of oestrogen and progesterone also declines.

Endometrium

The progesterone can only act on the endometrium previously primed by Oestrogen. The surface epithelium becomes more columnar and ciliated. The endometrial glands increase in size & there is appearance of subnuclear vacuoles due to secretion of glycogen between the nuclei and the basement membrane. The glands are filled with nutritive fluid & become corkscrew shaped. The endometrial glands secrete nutrients into the uterine cavity. These nutrients can nourish a fertilized ovum until it is implanted.

The stromal cells become swollen, large and polyhedral. From day 15 to 22, the blood supply to the endometrium continues to increase due to the rising levels of progesterone produced by the corpus luteum of the ovary. The blood vessels undergo marked spiraling. The thickness of the endometrium reaches upto 6-8 mm.

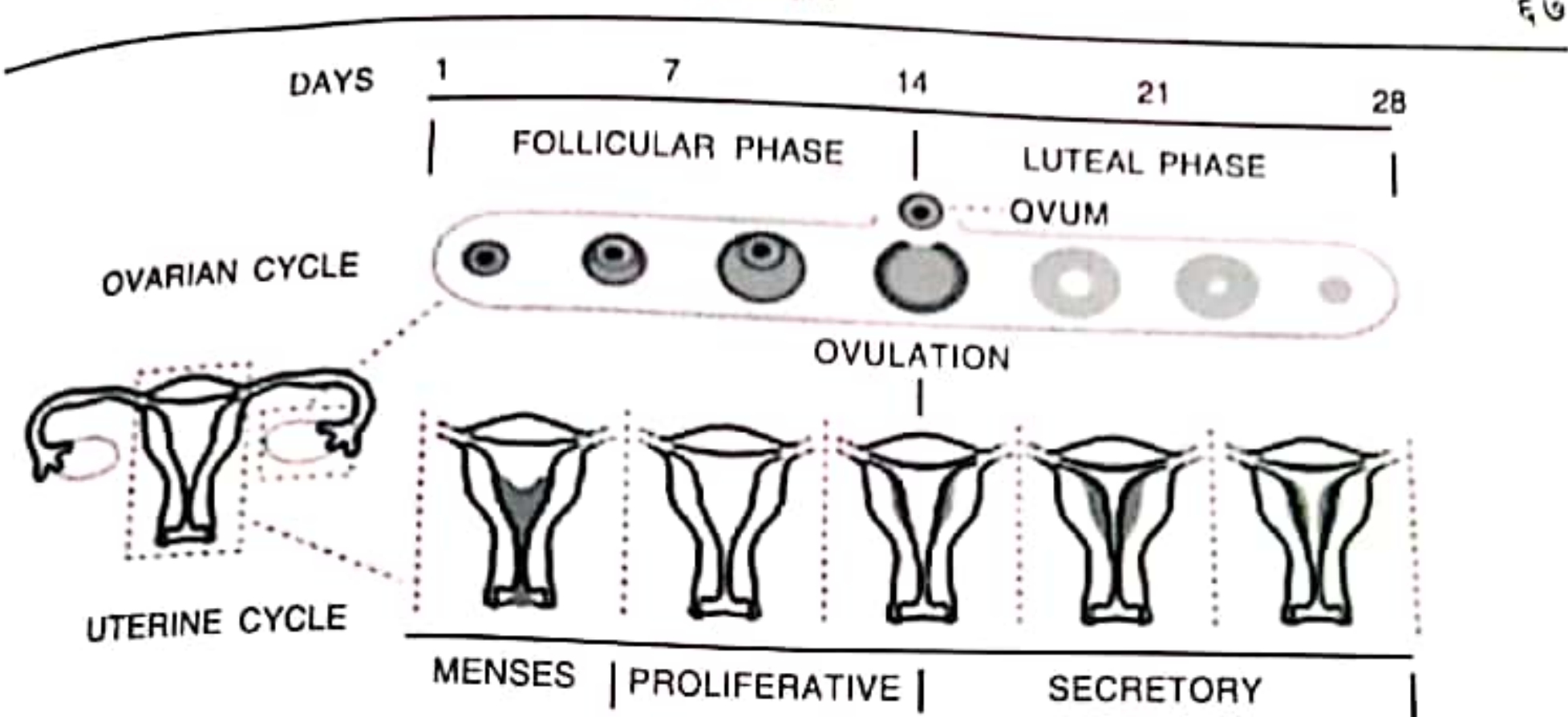
Progesterone and oestrogen in the blood decrease toward the end of this phase because of the degenerating corpus luteum (days 23 to 28). The blood vessels supplying the endometrium constrict as a result of this lack of stimulation from the ovarian hormones. The endometrial cells cannot receive the oxygen and nutrients that the blood vessels carried, and they begin to die. The menstrual phase begins, and menstrual bleeding occurs.

Cervix

During the progesterone phase, the cervical canal remains closed. The quantity of cervical mucus decreases and become sticky, thick and cloudy. This mucus makes difficult for sperm to penetrate and travel into the uterus.

Basal Body Temperature (BBT)

Shortly before, during or after ovulation, the BBT rises 0.2 to 0.5°C, due to the increase in progesterone production. The BBT remains elevated until progesterone levels drop and the menstrual phase begins.



Menstrual cycle

Oogenesis

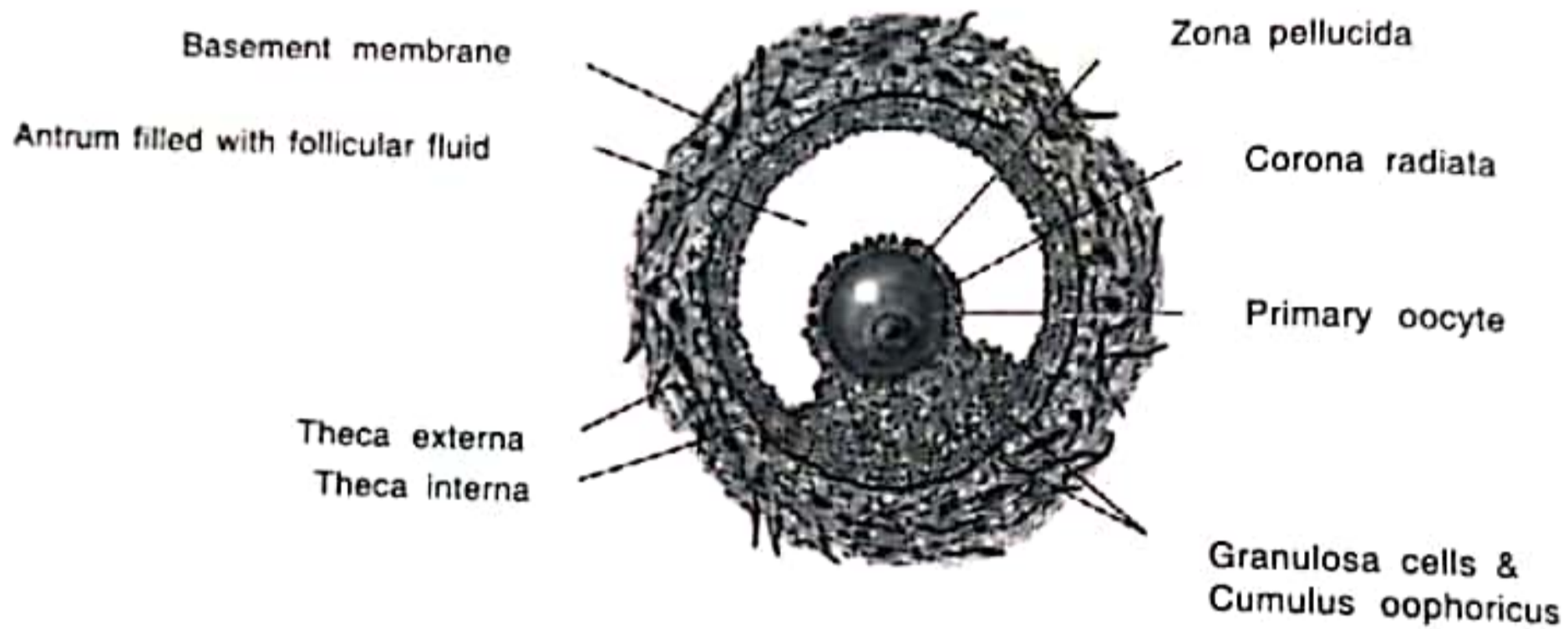
The process involved in the development of a mature ovum is called oogenesis. The cortex contains all the oogonia to be used throughout the fertile life of a woman and they do not multiply thereafter.

Oogenesis is divided into three phases :

1. **Multiplication phase** : This phase starts during embryonic development. Germinal epithelial cells of the ovaries undergo mitotic division to produce millions of oogonia. The oogonia multiply by mitotic divisions and form the primary oocytes. Some of the stromal cells become flattened and surround the primary oocyte are called primordial follicles.
At birth all oogonia are replaced by primary oocytes which have finished the prophase of the I meiotic division and remain in resting phase (diplotene stage) between prophase and metaphase.
2. **Growth phase** : In this phase the size of primary oocytes increases enormously. Large amount of fats and proteins becomes accumulated in primary oocyte. The cytoplasm of oocyte becomes rich in RNA, DNA, ATP & enzymes. The nucleus becomes large due to increased amount of nucleoplasm.
3. **Maturation phase** : This phase starts after puberty. The essence of maturation is reduction of number of chromosomes to half. The primary oocyte restarts its meiosis I and completes to produce secondary oocyte and 1st polar body. The secondary oocytes undergo meiosis II but stops at metaphase II under the influence of metaphase

promoting factor (MPF). Meiosis II is completed after sperm entry which deactivates MPF and activates anaphase promoting complex (APC).

Under the influence of APC, the secondary oocytes completes meiosis II to produce ovum and 2nd polar body. The nucleus of the ovum becomes female pronucleus having 23 chromosomes (23, X). The ovum is surrounded by a cell membrane called vitelline membrane.

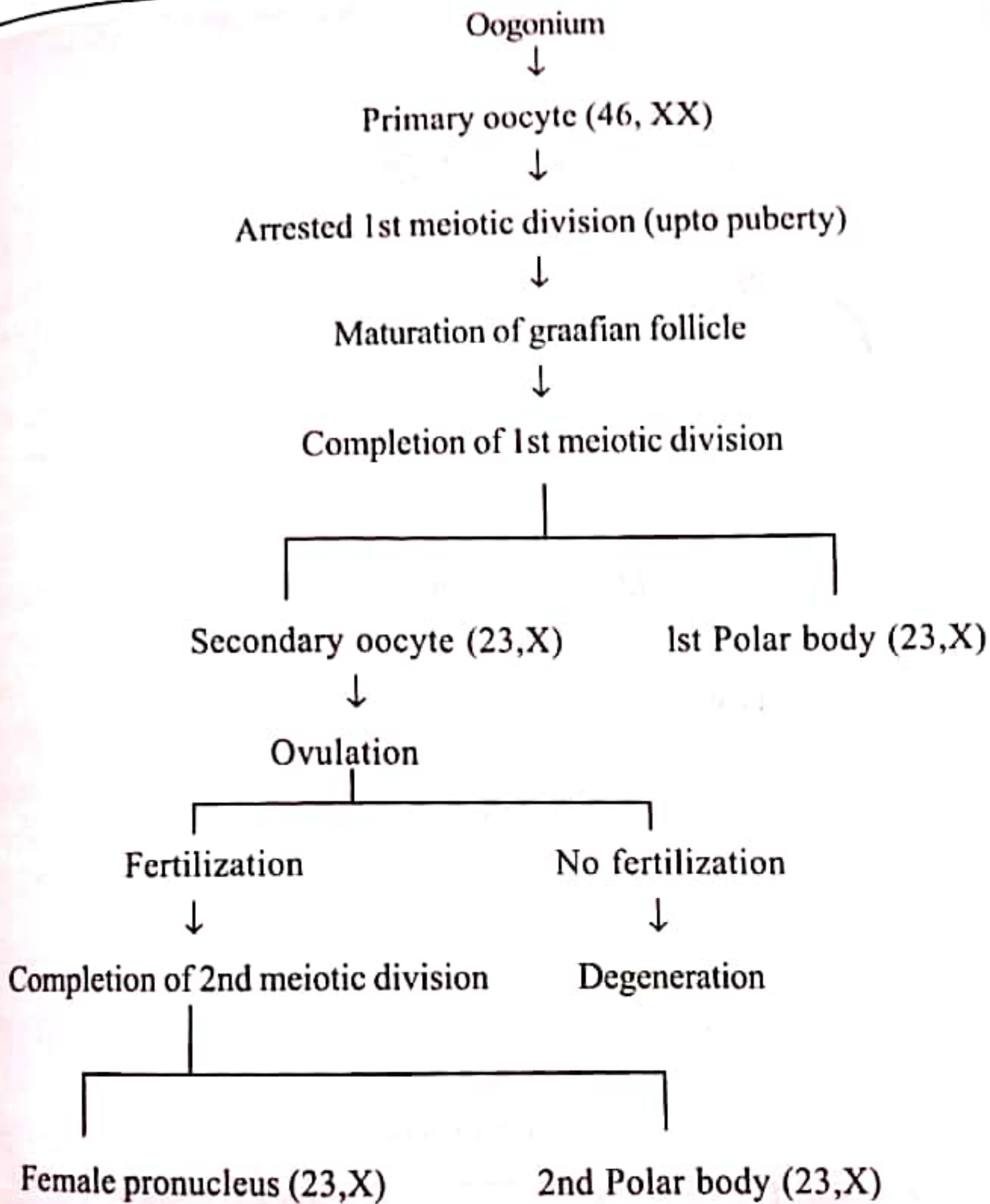


Graafian follicle

- A homogenous membrane surrounds the oocyte forming zona pellucida.
- The follicular cells proliferate to form several layers of cells called granulosa cells. A cavity appears within the granulosa cells and with its appearance a follicle is formed.
- The cavity increases in size and wall of the follicle spreads and becomes thin and oocyte lies eccentrically within the follicle surrounded by granulosa cells called as cumulus oophorus and cells that attach it to the follicular wall are called discus proligerus.
- As the follicle expands, stromal cells surrounding the membranous granulosa condense to form theca interna which secretes Oestrogen and are called theca gland.
- Fibrous tissue surrounding theca interna condense to form another covering called theca externa.

Viability of ovum

An ovum usually degenerates 24 hours after ovulation and at most may survive for 2 days.

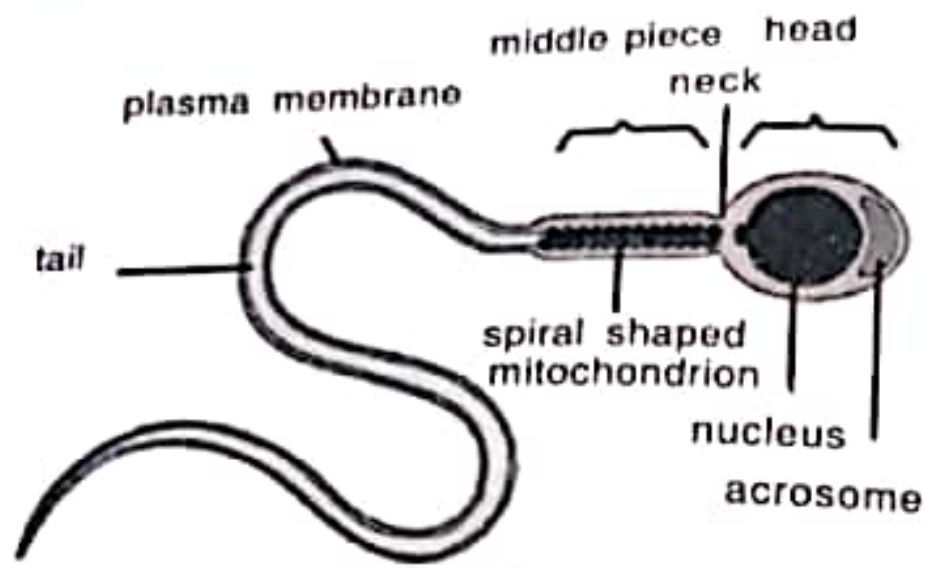


Spermatogenesis

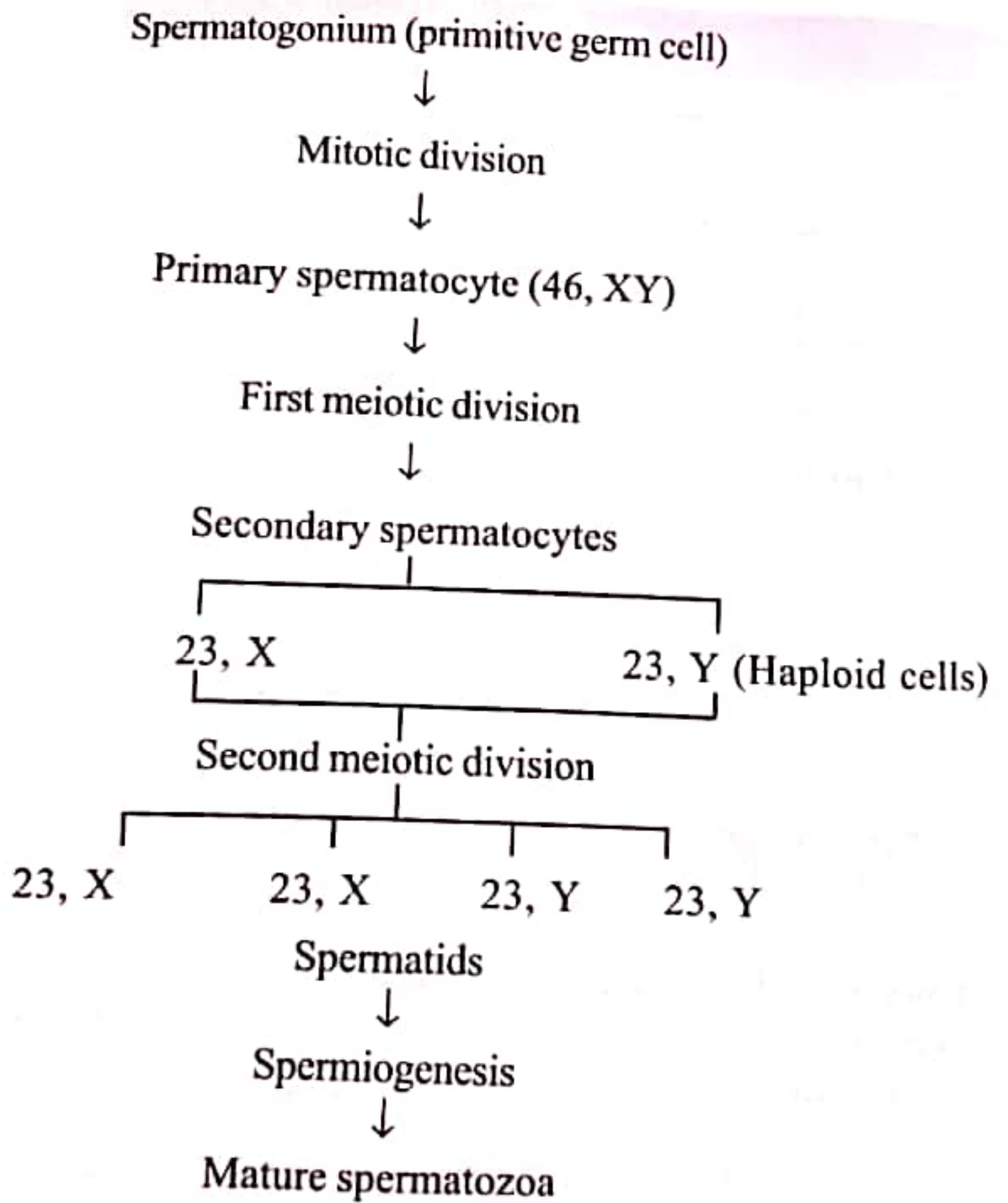
The process involved in the development of the spermatids from the primordial male germ cells and their differentiation into spermatozoa is called spermatogenesis. The time period required for a spermatogonium to develop into a mature spermatozoon is about 61 days.

Vaibility of sperm

Sperms usually degenerate 48 hours after ejaculation but may survive for 4 days in female genital tract.



Sperm



Spermiogenesis is where cell modelling takes place i.e. formation of acrosome cap, development of tail and nuclear condensation. There is no cell division in spermiogenesis.

Ovulation

Ovulation is the release of eggs from the ovaries. This event occurs when the ovarian follicles rupture and release the secondary oocyte ovarian cell.

Ovulation occurs about midway through the menstrual cycle, after the follicular phase. The few days surrounding ovulation (from approximately days 10 to 18 of a 28-day cycle), constitute the most fertile phase. The time from the beginning of the last menstrual period (LMP) until ovulation is, on average, 14.6 days, but with substantial variation between females and between cycles in any single female, with an overall 95% prediction interval of 8.2 to 20.5 days.

Oestrogen levels peak towards the end of the follicular phase. The process of ovulation is controlled by the hypothalamus and through the release of hormones secreted in the anterior lobe of the pituitary gland, luteinizing hormone (LH) and follicle-stimulating hormone (FSH). A surge in levels of luteinizing hormone and follicle-stimulating hormone lasts from 24 to 36 hours, and results in the rupture of the ovarian follicles, causing the oocyte to be released from the ovary.

In the preovulatory phase of the menstrual cycle, the ovarian follicle will undergo a series of transformations called cumulus expansion, which is stimulated by FSH. Through a signal transduction cascade initiated by LH, proteolytic enzymes are secreted by the follicles that degrade the follicular tissue at the site of the blister, forming a hole called the stigma. The secondary oocyte leaves the ruptured follicle and moves out into the peritoneal cavity through the stigma, where it is caught by the fimbriae at the end of the fallopian tube. After entering the fallopian tube, the oocyte is pushed along by cilia, beginning its journey toward the uterus.

Effects of Pregnancy on The Menstrual Cycle

If fertilization of the ovum occurs, the hormone patterns of the last half of the menstrual cycle change. Another hormone, human chorionic gonadotropin (hCG), will be produced by the developing placenta. hCG is the hormone detected by a pregnancy test. Its blood levels peak at 8 to 12 weeks after conception.

Anterior Pituitary Gland

The levels of FSH and LH fall greatly, because their production is suppressed through negative feedback by the high blood levels of oestrogen and progesterone.

Ovaries

In early pregnancy, hCG prevents the corpus luteum from degenerating, so it will continue to function and release progesterone and oestrogen to support the develop

embryo. By 7 to 10 weeks after conception, the placenta is able to provide the high levels of oestrogen and progesterone needed in pregnancy.

Endometrium

When the embryo implants, the continued secretion of progesterone causes the endometrial cells to swell even larger and store and provide more nutrients for the growth of the foetus.

Cervix

The external cervical canal enlarges slightly, bleeds more easily and becomes filled with a thick mucus "plug", which helps protect the amniotic sac from vaginal microbes.

Basal Body Temperature (BBT)

The BBT remains elevated, as in the progesterone phase of the menstrual cycle.

गर्भ विज्ञान

गर्भ की परिभाषा

शुक्रशोणितजीवसंयोगे तु खलु कुक्षिगते गर्भसंज्ञा भवति ॥ (च.सं.शा. 4/5)

कुक्षि (गर्भाशय) में शुक्र, शोणित एवं जीव के संयोग को गर्भ संज्ञा दिया गया है।

शुक्रशोणितं गर्भाशयस्थमात्मप्रकृति विकार समूर्च्छितं 'गर्भ' इत्युच्यते ।

(सु.सं.शा. 5/3)

गर्भाशय में स्थित शुक्र शोणित जब आत्मा (क्षेत्रज्ञ), प्रकृति (अष्ट प्रकृति) एवं विकार (पंचमहाभूत एवं एकादश इन्द्रियाँ) से समूर्च्छित (मिश्रिभूत) हो तो उसे गर्भ कहा जाता है। आचार्य भावमिश्र ने आचार्य सुश्रुत के सदृश ही वर्णन किया है।

कामान्मिथुनसंयोगे शुद्धशोणितशुक्रजः । गर्भः सञ्जायते नार्याः स जातो बाल उच्यते ॥

(शा.स.पूर्व.ख. 6/11)

काम के वशीभूत स्त्री-पुरुष के मैथुन करने पर शुद्ध शोणित एवं शुद्ध शुक्र के संयोग से स्त्री को गर्भ रहता है और वही गर्भ उत्पन्न हो जाने पर "बाल" कहा जाता है।

गर्भाधान विधि

विवाहयोग्य आयु

अथास्मै पञ्चविंशतिवर्षाय द्वादशवर्षा (षोडशवर्षा - डल्हण) पत्नीमा-वहेत्.....॥

(सु.सं.शा. 10/58)

अथ खलु पुमानेकविंशतिवर्षः कन्याम्.....द्वादशवर्ष.....विधिनोद्धहेत् ।

(अ.स.शा. 1/3)

आचार्य	पुरुष की आयु	स्त्री की आयु
आचार्य सुश्रुत	25 वर्ष	12 या 16 वर्ष
आचार्य वृद्धवाग्भट	21 वर्ष	12 वर्ष

विवाह योग्य कन्या के गुण

कन्यामतुल्यगोत्रां तुल्याभिजनामसञ्चारिरोगकुलप्रसूतां रूपशीललक्षणसम्पन्नामनूनामविनष्टदन्तैः कर्णनासानखकेशस्तनीं मृदुमरोगप्रकृतिमकपिलामपिङ्गलामहीनाधिकाङ्गीं द्वादशवर्षदेशीयाममरभुजगल्ल- रिदचलवृक्षपक्षिनक्षत्रान्त्यप्रेष्यभीषणकनामान्यनुद्वहन्तीमनघामनिन्ध्यामनिन्द्येन विधिनोद्धहेत् ॥

(अ.स.शा. 1/3)

आचार्य वृद्धवाग्भट ने विवाहयोग्य कन्या का वर्णन करते हुए कहा है कि वह कन्या—

- अतुल्यगोत्र और अभिजन कुल (धन और कुल में समान) में उत्पन्न हो।
- सञ्जारी रोग वाले कुल में न उत्पन्न हो।
- रूप-शील, शुभ लक्षण युक्त हो।
- दन्त, ओष्ठ, कान, नख, केश और स्तनों से पूर्ण हो।
- कोमलांगी, स्वस्थ प्रकृति वाली हो।
- कपिल, पिंगल, हीनांग, अधिकांगों वाली न हो।
- देवता, भुजंग, सरित, अचल (पर्वत), वृक्ष, पक्षि, नक्षत्र, अन्त्या (नीच जात), प्रेष्य (दासवाची), भीषण नर को न धारण करने वाली हो।
- पापरहित, अनिन्ध हो।

महर्षि भेल ने असमानगोत्र वाली ऋतुस्नाता स्त्री के सेवन से मेधावी एवं स्वस्थ पुत्र की उत्पत्ति बताई है।

सम्पूर्ण वीर्य एवं सन्तानोपत्ति हेतु आयु

पञ्चविंशे ततो वर्षेपुमान् नारी तु षोडशे ।
समत्वागतवीर्यौ तौ जानीयात् कुशलो भिषक् ॥

(सु.सं.सू. 35/13)

तस्यां षोडशवर्षायां पञ्चविंशति वर्षः पुरुषः पुत्रार्थं प्रयतेत ।
तदा हि तौ प्राप्तवीर्यौ वीर्यान्वितमपत्यं जनयतः ॥

(अं.स.शा. 1/4)

पूर्णषोडशवर्षा स्त्री पूर्णविंशेत सङ्गता ।
वीर्यवन्तं सुतं सूते.....॥

(अ.ह.शा. 1/8-9)

आचार्य	पुरुष की आयु	स्त्री की आयु
सुश्रुत	25 वर्ष	16 वर्ष
वृद्ध वाग्भट	25 वर्ष	16 वर्ष
वाग्भट	20 वर्ष	16 वर्ष

आचार्य चरक ने संभोग-क्षम आयु 16 से 70 वर्ष बताया है।

आचार्य काश्यप ने शुक्र-सम्प्रवर्तन आयु 16 वर्ष बताया है।

अतिबाला एवं अतिवृद्धा में गर्भधारण निषेध

ऊनषोडशवर्षायामप्राप्तः

यद्याधत्ते पुमान् गर्भं कुक्षिस्थः पञ्चविंशतिम् ।
स विपद्यते ॥

जातो वा न चिरं जीवेज्जीवेद्वा दुर्बलेन्द्रियः ।
तस्मादत्यन्तबालायां गर्भाधानं न कारयेत् ॥

(सु.सं.शा. 10/59-60)

16 वर्ष से कम आयु वाली कन्या में यदि 25 वर्ष से कम आयु वाला पुरुष गर्भाधान करता है तो वह गर्भ कुक्षि में ही मर जाता है, यदि बालक उत्पन्न भी हुआ तो वह बहुत दिनों तक जीवित नहीं रहता है, यदि जीवित भी रहा तो दुर्बलेन्द्रिय होता है। अतः अतिबाला में गर्भाधान नहीं करना चाहिए। उसी प्रकार अतिवृद्धा में भी गर्भाधान नहीं करना चाहिए।

इसी प्रकार वृद्धवाग्भट ने गर्भ का कुक्षि में विनाश अथवा जीवित रहने पर अल्पायु, अल्पबल, अल्पारोग्य एवं विकलेन्द्रिय वाला बालक होना बताया है।

वाग्भट के मत से न्यून आयु में मैथुन करने से उत्पन्न सन्तान रोगी, अल्पायु, आन्ध्य होता है अथवा गर्भ ठहरता ही नहीं है।

सामान्य मैथुन की स्थिति

तस्मादुत्ताना बीजं गृहीयात्; तथाहि यथास्थानमवतिष्ठन्ते दोषाः । (च.सं.शा. 8/6)

आचार्य चरक एवं वृद्ध वाग्भट ने स्त्री को उत्तान लेटकर मैथुन का निर्देश दिया है।

स्त्री को बीज ग्रहण के लिए उत्तान लेटकर मैथुन करना चाहिए इससे सभी दोष अपने स्थान पर स्थित रहते हैं।

मैथुन के लिए निषिद्ध स्थितियाँ एवं उत्पन्न दोष

न च न्युब्जां पार्श्वगतां वा संसेवेत । न्युब्जया वातो बलवान् स योनिं पीडयति, पार्श्वगताया दक्षिणे पार्श्वे श्लेष्मा स च्युतः पिदधाति गर्भाशयं, वामे पार्श्वे पित्तं तदस्याः पीडितं विदहति रक्तं शुक्रं च ।

(च.सं.शा. 8/6)

मैथुन स्थिति	दोष स्थिति	उत्पन्न लक्षण
न्युब्ज	वात बलवान	योनि में पीड़ा
वाम पार्श्व	पित्तपीडित	रक्त एवं शुक्र में विदाह
दक्षिणपार्श्व	श्लेष्माच्युत	विदधाति गर्भाशय (कफ के द्वारा गर्भाशय मुख बन्द होना)

अतः स्त्री को न्युब्ज एवं पार्श्व स्थिति में लेटकर मैथुन नहीं करना चाहिए।

तथा पुरुषोऽपि न चासावधस्तिष्ठेत् । तथा हि स्त्रीचेष्टाः पुमान् जायते पुंचेष्टा वा स्त्री ॥ न च न्युब्जां.....: (अ.सं.शा. 1/58-59)

आचार्य वृद्ध वाग्भट ने चरक के कथन का पालन किया है साथ ही पुरुष को नीचे रहकर मैथुन करने से निषेध

किया है क्योंकि यदि सन्तान पुरुष उत्पन्न हुआ तो वह स्त्री चेष्टा वाला तथा यदि स्त्री उत्पन्न हुई तो पुरुष के समान चेष्टा वाली होती है।

गर्भावक्रान्ति

तस्य (गर्भस्य) अवक्रान्तिरूपगमनमवतरणमिति यावद् गर्भावक्रान्ति । (डल्हण, सु.सं.शा. 3/3)

पुरुषस्यानुपहतरेतसः स्त्रियाश्चाप्रदुष्टयोनि.....होवाच भगवानाश्रेयः ॥ (च.सं.शा. 3/3)

तथा सह तथाभूतया यदा पुमानव्यापन्नबीजा.....गर्भाशयमनुप्रविश्यात्वेनाभिसंसर्गमेति ॥

(च.सं.शा. 4/7)

तत्र स्त्रीपुंसयो संयोगे तेजः शरीराद्.....गर्भाशयमनुप्रविश्यावतिष्ठते । (सु.सं.शा. 3/3)

गत पुराणे रजसि नवेऽवस्थिते शुद्धे गर्भास्याशये मार्गे.....॥ (अ.सं.शा. 2/3)

जहाँ गर्भ की अवक्रान्ति अर्थात् अवतरण-उत्पत्ति क्रम का वर्णन हो उसे गर्भवक्रान्ति कहा जाता है।

आचार्य चरकानुसार जब अदुष्ट या शुद्ध शुक्र वाला पुरुष अदुष्ट या शुद्ध योनि, आर्तव और गर्भाशय वाली स्त्री से ऋतुकाल में संसर्ग करता है तब गर्भाशय में शुक्र-शोणित के संयोग होने पर क्रियाशील मन के साथ होने से जीवान् गर्भ में प्रवेश करती है। वह गर्भ माता के प्रकृति के अनुकूल सात्म्य रसों के प्रयोग से और गर्भिणीचर्या में बनाए हुए नियमों के पालन से रोगरहित होकर गर्भाशय में वृद्धि करता है। इसके बाद समय से (9वें या 10वें मास में) सम्पूर्ण इन्द्रियों से युक्त, पूर्ण शरीरयुक्त, बल, वर्ण, मन और शरीर संहनन से युक्त होकर मातृज, पितृज, आत्मज, सात्म्य, रसज एवं सत्वज इन सभी भावों के समूह के सहयोग से सुखपूर्वक जन्म लेता है। अतः यह गर्भ मातृज, पितृज, आत्मज, सात्म्य, रसज और मन के नित्य सम्बन्ध से उत्पन्न होता है।

पुनः आचार्य ने कहा है कि जब अव्यापन्न (शुद्ध) शुक्र वाला पुरुष ऋतुमती स्त्री के साथ संयोग करता है तब उससे हर्ष से प्रेरित हुआ शरीर धातुओं का साररूप शुक्र बीज रूप में निकलकर योनिमार्ग द्वारा गर्भाशय में प्रविष्ट कर आर्तव के साथ मिलाकर गर्भ की उत्पत्ति करता है।

आचार्य सुश्रुत ने वर्णन किया है कि स्त्री-पुरुष के संयोग से उत्पन्न तेज (उष्मा) वायु को बढ़ाता है। तत्पश्चात् तेज और वायु मिलकर स्थान से च्युत शुक्र को योनि (अथवा गर्भाशय) में ले जाते हैं, वहाँ आर्तव से वह वीर्य मिलकर अग्नि एवं सोम के साथ गर्भ को प्राप्त होता है। वहाँ क्षेत्रज्ञ, वेदयिता, स्पृष्टा, घ्राता, द्रष्टा, श्रोता, रसयिता, पुरुष, स्वप्न, गन्ता, साक्षी, धाता, वक्ता इत्यादि पर्यायवाची शब्दों से जाना जाने वाला अक्षय, अव्यय, अचिन्त्य आत्मा देवसंयोग से पञ्चमहाभूतों, सत्व, रज, तम, दैव, असुर तथा अन्य दूसरे भावों से मिलता हुआ, वायु से प्रेरित होकर गर्भाशय में प्रविष्ट होकर रहता है।

आचार्य वृद्ध वाग्भट के अनुसार पुराण रज के समाप्त हो जाने एवं नूतन रज के स्थित हो जाने पर, गर्भाशय और योनिमार्ग के शुद्ध हो जाने पर बीज रूप में अविकृत शुक्र अविकृत वायु से प्रेरित होकर, पंचमहाभूतों से अनुगत हो आर्तव से मिश्रित होता है, तत्क्षण रागादि पञ्चक्लेशों के वशीभूत तथा स्वकर्म (पूर्वजन्म के कर्म) से प्रेरित हो मन के वेग के लक्षण जीव से मिश्रित हो गर्भाशय में आता है।

आचार्यवाग्भट के अनुसार—

शुद्धे शुक्रार्तवे सत्त्वः स्वकर्मक्लेशचोदितः ।
गर्भ सम्पद्यते युक्तियशादग्रिवारणी ॥ (अ.ह.शा. 1/1)

शुक्र और आर्तव के शुद्ध होने पर अपने कर्मों के अनुसार क्लेश से प्रेरित हुआ सत्व (मन) युक्ति के अर्थात् बनकर गर्भरूप हो जाता है, जिस प्रकार अरणी में अग्नि युक्ति से बन जाती है।

जिस प्रकार सूर्य की किरणों का तेज स्फटिक (सूर्यकान्तमणि) के बीच से इन्धन में जाता हुआ नेत्र से दिखाई नहीं देता, उसी प्रकार गर्भाशय में जाता हुआ सत्व दिखाई नहीं देता है।

आचार्य भावमिश्र ने सुश्रुत एवं वाग्भट दोनों के तथ्यों का अनुसरण किया है।

आचार्य हारीत के अनुसार—

.....दृश्यते न विना योगात्फलं स्त्रीणां तु पुत्रक । (हा.सं.षष्ठस्थान 1/10)

• सर्वप्रथम धातु बल, धातु बल से सत्व, सत्व से रज, रज से काम तथा काम से स्त्री प्रसंग होता है।

• विना योग (मैथुन) के स्त्रियों में फल (गर्भ) की प्राप्ति नहीं होती है।

आचार्य भेल के अनुसार, वायु स्त्री के योनि में आए हुए शुक्र को ग्रहण कर, शुद्ध आर्तव से मिलाकर स्त्री को गर्भ युक्त या गर्भिणी कर देती है।

गर्भसम्भव सामग्री (गर्भोत्पत्ति हेतु आवश्यक घटक)

ध्रुवं चतुर्णां सन्निध्यात् गर्भः स्याद् विधिपूर्वकः।

ऋतुक्षेत्राम्बुबीजानां सामग्रयादङ्कुरो यथा ॥ (सु.सं.शा. 2/35)

निपातादेव गृह्णाति रागं वासोयथाऽमलम् ।

ध्रुवं गभे तथा बीजं क्षेत्रं बीजभुपस्कृतम् ॥ (अ.सं.शा. 1/68)

शुद्धे गर्भाशये मार्गे रक्ते शुक्रेऽनिले हृदि ।

वीर्यवन्तं सुतं सूते.....॥ (अ.ह.शा. 1/8-9)

.....ऋतुर्बीजकालमवेक्षत.....॥ (अ.ह.शा. 1/8-9)

सुश्रुत	डल्हण	वृद्ध वाग्भट	वाग्भट	काश्यप
ऋतु क्षेत्र	रजःकाल गर्भाशय	बीज बीज से उपस्कृत क्षेत्र	शुद्ध गर्भाशय शुद्ध मार्ग (अपत्यमार्ग) शुद्ध रक्त (स्त्री बीज) शुद्ध शुक्र (पुंबीज)	ऋतुकाल बीज
अम्बु	आहार पाकोत्पन्न		शुद्ध अनिल (अपान वायु)	
बीज	रस धातु स्त्री आर्तव एवं पुरुष शुक्र		शुद्ध हृदय	

पुत्र या पुत्री की प्राप्ति हेतु मैथुन दिवस

स्नानात् प्रभृति युग्मेष्वहःसु पुत्रकामौ, अयुग्मेषु दुहितृकामौ । (च.सं.शा. 8/5)

युग्मेष्वहःसु पुत्रकामोऽन्यत्र कन्यार्थी हर्षितस्तृप्तोऽनुरुद्धः (अनुरक्तः-शु.पा.) स्त्रियमुपेयादिति सिद्धम् ॥
(का.सं.शा. 5/6)

आचार्य चरक एवं काश्यप— युग्म दिवस में मैथुन → पुत्र की उत्पत्ति
अयुग्म दिवस में मैथुन → पुत्री की उत्पत्ति

विकल्प्यैवं चतुर्थ्या षष्ठ्यामष्टम्यां दशमं द्वादश्यां चोपेयादिति पुत्रकामः ॥ (सु.सं.शा. 2/28)
अतः परं पञ्चम्यां सप्तम्यां नवम्यामेकादश्यां च स्त्रीकामः । त्रयोदशीप्रभृतयो निन्द्याः ।
(सु.सं.शा. 2/30)

आचार्य सुश्रुत—युग्म दिन → 4, 6, 8, 10, 12वें दिन → पुत्र
अन्य दिन → 5, 7, 9, 11वें दिन → पुत्री
त्रयोदशी आदि निन्द है।

ततः स्नानात्पुनरपि गुणवत्पुत्रार्थी चतुरात्रमुपेक्षेत । पुष्पदिनात्सप्तरात्रम् ॥
अथाष्टम्यां दशम्यां द्वादश्यां वा रात्रौ पुत्रकामः संविशेत् । पञ्चम्यां सप्तम्यां नवम्यां वा दुहितृकामः ॥
(अ.सं.शा. 1/47-48)

वृद्ध वाग्भट ने गुणवान पुत्रोत्पत्ति हेतु स्नान के बाद 4 रात्रि अर्थात् पुष्पदर्शन से 7 दिन तक संभोग न करने का निर्देश दिया है।

8, 10, 12वें दिन → पुत्र
5, 7, 9वें दिन → पुत्री
11, 13वें दिन → नपुसंक

ऋतुस्तु द्वादशनिशाः पूर्वास्तिस्त्रोऽत्र निन्दिताः । एकादशी च युग्मासु स्यात्पुत्रोऽन्यासु कन्यका ॥
(अ.ह.शा. 1/27-28)

वाग्भट ने 12 दिन के ऋतुकाल में प्रथम 3 दिन और 11वां दिन निन्दित बताया है।

युग्म रात्रि → पुत्र
अयुग्म रात्रि → पुत्री

यहाँ अरुणदत्त ने 13वें दिन (त्रयोदशी) को भी निन्दित माना है।

महर्षि भेल— षष्ठी, अष्टमी आदि → पुत्र
पंचमी आदि → पुत्री

युग्मायुग्म आदि दिवसों में संभोग से पुत्र-पुत्री के उत्पत्ति का कारण

आचार्य वृद्ध वाग्भट के अनुसार—युग्म रात्रियों में स्त्री में आर्तव अल्प रहता है इसलिए पुत्र की उत्पत्ति तथा अयुग्म रात्रियों में आर्तव की अधिकता रहती है अतः पुत्री की उत्पत्ति होती है।

यदि कभी आहार की उत्तमता के कारण पुरुष में अयुग्म दिनों में शुक्र की अधिकता हो जाए तो जो पुत्र उत्पन्न होगा वह स्त्री आकृति वाला, दुर्बल अथवा हीन अंगों वाला होगा तथा युग्म दिनों में शुक्र की न्यूनता हो तो जो कन्या उत्पन्न होगी वह पुरुषाकृति वाली, दुर्बल एवं हीमांगो वाली होगी।

आचार्य डल्हण ने शुक्र बाहुल्य से पुरुष तथा आर्तव बाहुल्य से स्त्री की उत्पत्ति बताई है। साथ ही युग्मायुग्म के वर्णन हेतु विदेह तथा भोज का मत प्रस्तुत किया है—

विदेह के अनुसार → युग्म दिनों में रज अल्प होने से पुत्र प्रसव
अयुग्म दिनों में रज अधिक होने से कन्या प्रसव

भोज के अनुसार → युग्म दिवस तथा शुक्र बाहुल्य से पुमान्
अयुग्म दिवस तथा रज बाहुल्य से कन्या
संध्या में तथा शुक्रशोणित के साम्य से नपुंसक

पुत्रीय विधान

पुत्रीय विधि के पालन से उत्पन्न पुत्र रूपवान, सत्यवान, चिरायु, माता-पिता के ऋण का मोचन करने वाला सुपुत्र होता है। वाग्भट्ट ने महागुणी पुत्र उत्पत्ति के लिये पूर्वजन्म कर्मफल को भी कारण मानते हुये पुत्रीय विधि का पालन करने का निर्देश दिया है।

संहिताओं में सभी आचार्यों ने इच्छित गर्भ की प्राप्ति के लिए पुत्रीय विधि का वर्णन किया है—

- उपाध्याय द्वारा विधान कराने का वर्णन है।
- पुत्रीय विधि के प्रयोग से बन्ध्या स्त्री को भी वांक्षित पुत्र की प्राप्ति होती है।

यज्ञपूर्वकर्म

महर्षि चरक ने स्त्री-पुरुष को स्नेहन, स्वेदन के पश्चात् वमन, विरेचन द्वारा शरीर की शुद्धि हो जाने के बाद आस्थापन तथा अनुवासन बस्ति का प्रयोग करने का निर्देश दिया है। इसके पश्चात् पुरुष मधुर वर्ग की औषधियों से सिद्ध घृत एवं क्षीर तथा स्त्री तैल एवं माष का सेवन करे।

महर्षि सुश्रुत ने स्त्री एवं पुरुष को एक मास तक ब्रह्मचर्य का पालन करने के पश्चात् पुरुष को घृत स्निग्ध कराकर घृत एवं क्षीर युक्त षष्टि चावल तथा स्त्री को तैल से स्निग्ध कराकर तैल एवं माष-भूयिष्ठ भोजन का निर्देश दिया है।

वाग्भट्टद्वय ने भी आचार्य चरक एवं सुश्रुत के कथनों का वर्णन किया है।

महर्षि काश्यप ने चरकानुसार वर्णन किया है।

पुत्रेष्टि यज्ञ या काम्येष्टि यज्ञ

- चरक संहिता एवं काश्यप संहिता में पुत्रेष्टि यज्ञ की विधि का विस्तृत रूप में वर्णन है।
- पुत्रेष्टि यज्ञ के पश्चात् मंत्र का उच्चारण करने के बाद विधिपूर्वक मैथुन का निर्देश दिया है।
- शुद्र वर्ण की स्त्री के लिए मंत्र का प्रयोग निषेध किया है।
- मैथुन के पश्चात् शीतोदक से परिषेचन करना चाहिए।

• आचार्य भावमिश्र ने गर्भाधान के लिए संसर्ग के बाद एक मास तक पुनः संसर्ग नहीं करने का निर्देश दिया है।

गर्भ के षड्धातु

गर्भस्तु खल्वन्तरिक्षवाय्वग्नितोयभूमिविकारश्चेतनाधिष्ठानभूतः । एवमनया युक्त्या पञ्चमहाभूत-
विकारसमुदायात्मको गर्भश्चेतनाधिष्ठानभूतः, स ह्यस्य षष्ठो धातुरुक्तः ॥ (च.सं.शा. 4/6)

गर्भ आकाश, वायु, अग्नि, जल और पृथ्वी इन पंचमहाभूतों का विकार है और चेतना का आश्रयभूत है। इसी युक्ति से पंचमहाभूतों के विकारों का समुदायात्मक यह गर्भ चेतना का अधिष्ठानभूत है। अतः पंचमहाभूत के साथ चेतना धातु को गर्भ का षड्धातु कहा गया है। गर्भ की छठी धातु "चेतना" कही गई है।

आचार्य भावमिश्र ने गर्भ के जीवन हेतु पंचमहाभूत एवं भूतात्मा के साथ सत्व, रज, तम तथा पञ्चेन्द्रियों का भी वर्णन किया है।

गर्भ के षड्भाव

.....सर्वेभ्य एभ्यो भावेभ्यः समुदितेभ्यो गर्भोऽभिनिर्वर्तते ॥ (च.सं.शा. 3/5)

मातृतः पितृतः आत्मतः सात्म्यतो रसतः सत्त्वत इत्येतेभ्यो भावेभ्यः समुदितेभ्यो गर्भः संभवति ।
(च.सं.शा. 4/4)

इन सभी भावों अर्थात् मातृत्व, पितृत्व, आत्मत्व, सात्म्य, रसत्व और सत्त्व के समुदाय से गर्भ की उत्पत्ति होती है।

यानि खल्वस्य गर्भस्य मातृजानि, यानि चास्य मातृतः संभवतः संभवन्ति, तान्यनुव्याख्यास्यामः । तद्यथा—त्वक्॥भक्तिः शीलं शौचं द्वेषः स्मृतिर्मोहस्त्यागो मात्सर्यं शौर्यं भयं क्रोधस्तन्द्रोत्साहस्तैक्षण्यं मार्दवं गाम्भीर्यमनवस्थितत्वमित्येवमादयश्चान्ये, ते सत्त्वविकारा यानुत्तरकांत सत्त्वभेदमधिकृत्योपदेक्ष्यामः । नानाविधानि खलु सत्त्वानि, तानि सर्वाण्येकपुरुषे भवन्ति, न च भवन्त्येककालम्, एकं तु प्रायोवृत्त्याऽऽह ॥ (च.सं.शा. 3/6-13)

मातृजभाव	पितृजभाव	आत्मजभाव	सात्म्यजभाव	रसजभाव	सत्त्वजभाव
त्वक्	केश	विभिन्न योनियों	आरोग्य	शरीर-	भक्ति
लोहित	शमश्रु	में उत्पत्ति	अनालस्य	अभिनिर्वृति	शील
मांस	नख	आयु	अलोलुपत्व	शरीर-	शौच
मंद	लोम	आत्मज्ञान	इन्द्रियप्रसाद	अभिवृद्धि	द्वेष
नाभि	दन्त	मन	स्वरसंपत्	प्राणानुबन्ध	स्मृति
हृदय	अस्थि	इन्द्रियाँ	वर्णसंपत्	तृप्ति	मोह
क्लोम	सिरा	प्राण	बीजसंपत्	पुष्टि	त्याग
यकृत	स्नायु	अपान	प्रहर्षाधिक्य	उत्साह	मात्सर्य
प्लीहा	धमनी	प्रेरण			शौर्य

वृक्क वस्ति पुरीषाधान आमाशय पक्वाशय उत्तरगुद अधरगुद क्षुद्रान्त्र स्थूलान्त्र वपा वपावहन	शुक्र	धारण आकृति विशेष स्वर विशेष वर्ण विशेष सुख-दुःख इच्छा-द्वेष चेतना धृति बुद्धि स्मृति अहंकार प्रयत्न			भय क्रोध तन्द्रा उत्साह तैश्चय मार्दव गाम्भीर्य अनवस्थितत्व अन्य भाव
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आचार्य सुश्रुत ने इन भावों को गर्भ शारीरिक लक्षण नाम से वर्णन किया है तथा सत्वज भाव की व्याख्या आगे (गर्भव्याकरण अध्याय) में किया है जहाँ सात्विक, राजसिक एवं तामसिक प्रकृतियों का वर्णन है।

तत्र गर्भस्य पितृज-मातृज-रसजात्मज सत्त्वजसात्म्यजानि शरीरलक्षणानि व्याख्यास्यामः । गर्भस्य, केश-श्मश्रु-लोमा-स्थि-नख-दन्तसिरा स्नायु-धमनी-रेतः प्रभृतीनि स्थिराणि पितृजानि । मांस-शोणित-मेदो-मज्ज-हृत्नाभि-यकृत-प्लीहान्त्र-गुदप्रभृतीनि मृदूनि मातृजानि । शरीरोपचयो बलं वर्णः स्थितिर्हानिश्च रसजानि । इन्द्रियाणि ज्ञानं विज्ञानमायुः सुखं दुःखादिकं चात्मजानि । सत्त्वजान्युत्तरत्र वक्ष्यामः । वीर्यमारोग्यं बलवर्णौ मेधा च सात्म्यजानि ॥ (सु.सं.शा. 3/31)

पितृज	मातृज	रसज	आत्मज	सात्म्यज
केश	मांस	शरीरोपचय	एकादश इन्द्रियाँ	वीर्य
श्मश्रु	शोणित	बल	ज्ञान	आयोग्य
लोम	मेद	वर्ण	विज्ञान	बल
अस्थि	मज्जा	स्थिति	आयु	वर्ण
नख	हृदय	हानि	सुख	मेधा
दन्त	नाभि		दुःख इत्यादि	
सिरा	यकृत			
स्नायु	प्लीहा			
धमनी	आन्त्र			
रेत	गुद आदि, मृदु भाग			

आचार्य वाग्भट द्वय ने इन षड्भावों के साथ राजस एवं तामस भावों का भी वर्णन किया है।

आचार्य वृद्ध वाग्भट के अनुसार (अ.सं.शा. 5/14-21) —

मातृज	पितृज	आत्मज	सात्म्य	रसज	सत्वज	राजस	तामस
त्वक् रक्त मेद मज्जा नाभि हृदय आमाशय गर्भाशय यकृत प्लीहा क्लोम आंत्र गुदा आदि (मृदु अंग)	केश नख अस्थि शुक्र सिरा स्नायु आदि कठोर अंग	विभिन्न योनियों में उत्पत्ति मन इन्द्रियाँ प्राण अपान धारण आकृति- विशेष स्वर- विशेष वर्ण- विशेष काम क्रोध लोभ भय हर्ष धर्म-अधर्म स्मृति बुद्धि इच्छा द्वेष प्रयत्न अहंकार सुख दुःख आयु आत्मज्ञान	आयु आरोग्य अनालस्य अलोलुपता इन्द्रिय- प्रसाद स्वर-वर्ण- बीज-ओज सम्पत् एवं प्रशस्तता प्रहर्षान्धिय मेधाबल	सम्पूर्ण शरीर की उत्पत्ति वृत्ति वृद्धि तृप्ति अलौल्य पुष्टि उत्साह	शौच आस्तिकत्व कृतज्ञता दाक्षिणत्व व्यवसाय शौर्य गाम्भीर्य बुद्धि मेधा स्मृति शुक्लता धर्मरुचि भक्ति अनभिष्वङ्ग तमोगुण विपरीत लक्षण	दुरूप- चारता अनार्यत्व शौर्य मात्सर्य बहुत बोलना अहंकार लोलुपत्व दम्भ मान क्रोध हर्ष काम	अज्ञान विषाद प्रमाद निद्रा आलस्य क्षुत् तृष्णा शोक मात्सर्य विप्रतिपत्ति पराभि- सन्धान सत्वगुण विपरीत लक्षण

आचार्य वाग्भट के अनुसार (अ.ह.शा. 3/4-8)

मातृज	पितृज	आत्मज	सात्म्यज	रसज	सत्यज	राजस	तामस
रक्त मांस मज्जा गुदा आदि	शुक्र धमनी अस्थि बालादि स्थिरभाग	चित्त इन्द्रिय नानायोनि में जन्म	आयु आरोग्य अनालस्य प्रभा बल	वपुजन्म वृत्ति वृद्धि अलौल्य	शौच आस्तिकता धर्मरुचि मति	बहुभाषित्व मान क्रोध दम्भ मत्सर	भय अज्ञान निद्रा आलस्य विषाद

गर्भ का पंचभौतिकत्व

महाभूतविकारप्रविभागेन त्विदानीमस्य तांश्चैवाङ्गावयवान् कांश्चित् पर्यायान्तरेण..... ।
मातृजादयोऽप्यस्य महाभूतविकारा एव । तत्रास्याकारात्मक....मूर्तिश्चेति ॥ (च.सं.शा. 4/12)
आचार्यों ने पञ्चमहाभूतों के विकार के विभाग के अनुसार, मातृजादि कुछ अंगावयवों की और अन्य अंगावयवों के भी पर्याय का व्याख्या किया है। मातृजादि जो भाव शरीर में बनते हैं वे सभी भाव पञ्चमहाभूत के विकार स्वरूप ही होते

	आकाशात्मक भाव	वाय्वात्मक भाव	अग्न्यात्मक भाव	अबात्मक भाव	क्षित्यात्मक भाव
(च.सं. शा.4/12)	शब्द, श्रोत, लघुता, सूक्ष्मता, विवेक	स्पर्श, स्पर्शनिन्द्रिय, रुक्षता, प्रेरणा, धातु-व्यूहन, चेष्टाएँ	रूप, चक्षुरिन्द्रिय प्रकाश, पाचन उष्णता	रस, रसनेन्द्रिय शैत्य, मार्दव, स्नेह, क्लेद	गंध, घ्राण, गौरव, स्थैर्य, मूर्ति
(सु.स. शा. 1/26)	शब्द, शब्देन्द्रिय, सर्वच्छिद्र समूह, विविक्तता	स्पर्श, स्पर्शनिन्द्रिय, सर्वचेष्टा समूह, सर्वशरीर स्पन्दन, लघुता	रूप, रूपेन्द्रिय, वर्ण, सन्ताप, भ्राजिष्णुता, पक्ति, अमर्ष, तैक्षण्य, शौर्य	रस, रसेन्द्रिय, सर्वद्रवसमूह, गुरुता, शैत्य, स्नेह, रेत	गंध, गंधेन्द्रिय, सर्वमूर्तसमूह, गुरुता
(अ.सं. शा.5/9-13)	श्रोत, शब्द, श्रोतस, विविक्त	स्पर्श, स्पर्शनिन्द्रिय, प्रश्वास, उच्छ्वास, परिस्पन्दन, लाघव	रूप, दशनेन्द्रिय, पित्त, उष्मा, पक्ति, सन्ताप, मेधा, वर्ण, भा (कान्ति), तेज, शौर्य	रस, रसनेन्द्रिय, स्वेद, क्लेद, वसा, असृक्, शुक्र, मूत्रादि द्रव समूह, शैथिल्य, स्नेह	गंध, घ्राण, केश, नख, अस्थि आदि मूर्तसमूह, धैर्य, गौरव
(अ.ह. शा.1/3-4)	शरीर-छिद्र (ख), श्रोत, शब्द विविक्तता,	स्पर्श, त्वक्, उच्छ्वास	दृग्, रूप, पक्ति	जिह्वा, रस, क्लेद	घ्राण, गन्ध, अस्थि

(का.सं. शा. 3/4)	शब्द, श्रोत, लाघव, सौक्ष्म्य, विवेक, मुख, कण्ठ, कोष्ठ	स्पर्शन, रौक्ष्य, प्रेरण, धातुव्यूहन, प्राण-अपान, शरीर चेष्टा	चक्षु, रूप, प्रकाश, पित्त, पक्ति, उष्मा, शरीर वृद्धि	रस, रसन, शैत्य, मार्दव, द्रव, स्नेह, क्लेद, श्लेष्मा, मेद, रक्त, मांस, शुक्र	गन्ध, घ्राण, गौरव, स्थैर्य, मूर्ति
(हा.सं. षष्ठ. 1/ 42-44)	मन, बुद्धि, निद्रा, आलस्य, मद	कर्ण, स्पर्श, उच्छ्वास, स्वेद, चक्रमण	पित्त, नेत्र, तम, क्रोध, मोह	रस, रक्त, लाला, मूत्र, शक्र	त्वचा, मांस, केश, रोम अस्थि

आचार्य सुश्रुत एवं अष्टांगहृदयकार ने इन्हें पंचमहाभूतों के गुण के रूप में वर्णन किया है।

गर्भ-वृद्धि में पञ्चमहाभूतों के कार्य

तं चेतनावस्थितं वायुर्विभजति, तेज एनं पचति, आपः क्लेदयन्ति, पृथिवी संहन्ति, आकाशं विवर्धयति। (सु.सं.शा. 5/3)

- वायु - गर्भ में दोष, धातु, मल, अंग-प्रत्यंग आदि का विभाजन।
- अग्नि - गर्भ में पाचन करके रूप से रूपान्तर की अवस्था को प्राप्त कराता है।
- जल - गर्भ में क्लेदन करता है अर्थात् वायु के द्वारा विभाग के कारण तथा अग्नि से उत्पन्न शोषण की अट्टन करता है।
- पृथ्वी - गर्भ में संहनन करती है अर्थात् जल से क्लिन्न गर्भ को काठिन्य प्रदान कर मूर्तिमान बनता है।
- आकाश - विवर्धन करता है अर्थात् वायु एवं अग्नि के द्वारा विदारित तथा ऊर्ध्व, अधः तथा तिर्यक् ओर बढ़े हुए स्रोतसों में आध्मापन द्वारा अवकाश देकर विवर्धन करता है।

गर्भ में मन आत्मा एवं पञ्चमहाभूतों की उत्पत्ति का क्रम

तत्र पूर्वं चेतनाधातुः सत्त्वकरणो गुणग्रहणाय प्रवर्तते.....स गुणोपादान-कालेऽन्तरिक्षं पूर्वतरमन्येभ्यः गुणेभ्य उपादत्ते,.....तथा देहग्रहणेऽपि प्रवर्तमानः पूर्वतरमाकाशमेवोपादत्ते, ततः क्रमेण व्यक्ततरगुणाः धातून् वाय्वादिकांश्चतुरः । सर्वमपि तु खल्वेतद्गुणोपादानमणुना कालेन भवति ॥ (च.सं.शा. 4/8)

सर्व प्रथम सत्त्व का आधार लेकर चेतना धातु गुण ग्रहण करने के लिए प्रवृत्त होती है। यह आत्मा गुण ग्रहण करने के समय सर्वप्रथम आकाश का निर्माण करता है। तत्पश्चात् क्रमशः व्यक्ततर गुण वाले वायु आदि चारो महाभूतों की सृष्टि करता है। आत्मा सर्वप्रथम आकाश ही ग्रहण करता है, तत्पश्चात् क्रम से व्यक्ततर गुण वाले वायु आदि चारो धातुओं को ग्रहण करता है। इन सभी गुणों (महाभूतों) का उपादान या ग्रहण बहुत ही अल्प काल में हो जाता है।

गर्भ की मासानुमासिक वृद्धि

प्रथम मास

स सर्वगुणवान् गर्भत्वमापन्नः प्रथमे मासि समूर्च्छितः सर्वधातुकलुपीकृतः खेटभूतो भवत्यव्यक्तविग्रहः
सदसद्भूताङ्गावयवः ॥ (च.सं.शा. 4/9)

तत्र प्रथमे मासि कललं जायते ॥ (सु.सं.शा. 3/18)

तत्र प्रथमे मासे कललं जायते ॥ (अ.स.शा. 2/13)

अव्यक्तः प्रथमे मासि सप्ताहात्कलली भवेत् ॥ (अ.ह.शा. 1/37)

आचार्य चरक— वह सर्वगुणवान् आत्मा गर्भत्व को प्राप्त होकर सभी धातुओं (पञ्चमहाभूतों) से कलुपित या मिश्रित होकर खेटभूत या श्लेष्मा सदृश होकर सत्-असत् अङ्गावयव (सूक्ष्मरूप में अङ्गावयव की उपस्थिति एवं स्थूलरूप में अनुपस्थिति) वाले अव्यक्त शरीर वाला होता है ।

आचार्य सुश्रुत— कलल

आचार्य वृद्ध वाग्भट— कलल

आचार्य वाग्भट— एक सप्ताह के बाद कलल-स्वरूप अव्यक्तावस्था में रहता है । टीकाकार अरुणदत्त ने एक सप्ताह के पूर्व के गर्भ को श्लेष्म-पिण्डीभूत माना है ।

आचार्य हारीत—

- पहले दिन कलल (रूप गर्भ) बनता है।
- दस दिन में शोणित (रेत एवं शोणित मिश्रित गर्भ) बुद्बुदाकार हो जाता है।
- पन्द्रह दिन में घन।
- बीस दिन में मांसपिण्ड-रूप।
- पच्चीस दिन पर पञ्चभूतात्मक।
- एक महीने में पाँचों तत्व उत्पन्न या स्पष्टतर हो जाते हैं ।

आचार्य भावमिश्र— उसी रूप (अर्थात् द्रवरूप) में ही गर्भ रहता है ।

द्वितीय मास

द्वितीये मासि घनः संपद्यते पिण्डः, पेश्यर्बुदं वा । तत्र घनः पुरुषः, पेशी स्त्री, अर्बुदं नपुंसकम् ॥
(च.सं.शा. 4/10)

द्वितीये शीतोष्मानिलैरभिप्रपच्यमानानां महाभूतानां संघातो घनः सञ्जायते यदि पिण्डः पुमान्, स्त्री चेत् पेशी, नपुंसकं चेदर्बुदमिति । (सु.सं.शा. 3/15)

द्वितीये मासि कललाद्धनः पेश्यथवाऽर्बुदम् ॥ (अ.स.शा. 2/13)

द्वितीये मासि कललाद्धनः पेश्यथवाऽर्बुदम् ।

पुंस्त्रीक्लीबाः क्रमात्तेभ्यः..... ॥ (अ.ह.शा. 1/49-50)

आचार्य चरक- पिण्ड, पेशी या अर्बुद आकार तथा घन (कठिन) रूप रहता है ।

घन (पिण्डाकार) होने पर पुरुष, पेशी आकार होने पर स्त्री तथा अर्बुदाकार होने पर नपुंसक गर्भ होता है ।

आचार्य सुश्रुत, वृद्ध वाग्भट, वाग्भट एवं भावमिश्र- घन, पेशी, अर्बुद होने से क्रमशः पुरुष, स्त्री एवं नपुंसक की उत्पत्ति ।

आचार्य हारीत- 50 दिनों में गर्भ अकुरों की उत्पत्ति ।

तृतीय मास

तृतीये मासि सर्वेन्द्रियाणि सर्वाङ्गावयवाश्च यौगपद्येनाभिनिर्वर्तन्ते ॥ (च.सं.शा. 4/11)

तृतीये हस्तपादशिरसां पञ्च पिण्डका निर्वर्तन्तेऽङ्गप्रत्यङ्गविभागश्च सूक्ष्मो भवति । (सु.सं.शा. 3/15)

तृतीये पञ्चधा प्ररोहति; तद्यथा-सक्थिनी बाहू शिरश्च । सक्थ्यादिप्ररोहैककालमेव च सर्वाङ्गावयवेन्द्रियाणि युगपत्सम्भवन्ति ॥ (अ.सं.शा. 2/13)

व्यक्ती भवति मासेऽस्य तृतीये गात्रपञ्चकम् ॥
मूर्धा द्वे सक्थिनीबाहू सर्वसूक्ष्माङ्गजन्म च ।
सर्वमेव हि मूर्धाद्यैर्ज्ञानं च सुःखदुःखयोः ॥

(अ.ह.शा. 1/54-55)

तृतीये मासि युगपन्निर्वर्तन्ते यथाक्रम ।
प्रस्पन्दते चेतयति वेदनाश्चावबुद्ध्यते ॥
सूक्ष्मप्रव्यक्तकरणस्तृतीये तु मनोऽधिकः ॥

(का.सं.शा. 2/4-5)

आचार्य चरक- सभी इन्द्रियाँ एवं अंगावयव एक साथ उत्पन्न होते हैं ।

आचार्य सुश्रुत- पंच पिण्डका— दो हाथ, दो पैर एवं शिर की उत्पत्ति, अंग प्रत्यंग का विभाग सूक्ष्म होता है ।

आचार्य वृद्ध वाग्भट- पंच प्ररोह— दो हाथ, दो पैर एवं शिर की उत्पत्ति, सभी अंगव्यव एवं इन्द्रियाँ एक साथ उत्पन्न ।

आचार्य वाग्भट- गात्रपंचक (शिर, दोनों पैर, दोनों बाहु) की उत्पत्ति, गर्भ को सुख-दुख का ज्ञान होता है ।

आचार्य काश्यप- सभी अंगों की एक साथ उत्पत्ति, गर्भ प्रस्पन्दन, चेतना एवं वेदना का ज्ञान करने वाला होता है । अंगों का सूक्ष्म अंग-प्रत्यंग-विभाग, विशेषकर मन की अधिक अभिव्यक्ति होती है ।

आचार्य हारीत- हस्तपाद का प्रवर्धन ।

आचार्य भावमिश्र- पंचण्डिका एवं सूक्ष्म अंगाव्यव की उत्पत्ति ।

टीकाकार चक्रपाणि- केश की उत्पत्ति ।

चतुर्थ मास

चतुर्थे मासि स्थिरत्वमापद्यते गर्भः । (च.सं.शा. 4/20)

चतुर्थे सर्वाङ्गप्रत्यङ्गविभागः प्रव्यक्तो भवति, गर्भहृदयप्रव्यक्तिभावाच्चेतनाधातुरभिव्यक्तो भवति ।
(सु.सं.शा. 3/15)

चतुर्थेऽङ्गप्रत्यङ्गविभागः प्रव्यक्तो गर्भश्च स्थिरो भवति ॥ (अ.सं.शा. 2/22)

चतुर्थे व्यक्तताऽङ्गानां..... ॥ (अ.ह.शा. 1/54-55)

चतुर्थे स्थिरतां याति गर्भः कुक्षौ निरामयः ॥ (का.सं.शा. 2/5)

आचार्य चरक- गर्भ में स्थिरता आ जाती है ।

आचार्य सुश्रुत- अङ्ग-प्रत्यङ्ग का विभाग स्पष्ट हो जाता है, गर्भ के हृदय के व्यक्त होने से चेतना धातु अभिव्यक्त होती है क्योंकि उसका (चेतना का) स्थान हृदय है ।

आचार्य वृद्ध वाग्भट- अङ्ग-प्रत्यङ्ग के विभाग में स्पष्टतरता एवं गर्भ में स्थिरता आती है ।

आचार्य वाग्भट- अंगों में व्यक्तता आ जाती है ।

आचार्य काश्यप- गर्भ निरुपद्रव रूप से कुक्षि में स्थिर रहता है ।

आचार्य हारीत- साढ़े तीन मास में शिर के सारवत एवं चतुर्थ मास में लोम की उत्पत्ति बताया है ।

आचार्य भावमिश्र- अङ्ग-प्रत्यङ्ग की उत्पत्ति एवं हृदय तथा चेतना की व्यक्तता का वर्णन दिया है ।

पञ्चम मास

पञ्चमे मासि गर्भस्य मांसशोणितोपचयो भवत्यधिकमन्येभ्यो मासेभ्यः । (च.सं.शा. 4/21)

पञ्चमे मनः प्रतिबुद्धतरं भवति । (सु.सं.शा. 3/28)

पञ्चमे मनः प्रतिबुद्धतरं भवति मांसशोणितोपचयश्च ॥ (अ.सं.शा. 2/23)

.....चेतनायाश्च पञ्चमे ॥ (अ.ह.शा. 1/54-55)

मांसशोणितवृद्धिस्तु पञ्चमे मासि जीवक ॥ (का.सं.शा. 2/6)

आचार्य चरक- अन्य मासों की अपेक्षा मांस एवं शोणित का अधिक उपचय होता है ।

आचार्य सुश्रुत- मन प्रतिबुद्धतर होता है अर्थात् जागृत होता है ।

आचार्य वृद्ध वाग्भट- मन की प्रतिबुद्धता एवं मांस तथा शोणित का उपचय ।

आचार्य वाग्भट- चेतना की उत्पत्ति ।

आचार्य काश्यप- मांस एवं शोणित की वृद्धि ।

आचार्य हारीत- गर्भ सुजीव हो जाता है ।

आचार्य भावमिश्र- मन की प्रतिबुद्धता ।

षष्ठ मास

षष्ठे मासि गर्भस्य बलवर्णोपचयो भवत्यधिकमन्येभ्यो मासेभ्यः । (च.सं.शा. 4/22)

REMI NOTE 6 PRO
DUAL LEARNER

षष्ठे बुद्धिः। (सु.सं.शा. 3/28)

षष्ठे केशरोमनखास्थिसनाय्वादीन्यभिव्यक्तानि बलवर्णोपचयश्च ॥ (अ.सं.शा. 2/24)

षष्ठे स्नायुसिरारोमबलवर्णनखत्वचाम् ॥ (अ.ह.शा. 1/57)

बलवर्णोजसां वृद्धिः षष्ठे..... ॥ (का.सं.शा. 2/7)

आचार्य चरक- बल एवं वर्ण का उपचय अन्य मासों की अपेक्षा अधिक होता है ।

आचार्य सुश्रुत- बुद्धि की प्राप्ति ।

आचार्य वृद्ध वाग्भट- केश, रोम, नख, अस्थि एवं स्नायु आदि की अभिव्यक्ति एवं बल, वर्ण का उपचय

आचार्य वाग्भट- स्नायु, सिरा, रोम, बल, वर्ण, नख एवं त्वचा की उत्पत्ति।

आचार्य काश्यप- बल, वर्ण एवं ओज की वृद्धि।

आचार्य हारीत- गर्भ से स्फुरण होता है ।

आचार्य भावमिश्र- बुद्धि की प्रतिबुद्धता।

सप्तम मास

सप्तमे मासि गर्भः सर्वैर्भावैराप्याय्यते । (च.सं.शा. 4/23)

सप्तमे सर्वाङ्गप्रत्यङ्गविभागः प्रवक्ततरः। (सु.सं.शा. 3/28)

सप्तमे सर्वाङ्गसम्पूर्णता ॥ (अ.सं.शा. 2/25)

सर्वैः सर्वाङ्गसंपूर्णो भावैः पुष्यति सप्तमे ॥ (अ.ह.शा. 1/58)

सर्वधात्वङ्गसम्पूर्णो वातपित्तकफान्वितः। सप्तमे मासि...॥ (का.सं.शा. 2/8)

आचार्य चरक- गर्भ सभी प्रकार के भावों से पुष्ट होता है ।

आचार्य सुश्रुत- अंग-प्रत्यंग का विभाग प्रव्यक्ततर होता है ।

आचार्य वृद्ध वाग्भट- सभी अंग सम्पूर्ण हो जाते हैं ।

आचार्य वाग्भट- सर्वांग सम्पूर्णता एवं सभी भावों की पुष्टि होती है ।

आचार्य काश्यप- गर्भ सभी धातुओं एवं अंगों से सम्पूर्ण तथा वात, पित्त एवं कफ से युक्त हो जाता है ।

आचार्य भावमिश्र- सभी अंगों एवं उपांगों की व्यक्तता का वर्णन किया है ।

अष्टम मास

अष्टमे मासि गर्भश्च मातृतो गर्भतश्च माता रसहारिणीभिः संवाहिनीभिर्मुहुर्मुहुरोजः परस्परत आच्छाद्य गर्भस्यासंपूर्णत्वात् । तस्मात्तदा गर्भिणी मुहुर्मुहुर्मुदा युक्ता भवति मुहुर्मुहुश्च म्लाना, तथा गर्भः; तस्मात्तदा गर्भस्य जन्म व्यापत्तिमद्भवत्योजसोऽनवस्थितत्वात् । तं चैवार्थमभिसमीक्ष्याष्टमं मासमगणयमित्यवदन् कुशलाः ॥ (च.सं.शा. 4/24)

अष्टमेऽस्थिरीभवत्योजः, तत्र जातश्चेन्न जीवेन्निरोजस्त्वानैर्ऋतभागत्वाच्च। (सु.सं.शा. 3/28)

अष्टमे गर्भश्च मातृतो गर्भतश्च माता रसहारिणीभिर्वाहिनीभिर्मुहुर्मुहुरोजः परम्परमाददाते । तस्मात्तदा गर्भिणी मुहुर्मुदिता भवति मुहुर्ग्लाना तथा गर्भः । एवं गर्भस्य जन्म व्यापत्तिमत्तदा भवति ॥
 ओजसोऽनवस्थितत्वात् । तथा ह्यस्य निष्क्रमणोन्मुखस्य परिवर्तनादीन्यनु-भवत एवैजसा वियोगः ।
 यद्यपि च किञ्चित्कालमस्योच्छ्वसनं स्यात्तच्छिन्नस्येवाङ्गस्यौजःसंस्कारानुवृत्तिकृतम् । जनन्यास्तु स्थिरौजस्कतयैकदेशेन रसे संक्रान्ते ग्लानिरेवेति ॥
 अन्ये पुनराहुः नैर्ऋतभागत्वात्तत्र गर्भस्य मरणम् ॥ (अ.स.शा. 2/26-28)

ओजोऽष्टमे सञ्चरति मातापुत्रौ महुः क्रमात् ॥
 तेन तौ म्लानमुदितौ तत्र जातो न जीवति ।
 शिशुरोजोऽनवस्थानात्ररी संशयिता भवेत् ॥

(अ.ह.शा. 1/62,63)

अष्टमे गर्भिणीगर्भावाददाते परस्परम् ।
 ओजो रसवहायुक्तेः पूर्णत्वाच्छलयत्यपि ॥
 तस्मात्तत्र मुहुर्ग्लाना मुहुर्हृष्ट च गर्भिणी ।
 अत्ययं चाप्युते तस्मान्न मासो गण्यतेऽष्टमः ॥

(का.सं.शा. 2/8)

आचार्य चरक—अष्टम मास में गर्भ की असम्पूर्णता के कारण रसहारीवाहिनियों अर्थात् रसवाही धमनियों के द्वारा ओज बार-बार माता से गर्भ एवं गर्भ से माता को आदान प्रदान होता रहता है, अतः गर्भिणी बार-बार प्रसन्न एवं बार-बार म्लान हो जाती है इसी भाँति गर्भ भी । अतः इस मास में यदि गर्भ का जन्म हो जाय तो ओज की अस्थिरता के कारण जीवन संशय होता है । अतः कुशल चिकित्सक अष्टम मास को प्रसव के लिए अगण्य (प्रसव के अयोग्य) समझते हैं ।

आचार्य सुश्रुत—अष्टम मास में ओज अस्थिर होता है अतः इस समय उत्पन्न बालक ओज के अनुपस्थित होने एवं नैर्ऋत भाग होने के कारण जीवित नहीं रहता है । टीकाकार डल्हण के मत से यह नैर्ऋत भाग राक्षस का अंश होता है जो रुद्र के द्वारा बालक में दिया जाता है, ऐसा कुमारतन्त्र में वर्णित है ।

आचार्य वृद्ध वाग्भट—अष्टम मास में ओज रस वाहिनियों के द्वारा बार-बार माता से गर्भ में एवं गर्भ से माता में आता जाता है । इससे गर्भिणी कभी प्रसन्न तो कभी म्लान होती है । इसी प्रकार गर्भ भी कभी प्रसन्न और कभी म्लान होता है । ओज अस्थिर होने से गर्भ का जन्म आपत्तियुक्त होता है । प्रसव के लिए उद्यत गर्भ के परिवर्तनों (प्रसव के समय होने वाली परिवर्तनों) के कारण ओज का वियोग हो जाता है । यद्यपि जन्म के उपरान्त बालक को किञ्चित् काल का श्वासोच्छ्वास होता है परन्तु वह कटे अंग की भाँति ओज के संस्कार के कारण होता है, (जिस प्रकार किसी अंग को शरीर से पृथक् कर देने पर भी कुछ समय तक उसमें गति होती रहती है उसी प्रकार ओज के संस्कार मात्र होने से गर्भ भी कुछ काल तक श्वासोच्छ्वास करता है) । माता में ओज के स्थिर होने तथा उसके एक भाग का ही स्खलन होने के कारण उसे केवल ग्लानि ही होती है, मृत्यु नहीं होती । अन्य विद्वानों का मत है कि गर्भ की मृत्यु नैर्ऋत भाग के कारण होती है ।

आचार्य वाग्भट- ओज क्रमशः माता एवं पुत्र में संचरित होता है, अतः वे उदाल या प्रसन्न या मुदित होने के इस मास में प्रसवित बालक ओज की अनुपस्थिति के कारण जीवित नहीं रहता एवं माता के जीवन को संशय होता है।

आचार्य काश्यप- माता एवं गर्भ रसवहा धमनियों के द्वारा परस्पर ओज का आदान प्रदान करते हैं। इसलिए माता कभी म्लान एवं कभी प्रसन्न होती है एवं अन्य अपद्रव होते हैं, अतः अष्टम मास को गर्भ के अपूर्ण रहने से प्रसव के लिए अगण्य अर्थात् अनुपयुक्त माना है।

आचार्य हारीत- गर्भ में अग्नि या पाचकाग्नि का संयोग माना है।

आचार्य भावमिश्र- ओज की अस्थिरता एवं उसका गर्भ या माता में प्रभाव माना है।

अष्टम मास में प्रसव-प्रतिषेधार्थ कर्त्तव्य

ततो बलिं मांसौदनमस्मै दापयेत् । (सु.सं.शा. 3/28)

तस्मात् प्रसवप्रतिषेधार्थ स्त्री स्नाता शुचिर्ब्रह्मचारिणी दैवताराधनपरमा स्यात् । मांसौदनबलिं चा निर्वपेत् ॥ (अ.सं.शा. 2/29)

महिर्ष सुश्रुत ने इस मास में मांस एवं ओदन की बलि देने का विधान किया है।

वृद्ध वाग्भट के अनुसार अष्टम मास में प्रसव के प्रतिषेध हेतु स्त्री स्नान करके, पवित्र, ब्रह्मचारिणी एवं देवता आदि की अराधना में तत्पर रहे तथा मांस एवं ओदन की बलि का विधान किया है, क्योंकि मृत्यु नैऋत भाग या भूतादि के कारण होती है न कि ओज की अस्थिरता से।

आचार्य भावमिश्र ने भी बलि आदि का विधान एवं नैऋत भाग बालक को रुद्र के द्वारा प्रदत्त बताया है।

नवम मास

महिर्षि हारीत- चेष्टोत्पत्ति का वर्णन दिया है।

अन्य आचार्यों ने नवम मास में गर्भ की वृद्धि का वर्णन नहीं दिया है।

अपरा या जरायु की उत्पत्ति

गृहीतगर्भाणामार्त्तववहानां स्रोतसां वर्त्मान्यवरुद्धयन्ते गर्भेण, तस्माद् गृहीतगर्भाणामार्त्तवं न दृश्यते ततस्तदधः प्रतिहतमूर्ध्वमागतमपरं चोपचीयमानमपरेत्यभिधीयते । (सु.सं.शा. 4/24)

तस्याश्च रजोवाहिनां स्रोतसां वर्त्मान्युपरुद्धयते गर्भेण । तस्मात्ततः परमार्त्तवं न दृश्यते ततस्तदधःप्रतिहतमपरमपरं चोपचीयमानमपरेत्याहुः । जरायुरित्यन्ते ॥ (अ.सं.शा. 2/10)

गर्भाधान हो जाने पर गर्भ के द्वारा आर्त्तववह स्रोतस् के मुख अवरुद्ध हो जाते हैं, इसीलिए गर्भाधान के बाद आर्त्तव (मासिक रजःस्राव) नहीं दिखाई देता। तत्पश्चात् अधोमार्ग से प्रतिहत हुआ आर्त्तव ऊपर के भाग में जाकर एकत्रित होता जाता है एवं अपरा नाम से कहा जाता है। टीकाकार डल्हण ने अन्यत्र भोज-वाक्य उद्धृत करते हुए रक्त से जरायु के तथा रस से गर्भ की नाभिनाड़ी की उत्पत्ति मानी है क्योंकि गर्भ रस एवं रक्तवाहिनियों दोनों का ही अवरोध कर देता है।

आचार्य वाग्भट ने अपरा को जरायु नाम दिया है एवं इसकी उत्पत्ति आचार्य सुश्रुतानुसार ही माना है।

टीकाकार इन्दु ने आहार-परिणाम का भी प्रभाव अपरा-निर्माण में माना है ।
आचार्य भावमिश्र ने महर्षि सुश्रुत के अनुसार ही वर्णन किया है ।

जरायु

गर्भवेष्टन चर्म । (अमरकोष)

येन वेष्टितो गर्भः कुक्षौ तिष्ठति सः । (अमरकोष)

गर्भाशय के भीतर गर्भ जिस विशिष्ट चर्म से वेष्टित या आच्छादित रहता है उस चर्म विशेष को जरायु कहते हैं ।
जरायु गर्भ के मुख को भी आच्छादित करता है जिसके कारण गर्भ रोता नहीं है । संहिताओं में जरायु का नाम अपरा एवं उल्बा के लिए भी प्रयुक्त हुआ है ।

उल्बा

आचार्य सुश्रुत एवं वाग्भट ने नवजात शिशु परिचर्या में उल्बा परिमार्जन हेतु सैंधव एवं सर्पि का प्रयोग बताया है ।
उल्लीयते इति । गर्भवेष्टित चर्मणः । यथोल्बेनावृतो गर्भस्तथा तेनेदमावृतम् । (शब्दकल्पद्रुम)

उल्बा गर्भ को वेष्टित या आवृत करने वाला चर्म विशेष है । इस प्रकार जरायु एवं उल्बा दोनों ही गर्भ को आच्छादित करते हैं । गर्भ प्रथम उल्बा तत्पश्चात् जरायु से आच्छादित रहता है ।

गर्भनाभि नाडी

गर्भ के नाभि से अपरा को जोड़ने वाली नाडी को गर्भ की नाभिनाडी कहते हैं । इसे ही नाभिनाल कहा गया है ।
नाभिनाल कर्तन का वर्णन भी नवजात शिशु परिचर्या के अन्तर्गत वर्णित है ।

गर्भ का पोषण

मात्रादीनां खलु गर्भकराणां भावानां संपदस्तथा वृत्तस्य सौष्ठवान्मातृतश्चैवोपस्नेहोपस्वेदाभ्यां
कालपरिणामात् स्वभावसंसिद्धेश्च कुक्षौ वृद्धिं प्राप्नोति ॥ (च.सं.शा. 4/27)

व्यपगतपिपासादुभुक्षस्तु खलु गर्भः परतन्त्रवृत्तिर्मातरमाश्रित्य वर्तयत्युपस्नेहोपस्वेदाभ्यां गर्भाशये
सद्सद्भूताङ्गावयवः, तदनन्तरं ह्यस्य कश्चिल्लोमकूपायनैरुपस्नेहः कश्चिन्नाभिनाड्ययनैः । नाभ्यां ह्यस्य
नाडी प्रसक्ता, नाड्यां चापरा, अपरा चास्य मातुः प्रसक्ता हृदये, मातृहृदयं ह्यस्य तामपरामभिसंज्वते
सिराभिः स्पन्दमानार्भिः, स तस्य रसो बलवर्णकरः संपद्यते, स च सर्वरसवानाहारः । स्त्रिया ह्यापन्नगर्भायान्निर्धः
रसः प्रतिपद्यतेस्वशरीरपुष्टये, स्तन्याय, गर्भवृद्धये च । स तेनाहारेणोपष्टब्धः (परतन्त्रवृत्तिर्मातरमाश्रित्य)
वर्तयत्यन्तर्गतः ॥ (च.सं.शा. 6/23)

निःश्वासोच्छ्वाससङ्क्षोभस्वप्नान्

गर्भोऽधिगच्छति ।

मातुर्निश्वसितोच्छ्वाससङ्क्षोभस्वप्नसम्भवान्

(सु.सं.शा. 2/58)

मातुस्तु खलु रसवहायां नाड्यां गर्भनाभिनाडी प्रतिबद्धा, साऽस्य मातुराहाररसवीर्यमभिवर्धते ।

तेनोपस्नेहेनास्याभिवृद्धिर्भवति । असञ्जाताङ्ग प्रत्यङ्गविभागं तु गर्भं निषेकात् ('असञ्जाताङ्गप्रत्यङ्ग
प्रविभागमानिषेकात्' पाठभेदः) प्रभृति सर्वशरीरवयवानुसारिणीनां रसवहानां तिर्यग्गतानां धमतीनामुपस्नेहो
जीवयति ॥ (सु.सं.शा. 3/29)

आचार्य चरक के अनुसार गर्भ का पोषण निम्न कारणों से होता है-

- माता आदि (मातृज, पितृज, रसज, सात्म्यज, सत्वज, आत्मज) गर्भकर भावों के सामान्य होने से,
- माता के समुचित उपचार (आहार-विहार) से,
- माता से आए हुए रस के उपस्नेह एवं उपस्वेद के द्वारा,
- काल के परिणाम से,
- स्वाभाविक रूप से अपने कर्म के अनुसार,
- सत् (सूक्ष्म रूप में उपस्थित), असत् (स्थूल रूप में अनुपस्थित) अंगावयव की अवस्था में गर्भाशय के उपस्नेह के द्वारा,
- अंग प्रत्यंग व्यक्त होने पर कुछ पोषण लोमकूप-मार्ग द्वारा प्राप्त उपस्नेह से एवं कुछ नाभिनाड़ी-मार्ग से होता है ।
- गर्भ की नाभि से नाड़ी, नाड़ी से अपरा एवं अपरा माता के हृदय से जुड़ी रहती है । माता का हृदय इस अंग को स्यन्दमान सिराओं के द्वारा आप्लावित करता है । माता का आहार सर्वरसवान होता है एवं उस सर्वरसवान आहार से निर्मित एवं अपरा में स्यन्दित रस गर्भ के बल तथा वर्ण की पुष्टि करता है । इस प्रकार गर्भ उस अंग के आश्रय से परतंत्र वृत्ति होने के कारण माता के आश्रित हो गर्भाशय के अन्दर जीवित रहता है ।
- गर्भिणी स्त्री द्वारा सेवित सर्वरसयुक्त अन्नपान से तीन कार्यों के लिए रस का निर्माण होता है-
 1. स्वशरीर-पोषण के लिए
 2. स्तन्य की उत्पत्ति के लिए
 3. गर्भ के वृद्धि या पोषण के लिए

आचार्य सुश्रुत के मतानुसार माता के निश्वास, उच्छ्वास, संक्षोभ (क्रियाशील) एवं स्वप्न से गर्भ भी निश्वास, उच्छ्वास, संक्षोभ एवं स्वप्न को प्राप्त होता है ।

माता के रसवाहा नाड़ियों से गर्भ की नाभिनाड़ी प्रतिबद्ध (जुड़ी) रहती है । यह माता के आहार-रस के अंगों से अभिवहन करती है । उसके उपस्नेह के द्वारा इस गर्भ की वृद्धि होती है । आनिषेक काल से अर्थात् शुक्र के योनि-निषेचन काल से गर्भाधान के बाद असंजात अंग-प्रत्यंग-विभागयुक्त की स्थिति तक गर्भ सर्वशरीरावयव को अनुपस्नेह करने वाली तिर्यग्गत रसवाही धमनियों के उपस्नेह से जीवित रहता है । टीकाकार डल्हण ने भोजवाक्य को उद्धृत करके लिखा है कि माता के द्वारा प्रयुक्त चतुर्विध आहार से उत्पन्न रस के तीन भाग होते हैं-

1. स्वशरीर-पोषण के लिए
2. स्तन्योत्पत्ति के लिए

3. तीसरे भाग से केदारी-कुल्या न्याय द्वारा गर्भ के पोषण के लिए ।
 आष्टांगसंग्रहकार के अनुसार गर्भ की स्थिति के बाद वह गर्भ माता के सोने पर सोता है एवं जगने पर जागता है एवं वह माता पर आश्रित रहता है । निषेककाल से अंग-प्रत्यंग के व्यक्त होने तक गर्भ गर्भाशय के उपस्नेह एवं उपस्वेद से जीवित रहता है । अंग प्रत्यंग व्यक्त होने के बाद गर्भ की नाभि से नाड़ी, नाड़ी से अपरा तथा अपरा माता के हृदय से प्रतिबद्ध रहती है । माता के हृदय से आहार-रस धमनियों द्वारा स्यन्दित होकर अपरा में आता है, अपरा से क्रमशः नाभिनाड़ी द्वारा गर्भ की नाभि को, उसके बाद गर्भ के पक्वाशय में पहुँचकर उसकी कार्याग्नि से पच्यमान होकर प्रसाद-बहुल होने के कारण गर्भ की धातु आदि का पुष्टि करता है । साथ ही गर्भ का उपस्नेह द्वारा भी पोषण होता है । टीकाकार इन्दु ने आहारोत्पन्न स्निग्धता से उपस्नेह तथा उत्क्लेद से उपस्वेद शब्द का वर्णन दिया है ।
 अष्टांगहृदय में वर्णन है कि गर्भ की नाभि में तथा माता के हृदय में नाड़ी निबन्धित रहती है, तथा केदारीकुल्या न्याय द्वारा गर्भ का पोषण होता है ।

महर्षि कश्यप ने चरकानुसार ही गर्भिणी स्त्री के द्वारा सेवित आहार से गर्भ के पोषण का वर्णन किया है । गर्भिणी स्त्री जो भी अन्नपान सेवन करती है उसके तीन भाग हो जाते हैं, एक माता की पुष्टि के लिए, दूसरा गर्भपोषण के लिए तथा तीसरा स्तन की पुष्टि के लिए (चरक एवं भेल ने स्तन्य की पुष्टि माना है) ।

महर्षि भेल ने भी केदारीकुल्या न्याय से पोषण माना है, तथा चरक सदृश अन्नपान से बने रस के तीन भागों का वर्णन किया है ।

आचार्य भावमिश्र ने माता की रसवहा नाड़ी से गर्भ की नाड़ी सम्बद्ध होने से गर्भ की वृद्धि का वर्णन किया है तथा आचार्य सुश्रुत सदृश ही माता के निश्वास आदि का होना बताया है ।

इस प्रकार वाग्भट, टीकाकार डल्हण एवं भेल ने गर्भ पोषण हेतु केदारी कुल्या न्याय को बताया है ।

गर्भ में सर्वप्रथम उत्पन्न होने वाला अङ्ग

तमेवमुक्तवन्तमग्निवेशं भगवान् पुनर्वसुरात्रेय उवाच—पूर्वमुक्तमेतद्गर्भावक्रान्तौ यथाऽयमभिनिर्वर्तते कुक्षौ, यच्चास्य यदा संतिष्ठतेऽङ्गजातम् । विप्रतिवादास्त्यत्र बहुविधाः सूत्रकृतामृषीणां सन्ति सर्वेषां तानपि निबोधोच्यमानान्—शिरः पूर्वमभिनिर्वर्तते कुक्षाविति कुमारशिरा भरद्वाजः पश्यति, सर्वेन्द्रियाणां तदधिष्ठानमिति कृत्वा; हृदयमिति काङ्कायनो वाह्मीकभिषक्, चेतनाधिष्ठानत्वात्; नाभिरिति भद्रकाण्डः, आहारागम इति कृत्वा; पक्वाशयगुदमिति भ्रदशौनकः, मारुताधिष्ठानत्वात्; हस्तपादमिति वडिशः, तत्करणत्वात् पुरुषस्य; इन्द्रियाणीति जनको वैदेहः, तान्यस्य बुद्ध्यधिष्ठानानीति कृत्वा; परोक्षत्वादचिन्त्यानिते मारीचिः कश्यपः सर्वाङ्गाभिनिर्वृत्तिर्युगपदिति धन्वन्तरिः; तदुपपन्नं, सर्वाङ्गानां तुल्यकालाभिनिर्वृत्तत्वाद् हृदयप्रभृतीनाम् । सर्वाङ्गानां हास्य हृदयं मूलमधिष्ठानं च केषाञ्चिद्भावानाम्, नच तस्मात् पूर्वाभिनिर्वृत्तिरेषां तस्माद्बुद्ध्यप्रभृतीनां सर्वाङ्गानां तुल्यकालाभिनिर्वृत्तिः, सर्वे भावा ह्यन्योन्यप्रतिबद्धाः तस्माद्यथाभूतदर्शनं साधु ॥ (च.सं.शा. 6/21)

गर्भस्य खलु सम्भवतः पूर्वं शिरः सम्भवतीत्याह शौनकः, शिरोमूलत्वात् प्रधानेन्द्रियाणाम्। हृदयस्य कृतवीर्यो बुद्धेर्मनसश्च स्थानत्वात्। नाभिरिति पाराशर्यः, ततो हि वर्धते देहो देहिनः। पाणिपादस्य मार्कण्डेयः, तन्मूलत्वाच्चेष्टाया गर्भस्य। मध्यशरीरमिति सुभूतिगौतमः, तन्निबद्धत्वात् सर्वगात्रसम्भवत् ॥ तत्तु न सम्यक् सर्वाण्यङ्गप्रत्यङ्गानि युगपत् सम्भवन्तीत्याह धन्वन्तरिः, गर्भस्य सूक्ष्मत्वात्त्रोपलब्धत्वं वंशाङ्कुरवच्चूतफलवच्च। तद्यथा—.....गर्भस्य तारुण्ये सर्वेष्वङ्गप्रत्यङ्गेषु सत्स्वपि सूक्ष्मत्वाद्नुपलब्धितान्येव कालप्रकर्षात् प्रव्यक्तानि भवन्ति ॥ (सु.सं.शा. 3/30)

चरक संहिता में गर्भ में सर्वप्रथम उत्पन्न होने वाले अङ्गों हेतु विभिन्न आचार्यों ने अलग-अलग मत प्रस्तुत किए हैं जो इस प्रकार हैं—

आचार्य		सर्वप्रथम उत्पन्न अंग
कुमार शिरा भारद्वाज	-	शिर
कांकायन	-	हृदय
भद्रकाप्य	-	नाभि
भद्रशौनक	-	पक्वाशय एवं गुद
बडिश	-	हाथ-पैर
वैदेह (जनक)	-	इन्द्रियाँ
मारीच काश्यप	-	अविचार्य विषय
धन्वन्तरि	-	एक साथ सर्वाङ्ग

भगवान् अग्निवेश ने गर्भ में एक साथ सर्वाङ्ग की उत्पत्ति होना युक्तिसंगत बताया है क्योंकि शरीर के सभी अङ्ग एक के साथ एक सम्बन्धित होते हैं। अतः सभी अङ्ग-प्रत्यङ्गों की उत्पत्ति एक साथ ही होती है।

इसी प्रकार सुश्रुत संहिता में भी विभिन्न आचार्यों द्वारा भिन्न-भिन्न मतों का वर्णन किया गया है—

आचार्य		सर्वप्रथम उत्पन्न अंग
शौनक	-	शिर
कृतवीर्य	-	हृदय
पराशर	-	नाभि
मार्कण्डेय	-	पाणि-पाद
सुभूति गौतम	-	मध्यशरीर
धन्वन्तरि	-	एक साथ सर्वाङ्ग

आचार्य भावमिश्र ने महर्षि सुश्रुत-सदृश ही वर्णन दिया है।

महर्षि भेल ने अधिकांशतः महर्षि चरक का ही अनुगमन किया है इन्होंने काश्यप के अनुसार सर्वप्रथम हृदय पराशर के अनुसार हृदय की सर्वप्रथम उत्पत्ति माना है।

गर्भ के अङ्ग-प्रत्यङ्ग की उत्पत्ति के घटक

गर्भस्य यकृतप्लीहानौ शोणितजी । शोणितफेन प्रभवः फुफुसः । शोणितकिट्टप्रभवः उण्डुकः ॥

असृजः श्लेष्मणश्चापि यः प्रसादः परो मतः ।
 तं पच्यमानं पित्तेन वायुश्चाप्यनुधावति ॥
 ततोऽस्यान्त्राणि जायन्ते गुदं बस्तिश्च देहिनः ॥
 उदरे पच्यमानानामाध्मानाद्बुक्मसारवत् ।
 कफशोणितमांसानां सारो जिह्वा प्रजायते ॥
 यथार्थमूष्मणा युक्तो वायुः स्रोतांसि दारयेत् ।
 अनुप्रविश्य पिशितं पेशीर्विभजते तथा ॥
 मेदसः स्नेहमादाय सिरा स्नायुत्वमाप्नुयात् ।
 सिराणां तु मृदुः पाकः स्नायूनां च ततः खरः ॥
 आशय्याभ्यासयोगेनकरोत्याशयसम्भवम् ॥

रक्तमेदः प्रसादाद् वृक्कौ, मांसासृक्कफमेदः प्रसादाद् वृषणौ, शोणित-कफप्रसादजं हृदयं.....॥

(सु.सं.शा. 4/25-30)

प्राणस्तु बीजधातुं हि विभजत्यस्थिसंख्य(स्थ)या ।
 प्रविष्टमात्रं बीजं हि रक्तेन परिवेष्टयते ॥
 शुक्रादस्थ्यस्थितो मांसमुभाभ्यां स्नायवः स्मृताः ।
 सर्वेन्द्रियाणि गर्भस्य सर्वाङ्गावयवास्तथा ॥

(का.सं.शा. 2/2-3)

शोणिताद्धृदयं तस्य जायते हृदयाद्यकृत् ।
 यकृतो जायते प्लीहा प्लीहः फुफुसमुच्यते ।
 परस्परनिबन्धानि सर्वाण्येतानि भार्गव ! ॥

(का.सं.शा. 2/5-6)

महर्षि सुश्रुत ने गर्भ-शरीर के विभिन्न अंगों की उत्पत्ति का वर्णन निम्न प्रकार से किया है—

घटक

गर्भ में उत्पन्न अङ्ग-प्रत्यङ्ग

रक्त

- यकृत एवं प्लीहा

रक्तफेन

- फुफुस

रक्त मल

- उण्डुक

रक्त-श्लेष्मा के प्रसाद का पित्त द्वारा पाचन एवं वायु

- आन्त्र, गुदा, बस्ति

कफशोणित मांस प्रसाद

- जिह्वा

वायु एवं पित्त से स्रोतस के विदारण, मांस

- पेशी

मेद के स्नेह का मृदुपाक

- शिरा

मेद के स्नेह का खर पाक	-	स्नायु
वात, पित्त एवं मांस	-	आशय
रक्तमेद प्रसाद	-	वृक्क
मांस रक्त कफ मेद प्रसाद	-	दोनों वृषण
शोणित कफ प्रसाद	-	हृदय

वृद्ध वाग्भट ने भी इसी प्रकार का वर्णन किया है केवल रक्त मांस के प्रसाद से आन्त्र की उत्पत्ति तथा कफ, रक्त स्त्रोतसों एवं महाभूतों के प्रसाद से इन्द्रियों की उत्पत्ति बतायी है।

महर्षि काश्यप के अनुसार प्राण (जीवात्मा) बीज धातु को अस्थि-संख्या या अस्थि-संस्थान के अनुसार विभक्त करता है। शरीर में प्रविष्ट हुआ बीज रक्त के द्वारा परिवेष्टित हो जाता है। शुक्र से गर्भ की अस्थियाँ, अस्थि से मांस तथा अस्थि एवं मांस दोनों से स्नायु, गर्भ के सभी अंगावयव तथा इन्द्रियों का निर्माण होता है। शोणित से हृदय, हृत् से यकृत, यकृत से प्लीहा एवं प्लीहा से फुफ्फुस की उत्पत्ति होती है, एवं ये अंग आपस में एक दूसरे से निरन्तर रहते हैं।

महर्षि हारीत के अनुसार वात एवं रक्त से त्वचा उत्पन्न होती है। मांस त्वचा के आश्रय में रहता है। शुक्र एवं श्लेष्मा से मेद एवं रक्त से रस तथा अस्थि की उत्पत्ति होती है। हृदय में पित्त आश्रित या स्थित है, यकृत वात-रक्त-मय है। रक्त, श्लेष्मा तथा रस का आश्रय उरु या जंघा है, प्लीहा कफ, रक्त एवं श्लेष्म-मय तथा पेशियाँ कफ एवं रक्तमय है।

गर्भ के जन्मोपरान्त उत्पन्न होने वाले अङ्गावयव

येऽस्य जातस्योत्तरकालं जायन्ते; तद्यथा-दन्ता व्यञ्जनानि व्यक्तौभावस्तथायुक्तानि चापराणि। एषा प्रकृतिः, विकृतिः पुनरतोऽन्यथा। (च.सं.शा. 4/14)

जन्मोत्तरकालजेभ्यो दन्तादिभ्यः क्रमेण तु स्पष्टीभवन्ति। एषा प्रकृतिः। विकृतिरतोऽन्यथा।

(अ.सं.शा. 2/13)

जो भाव गर्भ के जन्म के बाद व्यक्त होते हैं वे इस प्रकार हैं— दाँत, व्यञ्जन (दाढ़ी, मूँछ, कक्षा-गुह्य प्रदेश में लोम-स्त्रियों में स्तन आदि), व्यक्तिभाव (समय से रज एवं शुक्र का प्रादुर्भाव), यह प्रकृति है एवं इसके विपरीत विकृति है।

अष्टाङ्गसंग्रहकार के अनुसार दन्तादि की उत्पत्ति जन्मोत्तर काल में क्रमशः होती है यह प्रकृति है। इससे विपरीत (जन्म में ही दाँत आदि का निकलना) विकृति होता है।

गर्भ में वर्णोत्पत्ति का कारण

न खलु केवलमेतदेव कर्म वर्णवैशेष्यकरं भवति। अपि तु तेजोधातुरप्युदकान्तरिक्षधातुप्रायोऽवदातवर्णकरं भवति, पृथिवीवायुधातुप्रायः कृष्णवर्णकरः, समसर्वधातुप्रायः श्यामवर्णकरः ॥ (च.सं.शा. 8/15)

तत्र तेजोधातुः सर्ववर्णानां प्रभवः, स यदा गर्भोत्पत्तावब्धातुप्रायो भवति तदा गर्भं गौरं करोति, पृथिवीधातुप्रायः कृष्णं, पृथिव्याकाशधातुप्रायः कृष्णश्यामं, तोयाकाशधातुप्रायो गौरश्यामम्। यादृग्वर्ण-माहारमुपसेवते गर्भिणी तादृग्वर्णप्रसवा भवतीत्येके भाषन्ते ॥ (सु.सं.शा. 2/37)

तत्र शुक्रे शुक्ले घृतमण्डाभे वा गर्भस्य गौरत्वं तैलाभे कृष्णात्वं मध्वाभे श्यामत्वं। तथा क्षीरादिमधुराणामुपयोगान्मातुरुदकविहाराच्च गौरता तिलान्नविदाहिना कृष्णाता व्यामिश्राणां श्यामता। देशकुलानुवृत्तितश्च वर्णभेदः तथा तेजोधातोरुदकाकाशधातुसम्पर्काद्गौरता भूवायुसम्पर्कात् कृष्णाता सर्वधातुसाम्ये श्यामता। (अ.सं.शा. 1/65)

महर्षि चरक के अनुसार—

- तेज, जल एवं आकाश धातु प्रधान होने पर गौर वर्ण कारक,
- तेज, पृथ्वी एवं वायु धातु प्रधान होने पर कृष्ण वर्ण कारक,
- सभी धातुओं का साम्य होने पर श्याम वर्ण कारक होता है।

महर्षि सुश्रुत के अनुसार—

- तेज धातु सर्व वर्णोत्पत्ति का हेतु है,
- तेज एवं जल धातु प्रधान होने पर गौर वर्ण,
- तेज, जल तथा आकाश धातु प्राधान्य में गौरश्याम वर्ण,
- तेज एवं पृथ्वी धातु प्राधान्य होने पर कृष्ण वर्ण,
- तेज, पृथ्वी एवं आकाश धातु प्राधान्य में कृष्ण-श्याम वर्ण की उत्पत्ति होती है।
- अन्य आचार्यों का कथन है कि गर्भिणी स्त्री जिस प्रकार के वर्ण के आहार का सेवन करती है उस प्रकार के गर्भ को उत्पन्न करती है।

आचार्य वृद्ध वाग्भट ने गर्भ की वर्णोत्पत्ति के लिए चार कारणों का वर्णन किया है—

1. शुक्र के श्वेत, घृत या मण्डाभ होने पर गर्भ में गौरवर्णता, तैलाभ होने पर कृष्णवर्णता एवं मध्वाभ होने पर श्यामवर्णता होती है।
2. माता (गर्भिणी) के द्वारा दुग्ध आदि मधुर द्रव्यों के उपयोग एवं जल विहार आदि करने से गर्भ में गौरवर्णता; तिल, अन्न आदि विदाही पदार्थों के सेवन से कृष्णवर्णता एवं मिश्रित आहार-विहार से श्यामवर्णता होती है।
3. देश, काल एवं अनुवृत्ति से भी वर्णभेद होता है।
4. तेज धातु के उदक एवं आकाश से सम्पर्क होने पर गौरवर्णता, पृथ्वी एवं वायु के सम्पर्क से कृष्णवर्णता एवं सभी धातुओं के साम्य से श्यामवर्णता होती है (चरकानुसार)।

महर्षि हारीत ने दोष प्रधान्य का वर्ण निर्माण में कारण बताते हुए निम्न प्रकार से वर्ण की उत्पत्ति मानी है—

वात दोष	-	श्याम वर्ण
पित्त दोष	-	गौर वर्ण
कफ दोष	-	श्याम वर्ण
वातरक्त दोष	-	कृष्ण वर्ण

पित रक्त दोष	-	पिंगल वर्ण
कफरक्त दोष	-	श्याम वर्ण

गर्भ की जात्यन्धता एवं नेत्र की वर्णोत्पत्ति का कारण

तत्र दृष्टिभागमप्रतिपन्नं तेजो जात्यन्धं करोति, तदेव रक्तानुगतं रक्ताक्षं, पित्तानुगतं पिङ्गलाक्षं, श्लेष्मानुगतं शुक्लाक्षं, वातानुगतं विकृताक्षमिति ॥ (सु.सं.शा. 2/38)

अपि च-दृष्टिभागमप्रतिपन्नं तेजो जात्यन्धत्वं तदेव वातानुगतं विकृतरुक्षारुणाक्षं पित्तानुगतं पिङ्गलाक्षं श्लेष्मानुगतं शुक्लाक्षं रक्तानुगतं रक्ताक्षमिति ॥ (अ.सं.शा. 2/57)

- दृष्टि-भाग में तेज धातु न पहुँचने पर जात्यन्ध सन्तान,
- तेज वातानुगत होने पर विकृताक्ष,
- तेज पित्तानुगत होने पर पिंगलाक्ष,
- तेज श्लेष्मानुगत होने पर शुक्लाक्ष,
- तेज रक्तानुगत होने पर रक्ताक्ष संतान की उत्पत्ति होती है ।

टीकाकार डल्हण ने जात्यन्धता की उत्पत्ति में पूर्वजन्म के कर्म की प्रधानता मानते हुए दृष्टिभाग में तेज के पहुँचने का काल गर्भ का चतुर्थ मास बताया है । अन्यत्र दौहद-अवमानन से भी विकृताक्ष या अनक्ष (अक्षि विरहित) शिशु की उत्पत्ति का वर्णन किया है ।

अष्टांगसंग्रहकार ने सुश्रुत सदृश ही वर्णन करते हुए तेज के वातानुगत होने पर विकृत, रुक्ष एवं अरुणाक्ष वर्णन किया है ।

गर्भ के लिङ्ग-निर्माण का हेतु

रक्तेन कन्यामधिकेन पुत्रं शुक्रेण.....॥ (च.सं.शा. 2/12)

तत्र शुक्रबाहुल्यात् पुमान्, आर्तवबाहुल्यात् स्त्री, साम्यादुभयोर्नपुंसकमिति ॥ (सु.सं.शा. 3/4)

तत एव च शुक्रस्य बाहुल्यात्पुमान्, आर्तवस्य बाहुल्यात्स्त्री, तयोः साम्येन नपुंसकम् ॥

(अ.सं.शा. 2/5)

अत एव च शुक्रस्य बाहुल्याज्जायते पुमान् ।

रक्तस्य स्त्री, तयोः साम्ये क्लीब.....॥ (अ.ह.शा. 1/5)

सभी आचार्यों ने रक्त या आर्तव की अधिकता से कन्या या स्त्री एवं शुक्र की अधिकता से पुत्र या पुमान् की उत्पत्ति का वर्णन किया है तथा शुक्र एवं आर्तव के समान होने से नपुंसक की उत्पत्ति बताया है ।

टीकाकार अरुणदत्त ने लिखा है कि संभोग के समय यदि पुरुष पहले विसर्जित हो तो वीर्यवान पुत्र, यदि स्त्री पहले विसर्जित हो तो रूपवती कन्या उत्पन्न होती है । इसी कारण से ही कुछ पुंगर्भ मातृ सदृश तथा स्त्रीगर्भ पितृ सदृश होते हैं अर्थात् यदि शुक्राधिक्य का पुंगर्भ है पर स्त्री पूर्व विसर्जित हुई तो मातृ सदृश पुंगर्भ एवं यदि रजोधिक्य होने पर

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भी पुरुष पहिले विसर्जित हो तो पितृसदृश कन्या गर्भ होगा ।

टीकाकार डल्हण ने आर्तव एवं शुक्र के बाहुल्य का स्पष्टीकरण देते हुए वर्णन किया है कि आर्तव चतुरञ्जलि प्रमाण एवं शुक्र एक प्रसृति मात्र होता है अतः आर्तव का तो बाहुल्य हर समय रहेगा, पर ऐसी बात नहीं है, यहाँ पर गर्भाशय स्थित मल-रहित गर्भजनक आर्तव की मात्रा का ग्रहण करना चाहिए; अथवा स्वमान (अपने-अपने सामान्य मान) के आधार पर बाहुल्य का ग्रहण करना चाहिए । शुक्र कदाचित् अत्यन्त हर्ष के कारण मात्रा में अधिक स्रवित हो जाता है एवं कदाचित् मानसिक ग्लानि से अल्पमात्रा में स्रवित होता है । अन्य आचार्यों के मत को उद्धृत करते हुए शुक्र एवं आर्तव के प्रमाण को न लेकर उसमें स्थित वीर्य या कार्यशक्ति की अधिकता को कारण स्वरूप बताया है ।

महर्षि भेल ने अन्य स्थान पर संभोग के समय पुरुष के सर्वार्थ नन्दित होने तथा स्त्री के जघन्य होने से पुरुष के अंग-प्रत्यंग सदृश तथा स्त्री के प्रथम अर्थ-साधन एवं पुरुष के जघन्य होने से स्त्री के अंग-प्रत्यंग सदृश सन्तान की उत्पत्ति मानी है ।

योगरत्नाकरकार ने दक्षिण नाड़ी से पुत्र एवं वामनाड़ी से कन्या की उत्पत्ति का वर्णन भी किया है ।

महर्षि हारीत के अनुसार मनुष्य के शुक्र के अधिक होने से हीन रस और इन्द्रियों के द्वारा भी पुत्र की उत्पत्ति होती है । स्त्री के रेतस की अधिकता से और शुक्र और इन्द्रियों के हीन होने पर भी रज की अधिकता से कन्या की उत्पत्ति होती है । मैथुन के समय वीर्य और रज दोनों के समान होने से न पुरुष की प्रकृति है और न स्त्री की प्रकृति होती है ऐसे सन्तान को नपुंसक कहते हैं । सम दोष धातु प्रकृति विकृति रज और वीर्य समान होने से अगर स्त्री का जन्म होता है तो सन्तान श्याम और नपुंसक उत्पन्न होती है ।

आचार्य शार्ङ्गधर ने परमेश्वर की इच्छा की प्रधानता भी गर्भ के लिङ्गोत्पत्ति का कारण बताया है ।

गर्भ का स्वरूप

.....अग्निषोमीयत्वाद् गर्भस्य । (सु.सं.सू. 14/7)

आर्तव या रज अग्नि गुण प्रधान (आग्नेय) एवं शुक्र सोम गुण प्रधान (सौम्य) होता है इस प्रकार गर्भ अग्नि और सोम गुण प्रधान होता है ।

गर्भ के कार्य

गर्भो गर्भलक्षणम् ॥ (सु.सं.सू. 15/9)

गर्भ गर्भ के लक्षणों (स्तनों की श्यावमुखतादि) का उत्पादक होता है ।

गर्भाङ्ग विकृति

सामान्य कारण

बीजात्मकर्माशयकालदोषैर्मातुस्तथाऽऽहारविहारदोषैः ।

कुर्वन्ति दोषा विविधानि दुष्टाः संस्थानवर्णेन्द्रियवैकृतानि ॥

(च.सं.शा. 2/1)

यच्चोक्तं—यदि च मनुष्यो मनुष्यप्रभवः, कस्मान्न जडादिभ्यो जाताः पितृसदृशरूपा भवन्तीति; तत्रोच्यते—
यस्य यस्य ह्यङ्गावयवस्य बीजे बीजभाग उपतप्तो भवति, तस्य तस्याङ्गावयवस्य विकृतिरुपजायते,
नोपजायते चानुपतापात्; तस्मादुभ्योपपत्तिरप्यत्र । सर्वस्य चात्मजानीन्द्रियाणि, तेषां भावाभावहेतुर्देवः,
तस्मान्नैकान्ततो जडादिभ्यो जाताः पितृसदृशरूपा भवन्ति ॥ (च.सं.शा. 3/17)

- बीज (शुक्र, शोणित) के दोष,
- आत्मकर्म दोष (पूर्वजन्म के अशुभ कर्म),
- आशय (गर्भाशय) दोष,
- काल-दोष एवं
- माता के आहार-विहार-दोष आदि ।

पुनः महर्षि चरक ने बताया है कि बीज-स्थित जो जो बीजभाग दूषित होता है उस-उस अंगावयव की विकृति होती है, बिना दोष के कोई विकृति नहीं होती, इस प्रकार दोनों ही बातें युक्तिसंगत है । सभी इन्द्रियाँ आत्मज हैं, इनका होना या न होना देव के आधीन है, अतः जड़ या अन्धे आदि पिता से उत्पन्न बालक निश्चित रूप से पितृ-सदृश नहीं होता है ।

जब वातादि दोषों के प्रकोपक आहारों का सेवन करने से स्त्री के शरीर के वातादि दोष प्रकुपित होकर शरीर में फैलते हुए स्त्री-बीज एवं गर्भाशय को प्राप्त करते हैं, परन्तु सम्पूर्ण शोणित एवं गर्भाशय को दूषित नहीं करते तब स्त्री जो गर्भ धारण करती है, उस गर्भ के मातृज अवयवों या अन्य अवयवों में से एक या अनेक अवयवों में विकृति उत्पन्न हो जाती है, बीज-स्थित जिस जिस अवयव के बीज-भाग में प्रकुपित दोष पहुँचाते हैं, या प्रकुपित दोष जिस जिस अंगावयव के बीजांश को दूषित करते हैं, उस उस अवयव में विकृति उत्पन्न होती है ।

महर्षि चरक के अनुसार गर्भोत्पत्ति के समय स्त्री का मन जिस जन्तु या प्राणी की ओर जाता है स्त्री उसी प्रकार के पुत्र को जन्म देती है ।

महर्षि सुश्रुत के अनुसार—

सर्पवृश्चिककृष्माण्डविकृताकृतयश्च ये ।
गर्भास्त्वेते स्त्रियाश्चैव ज्ञेयाः पापकृतो भृशम् ॥
गर्भो वातप्रकोपेण दौहदे वाऽवमानिते ।
भवेत् कुब्जः कुणिः पङ्कर्मको मिन्मिन एव वा ॥
मातापित्रोस्तु नास्तिक्यादशुभैश्च पुराकृतैः ।
वातादीनां प्रकोपेण गर्भो वैकृतमाप्नुयात् ॥

- पाप कर्म के कारण।

(सु.सं.शा. 2/53-55)

- वात के प्रकोप से अथवा दौहद के अवमानन से।
- माता-पिता की नास्तिकता से।
- पूर्वजन्म के अशुभ कर्मों से।
- वायु आदि दोषों के प्रकोप से गर्भ विकृति को प्राप्त होता है।
- दौहदकाल में जिन जिन इन्द्रियों के अर्ध (इच्छा) की अवमानना होगी, गर्भस्थ शिशु की उन-उन इन्द्रियों में विकृति उत्पन्न होगी।
- अंग-प्रत्यंग की उत्पत्ति में जो गुण (सामान्यताएँ) एवं अवगुण (विकार) होते हैं वे धर्म एवं अधर्म के कारण स्वरूप होते हैं अर्थात् सामान्यताएँ धर्म के एवं विकृतियाँ अधर्म के कारण होती हैं।
- प्रसव के समय अकाल-प्रवाहण।

अष्टाङ्गसंग्रहकार ने वर्णन किया है कि वायु का विकृत होना गर्भाङ्ग विकृति का प्रधान कारण है। षोडश वर्ष से कम आयु की स्त्री में, या ऋतुकाल के प्रारम्भ के तीन दिनों में गर्भाधान होने पर या शुक्रार्तव की विकृति से विकृत गर्भ की उत्पत्ति होती है। साथ ही महर्षि चरक सदृश बीजांश की दृष्टि एवं सुश्रुत सदृश ही अकाल-प्रवाहण से कुब्जता होने का उल्लेख किया है।

अष्टाङ्गहृदयकार ने संक्षेप में ही लिखा है कि विकृत योनि या आकार के गर्भ वातादि दोषों के विकार के कारण उत्पन्न होते हैं। टीकाकार अरुणदत्त ने गर्भाङ्ग-विकृति का कारण दुष्ट दोषों का उन्मार्ग-गमन माना है।

आचार्य भेल ने माता-पिता के बीज दोष, पथ्यरस का सेवन न करना, वेग-धारण एवं योनि-दोष आदि कारण बताये हैं; अतः सम्यक् रस वाले आहार का ऋतुकाल में सेवन का विधान किया है। विशेषकर ऋतुकाल में सम्यग् रस के न सेवन से विकृत गर्भ की उत्पत्ति बताया है। उदावर्त रोग से पीड़ित, अहित सेवी दम्पति से बलहीन एवं अन्धे आदि सन्तान की उत्पत्ति; तथा हाथी एवं कुत्ते आदि के स्वरूप की सन्तानोत्पत्ति का कारण वायु तथा आकाश की विकृति एवं दैव-प्रकोप माना है।

आचार्य भावमिश्र ने वातादि दोष से दूषित शुक्र के प्रजोत्पादन असमर्थता में स्पष्टीकरण दिया है कि विकृत शुक्र जन्मान्ध आदि की उत्पत्ति का कारण होता है। पुनः महर्षि सुश्रुत के अनुसार ही वर्णन किया है।

योगरत्नाकर ने पापकर्म को ही गर्भ विकृति का कारण माना है।

विकृतगर्भ लक्षण

- सर्प, वृश्चिक, कूष्माण्ड आदि विकृत आकृति वाले गर्भ।
- कुब्ज, कुणि, पंगु, मूक या मिन्मिन, जात्यान्ध, बधिर, विकट संतान।
- हाथी एवं कुत्ते आदि के स्वरूप की संतान।
- अन्य विकृत आकार वाले संतान।

माता के दोष-प्रकोपक आहार से उत्पन्न गर्भाङ्ग विकृति

वातल आहार सेवन

यदा च लब्धगर्भाऽन्वक्षमेव वातलान्यासेवते तदाऽस्या वायुः प्रकुपितः शरीरमनुसर्पन् गर्भाशयेऽवतिष्ठमानो गर्भस्य जडबधिरमूकमिम्भिणगद्गदखंजकुब्जवामनहीनाङ्गाधिकाङ्गत्वान्यन्यं वा वातविकारं करोति ॥
(अ.सं.शा. 2/54)

वातलैश्च भवेद् गर्भः कुब्जान्धजडवामनः ॥ (अ.ह.शा. 1/48)

गर्भ जड़, बधिर, मूक, मिम्बिन या गद्गद आवाज वाला, खंज (लंगड़ा), कुब्ज, वामन (छोटे शरीर वाला), हीन या अधिक अंग वाला या अन्य वात-विकारों से युक्त होता है ।

वाग्भट-द्वय ने अन्यत्र बताया है कि गर्भावस्था में वायु की विकृति के कारण कान की शष्कुलि (बाह्यकर्ण) सङ्कुचित हो जाती है, इसे कूचिकर्णक कहते हैं ।

पित्तल आहार सेवन

तथा वायुवत्पित्तमपि खलितपलितश्मश्रुहीनतात्वङ्नखकेशपैङ्गल्यादीनि ॥

(अ.सं.शा. 2/55)

पित्तलैः खलतिः पिङ्गः,..... ॥ (अ.ह.शा. 1/48)

खलित, पलित, श्मश्रुहीनता, त्वचा, नख एवं केशों में पिंगल वर्णता आदि अन्य पित्तज विकार उत्पन्न होते हैं ।

श्लेष्मल आहार सेवन

श्लेष्मा तु कुष्ठकिलाससदन्तत्वादीनि ॥ (अ.सं.शा. 2/56)

.....श्चित्री पाण्डुः कफात्मभिः ॥ (अ.ह.शा. 1/48)

कुष्ठ, किलास एवं सदन्त-जन्म आदि अन्य श्लेष्मा के विकार उत्पन्न होते हैं ।

अष्टाङ्गहृदयकार ने श्वित्र एवं पाण्डु को कफज विकार माना है ।

त्रिदोषज आहार सेवन

त्रिदोषज आहारादि के सेवन से मिश्र विकार उत्पन्न होते हैं ।

वाग्भट-द्वय ने गर्भ में एक अथवा अनेक पिप्पली के समान वेदना रहित मासाङ्कुर (पिप्पली) हो जाते हैं, का वर्णन किया है ।

अस्थि-विरहित गर्भ

जब दो अत्यन्त कामातुर स्त्रियाँ समागम करती हैं एवं किसी प्रकार एक दूसरे में शुक्र का उत्सर्ग करती हैं तो अस्थि विरहित या अल्प कोमलास्थि युक्त गर्भ की उत्पत्ति होती है ।

यदि ऋतुस्नाता स्त्री स्वप्न में मैथुन करती है या अनुभव करती है, तो प्रकुपित वायु आर्तव को गर्भाशय में ले जाकर गर्भ की उत्पत्ति कर देती है। उस गर्भिणी में गर्भ के लक्षण प्रतिमास बढ़ते जाते हैं तथा पितृगुण (केश, रमश्रु, लोम, नख, दन्त, शिरा, स्नायु, धमनी, रेत प्रभृति) से विरहित कलल की उत्पत्ति होती है।
भावप्रकाश एवं योगरत्नाकर में भी यही वर्णन आया है।

गर्भिणी की व्याधियों का गर्भ पर प्रभाव

दोषाभिघातैर्गर्भिण्या यो यो भागः प्रपीड्यते ।

स स भागः शिशोस्तस्य गर्भस्थस्य प्रपीड्यते ॥

(सु.सं.शा. 3/14 एवं भा.प्र.पूर्व. 3/334)

दोषों की विकृति से अथवा अभिघातादि से गर्भिणी स्त्री का जो-जो भाग या अंग पीड़ित होता है, गर्भस्थ शिशु का भी वही-वही अंग पीड़ित होता है।

गर्भस्थ शिशु के अरुदन का कारण

जरायुणा मुखेच्छन्ने कण्ठे च कफवेष्टिते ।

वयोमार्गनिरोधाच्च न गर्भस्थः प्ररोदिति ॥

(सु.सं.शा. 2/57; अ.सं.शा. 2/65 एवं भा.प्र.पूर्व. 3/329)

- जरायु से मुख के आच्छादित होने।
 - कण्ठ के कफ से आवेष्टित या अवरुद्ध होने।
 - वायु के मार्ग का निरोध होने से गर्भस्थ शिशु रोता नहीं है।
- टीकाकार डल्हण ने लिखा है कि घोष-जनक वायु के मार्ग का अवरोध होता है, क्योंकि निःश्वासादि रूप वायु का वर्णन किया जा चुका है इसका मार्ग अवरुद्ध हो जाने पर गर्भ जीवित ही नहीं रहेगा।

गर्भ में मल के अभाव का कारण

गर्भस्थ शिशु के वात (अपान वायु), मूत्र एवं पुरीष का त्याग नहीं करने के निम्न कारण बताये गए हैं—

मलाल्पत्वादयोगाच्च वायोः पक्वाशयस्य च ।

वातमूत्रपुरीषाणि न गर्भस्थः करोति हि ॥ (सु.सं.शा. 2/56;

अजातस्य साक्षादन्नपानाननुप्रवेशादमलत्वाच्च रसस्य गर्भस्थस्य स्थूलमला-सम्भवः । (अ.सं.शा. 2/34)

- मल के अत्यल्प होने।
- पक्वाशय में वायु के अयोग या ईषत् योग होने।
- अनुत्पन्न या गर्भस्थ शिशु में अन्नपान आदि के साक्षात् रूप में प्रविष्ट न होने।
- आहार-रस के मल-रहित या प्रसाद रूप होने के कारण गर्भ में स्थूल मल का अभाव होता है।
- महर्षि भेल ने उदरस्थ शिशु के आहार न लेने के कारण पुरीष की अनुपस्थिति का वर्णन किया है।

गर्भ के शुभ एवं अशुभ भाव

निमित्तमात्मा प्रकृतिवृद्धिः कुक्षौ क्रमेण च ।
 वृद्धिहेतुश्च गर्भस्य पञ्चार्थाः शुभसंज्ञिताः ॥
 अजन्मनि च यो हेतुर्विनाशे विकृतावपि ।
 इमांस्त्रीनशुभान् भावानाहुर्गर्भविघातकान् ॥
 शुभाशुभसमाख्यातानष्टौ भावानिमान् भिषक् ।
 सर्वथा वेद यः सर्वान् स राज्ञः कर्तुमर्हति ॥

(च.सं.शा. 4/42-44)

गर्भ के 5 शुभ (अर्थात् पुत्र प्राप्ति के लिये अनुष्ठेय) भाव कहे गये हैं—

1. गर्भ का कारण
2. गर्भ की आत्मा,
3. गर्भ की प्रकृति,
4. गर्भ की कुक्षि में क्रमिक वृद्धि एवं
5. गर्भ की वृद्धि के हेतु

गर्भ के 3 अशुभ या गर्भ के घातक भाव कहे गये हैं—

1. गर्भ के उत्पन्न न होने के कारण,
2. गर्भ विनाश के कारण एवं
3. गर्भ-विकृति के कारण ।

इन आठ शुभ एवं अशुभ कहे जाने वाले भावों को जो वैद्य भलीभाँति जानता है वह राजा की चिकित्सा करने में क्षमता रखता है ।

गर्भाशयान्तर गर्भ की स्थिति

गर्भस्तु खलु मातुः पृष्ठाभिमुख ऊर्ध्वशिराः सङ्घुच्याङ्गान्यास्तेऽन्तःकुक्षौ ॥ (च.सं.शा. 6/22)

आभुगोऽभिमुखः शेते गर्भो गर्भाशये स्त्रियाः । (सु.सं.शा. 5/57)

गर्भस्तु मातुः पृष्ठाभिमुखो ललाटे कृताञ्जलिः सङ्घुचिताङ्गो गर्भकोष्ठे दक्षिणपार्श्वमाश्रित्यावतिष्ठते पुमान्
 वामं स्त्री मध्यं नपुंसकम् ॥ (अ.सं.शा. 2/31)

महर्षि चरक—

- माता के पीठ की ओर मुख,
- ऊपर की ओर शिर तथा

• सभी अङ्गों को संकुचित करके गर्भ गर्भाशय में स्थित रहता है ।

महर्षि सुश्रुत—

- आभुग्न (अच्छी प्रकार झुका या संकुचित) एवं
- अभिमुख (माता के मुख के सामने मुख करके या पृष्ठाभिमुख) होकर शयन करता है ।

अष्टाङ्गसंप्रहकार—

- माता की पीठ की ओर मुख करके,
- ललाट (मस्तक) के पास अंजलि बनाकर (दोनों हाथों को जोड़कर),
- अङ्गों को संकुचित करके गर्भाशय में रहता है ।
- यदि पुरुष (गर्भ) है तो दक्षिण पार्श्व को आश्रय लेकर,
- यदि स्त्री (गर्भ) है तो वाम पार्श्व तथा
- नपुंसक है तो मध्य में स्थित रहता है ।

महर्षि भेल ने तीन आचार्यों का मत प्रकट किया है—

- शौनक के मतानुसार ऊर्ध्व शिर ।
- भरद्वाज के मतानुसार अवाक्शिर (नीचे को शिर करके) रहता है ।
- भगवान् पुनर्वसु आत्रेय के अनुसार यदि ऊर्ध्व (शिर) स्थित होगा तो माता को मारक होगा यदि अवाक्शिर होगा तो स्वयं को मारक होगा । अतः सभी अङ्गों-प्रत्यङ्गों को संकुचित करते तिर्यक् शयन करता है ।

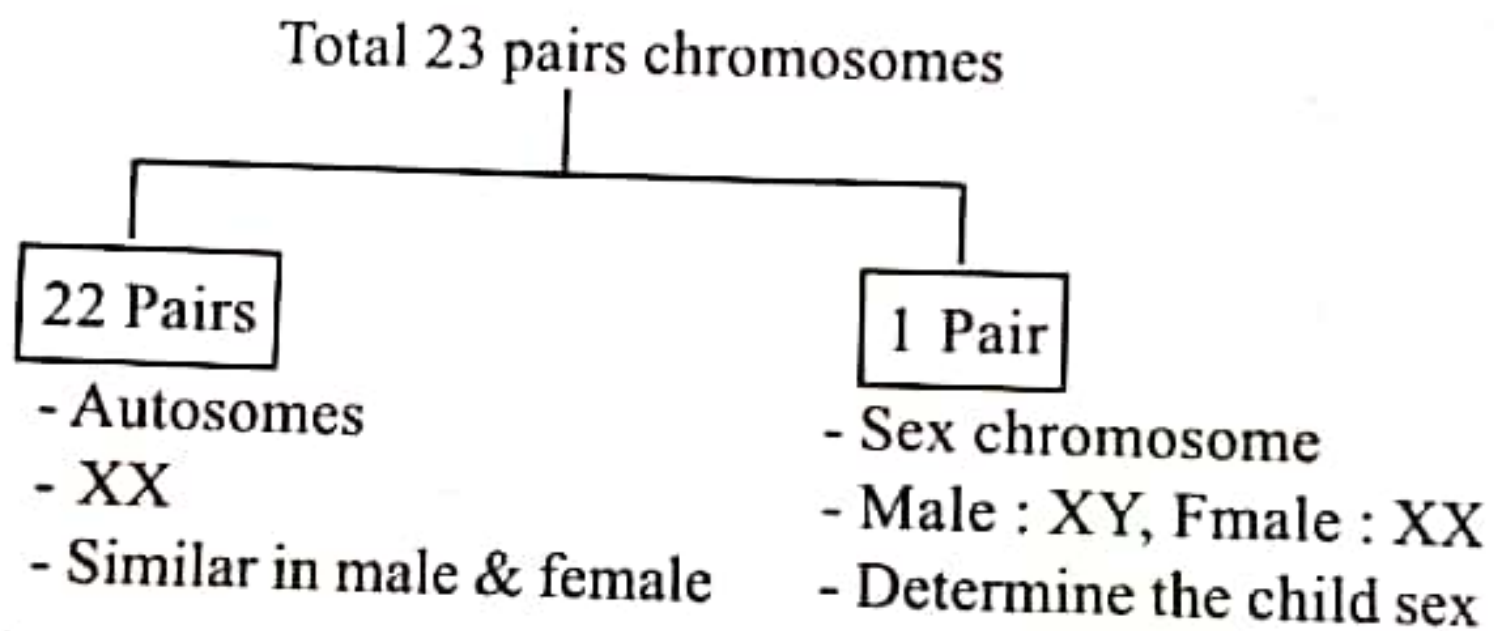


Conception

Conception is the beginning of pregnancy involving fertilisation and implantation of the embryo onto the uterine wall. Semen on intercourse gets deposited deep in the vagina at external os of cervix. Thousands of sperm swim up the uterine cavity and hundred or more reach outer third of fallopian tube within 5-10 minutes. Ovum retain fertilizable in tubal ampulla for 24 hours after ovulation while sperm retain its fertility for 24-48 hours after ejaculation in the vagina. The Ovum and sperm get fused into ampulla of fallopian tube.

Embryology

Embryology is the branch of science that studies the prenatal development of gametes, fertilization and development of embryos and foetuses.



The X and Y chromosomes are the sex determinant chromosomes. The mature chromosome ovum always contains X chromosome. If it is fertilised by a Y-bearing spermatozoa, the offspring will be a male. If it is fertilised by an X-bearing spermatozoa, the offspring will be a female.

Once the male and female cells have united, nothing can be done to change the sex of the newly formed individual. Whether this individual is male or female has a lifelong effect on the individual's patterns of behaviour and personality.

Periods of Prenatal Development

The average length of the prenatal period is 38 weeks or 266 days. However, 70% of babies vary from 36 to 40 weeks or 266 days and 98% range from 34 to 42 weeks (238-294 days). The prenatal period is divided into three stages.

These are :

- i) Period of the zygote - Fertilisation to end of second week.
- ii) Period of the embryo - End of the second week to end of the second lunar month.
- iii) Period of the foetus - End of the second lunar month to birth.

Fertilization

Definition

Fertilisation is fusion of gametes (spermatozoon mature ovum) to initiate the development of a new individual organism. It begins with sperm egg collision and ends with production of a mononucleated single cell called the zygote.

Capacitation of Spermatozoa

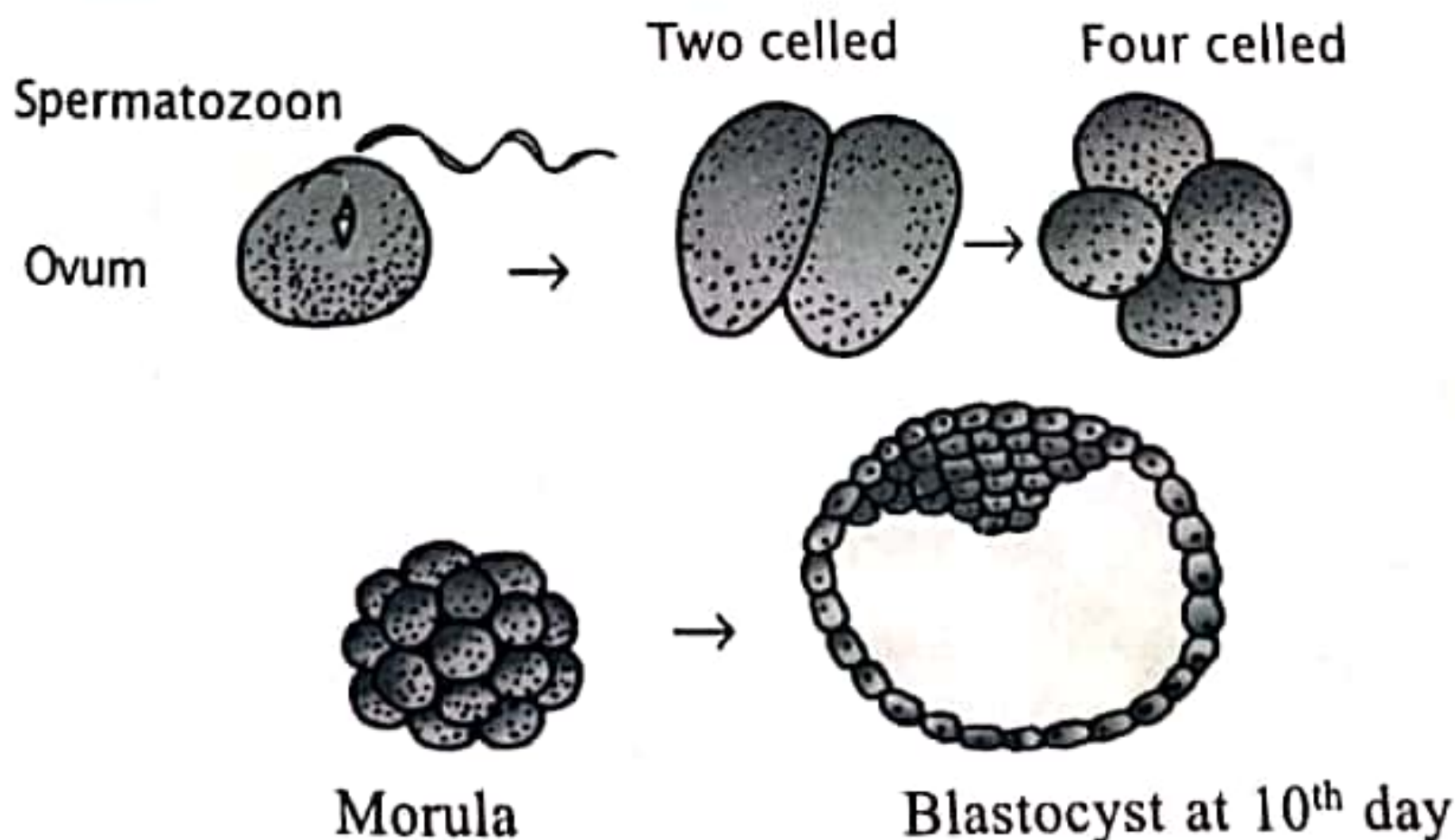
In the uterotubal canal sperm head undergoes biochemical changes called capacitation. The process causes release of enzyme hyaluronidase. On entry into the ovum, sperm tail dissolves, head and neck increases in size to form male pronucleus. Both female pronucleus (23 X) and male pronucleus (23 Y or 23 X) fuse to form single nucleus of zygote.

Sex of the fertilized ovum is determined by sex chromosome of fertilizing spermatozoon. If 23 X chromosome carrying sperm fertilizes 23 X ovum, female zygote (46 XX) forms. On the other hand when 23 Y chromosomes carrying sperm fertilizes ovum (23 X), male zygote (46 XY) results. Thus father's sperm determines sex of the baby.

Development of Zygote and Embryo

The sperm and the ovum are known as the male and female gametes respectively. The fertilized ovum is called zygote. The zygote undergoes various stages of development.

Zygote has forty six chromosomes - the twenty three that were in the egg originally and the additional twenty three contributed by the male. Less than two days after the sperm unites with the egg, the zygote divides into two cells. Then these two cells each divide again, and the process of division goes on, forming in nine months a new human being.



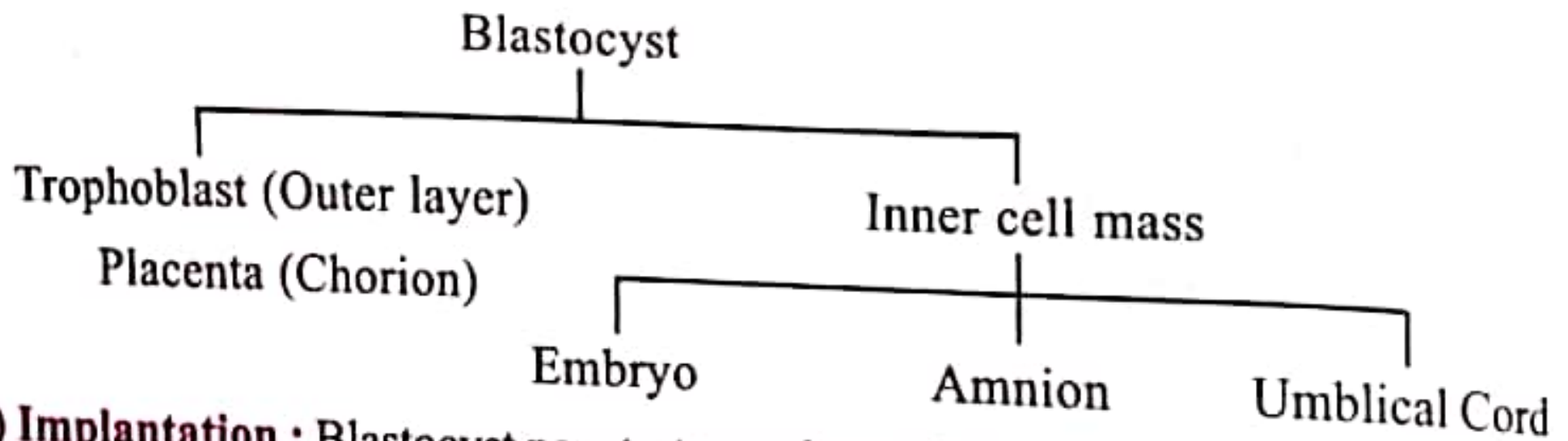
Development of fertilized ovum

REDMI NOTE 6 PRO
DUAL CAMERA

Development of the Fertilized Ovum

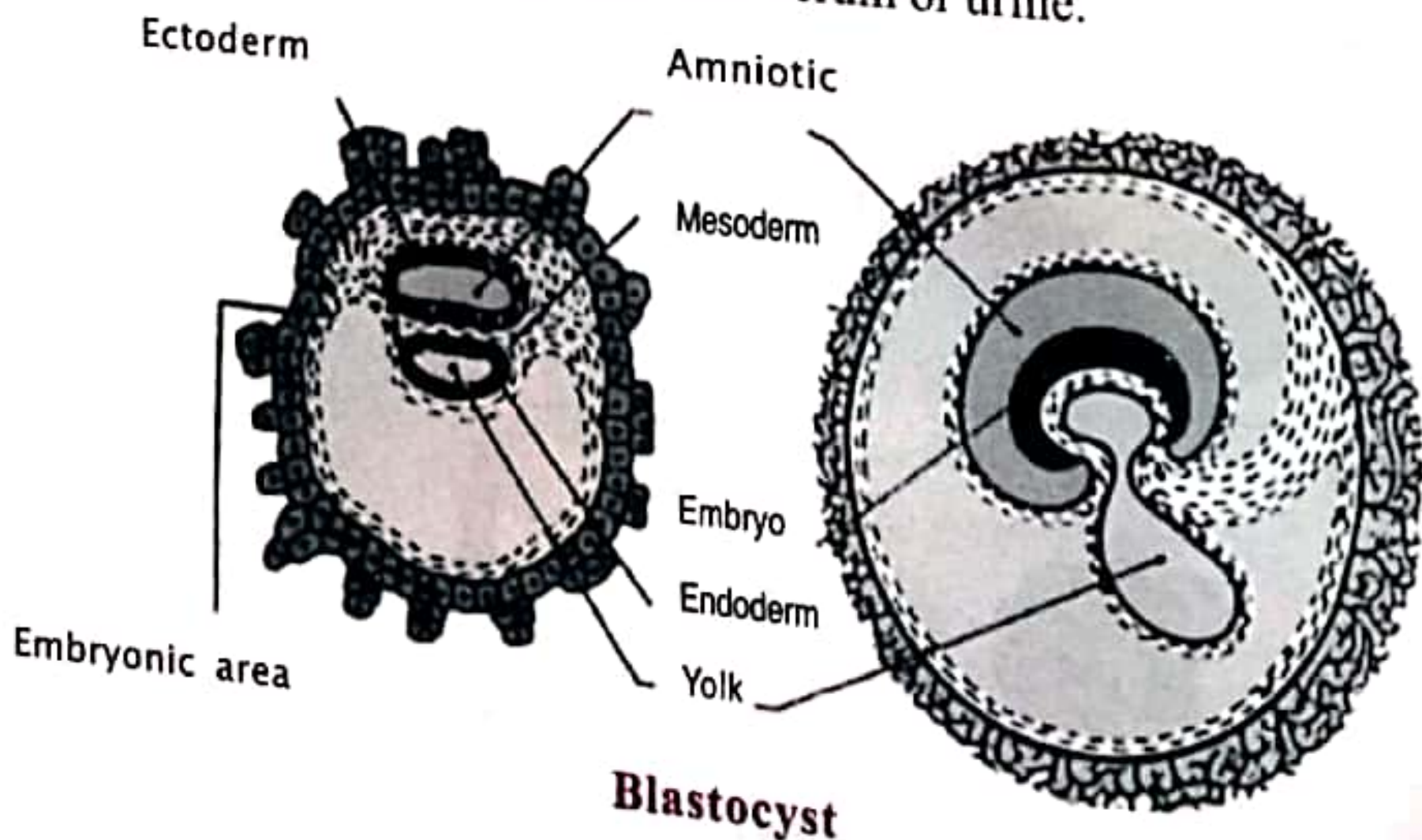
i) Ovum Stage : From single cell at fertilization the foetus grows to 6 billion cells at 38 weeks of pregnancy. When the ovum has been fertilized it continue its passage through the fallopian tube and reached the uterus 3-4 days later. During this time segmentation of cell division takes place. The fertilized ovum divides into two cells, then into four, then 8, 16 and so on until a cluster of cells is formed known as morula (mullberry). These divisions occur very slowly.

Blastocyst : Morula expands with accumulation of fluid in it, is called blastocyst. At one side of blastocyst cells proliferate to form inner cell mass which forms the embryo. The outer layer of flattened cells of blastocyst is called trophoblast which gets implanted into the endometrium and forms placenta.



ii) Implantation : Blastocyst penetrates endometrial surface and stroma in between glands by its histolytic action. Blastocyst enters into the compact layer of endometrium without any bulging.

Original point is seated by fibrin clot and later by epithelium. This is called interstitial implantation which is completed by the end of 10th day. By this time hCG is secreted by trophoblast that can be measured in maternal serum or urine.



MIDUAL CAMERA

Trophoblast : When blastocyst embeds into endometrium, outer trophoblast cells proliferate to form inner cytotrophoblast (Langhan's cell layer) and outer layer of multinucleated syncytium of plasmotrophoblast. Syncytiotrophoblast opens up spaces around, called lacunae which get filled up with maternal blood.

The trophoblastic epithelial layer becomes lined with mesenchyme runs continuously with that in inner cell mass.

iii) **Chorion and Chorionic Villi** : Trophoblastic cells lined internally with mesenchyme is called chorion. Finger like projections of trophoblastic layer projects out on the surface of embedded blastocyst – the Chorionic Villi.

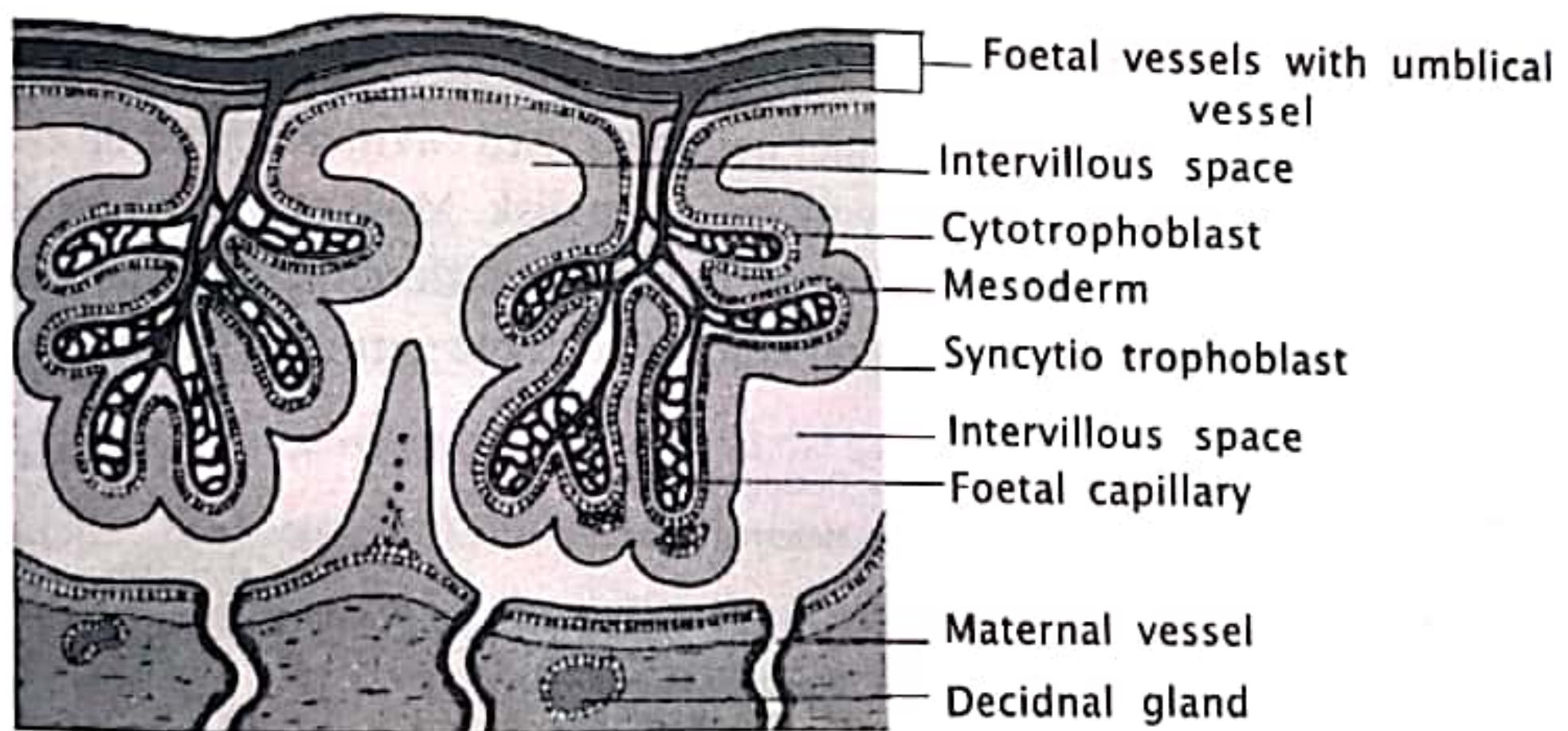
Types of Chorionic Villi

Primary chorionic Villi: Solid trophoblastic layer by 12th day of fertilization.

Secondary Villi: Villi with mesenchymal lining by 16th day.

Tertiary Villi : Secondary villi with blood vessels.

Villi lying on the side of uterine cavity atrophy (chorion laeve) and disappear but those on the side of uterine wall show branching (chorion frondosum) to form placenta.



Chorionic villi

iv) **Decidua** : This is the 5-10 mm thickened vascular endometrium of the pregnant uterus.

Structure of Decidua

It has three layers :

1) **Stratum Compactum** : Superficial layer containing gland duct. In this layer blastocyst implants.

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- 2) **Stratum Spongiosum:** Intermediate area with dilated glands. Through this layer separation of placenta and membranes occur.
- 3) **Stratum Basalis:** Thin basal layer containing deepest portions of glands is opposed on uterine muscle. From this layer new endometrium regenerates after parturition.

Changes of deciduas

After the embedding of ovum deciduas are renamed :

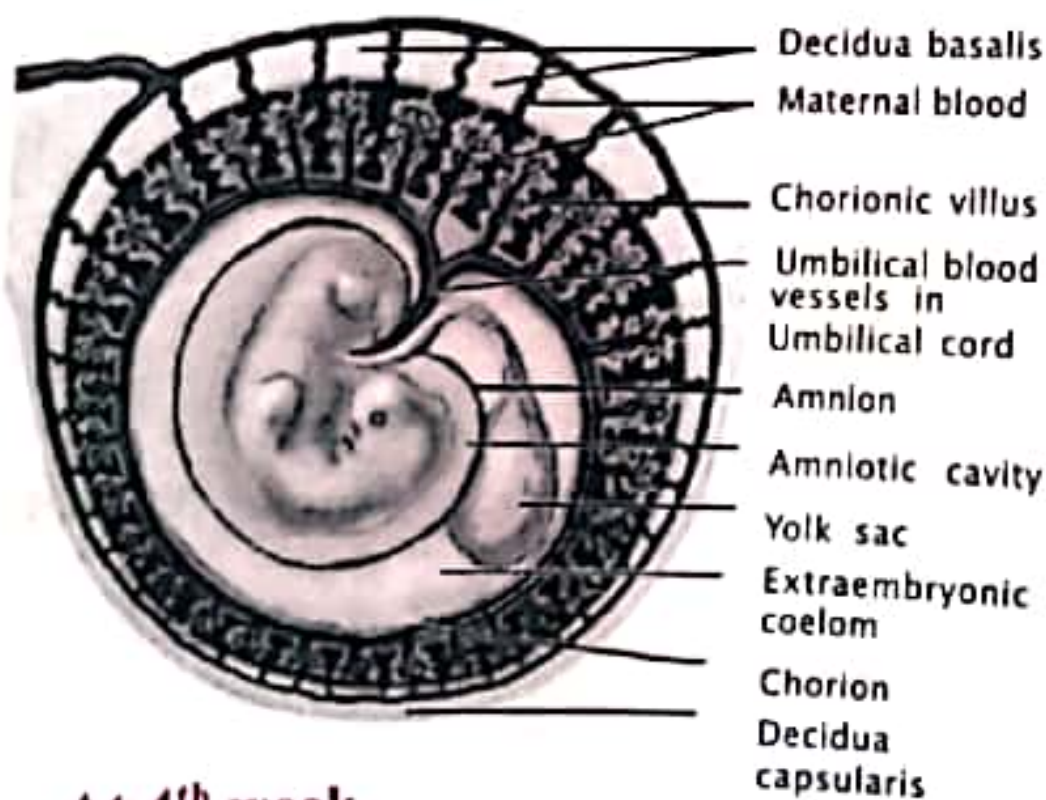
- 1) **Decidua Basalis:** Portion of deciduas lying between blastocyst and uterine muscle. This layer goes to form placenta.
- 2) **Decidua Capsularis:** The superficial layer of compact layer overlying blastocyst.
- 3) **Decidua Vera or Parietalis:** Rest of deciduas lining pregnant uterus except at the site of implantation.

Functions of Decidua

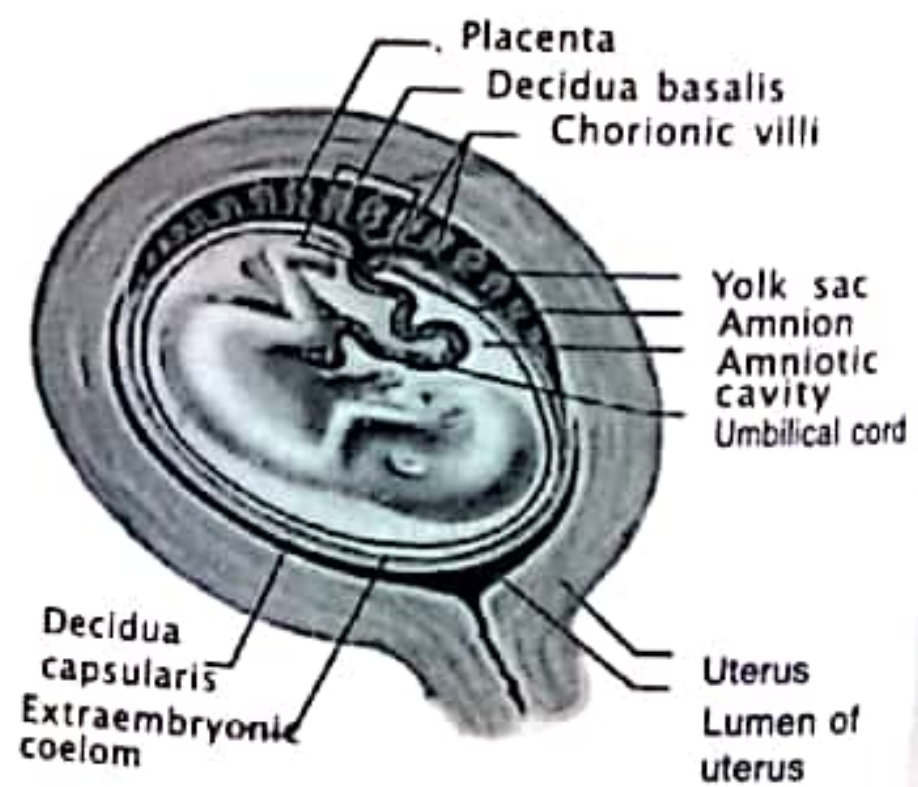
- 1) It provides soil for implantation of blastocyst.
- 2) It provides nutrition to blastocyst by glycogen and fat it contains.
- 3) It is protective against penetration of blastocyst by ground substance containing mucopolysaccharide.

Development of Embryo and Foetus

Along with the changes in inner cell mass, two cavities appear on each side of the germ disc, amniotic cavity and yolk sac germ disc. Most of the tissues and organs are developed during this period. The embryo can be differentiated as human at 8th week. Major structures which are developed from the three germinal layers:



At 4th week



At 13th week

The developing embryo

- a) **Ectoderm:** Central and peripheral nervous system, epidermis of skin, pituitary gland, salivary glands, mucous lining of the nasal cavity, paranasal sinus and roof of the mouth are formed from ectoderm.
- b) **Mesoderm :** Bones, cartilage, muscles, cardiovascular system, kidney, gonads, suprarenals, spleen, genital tract, mesothelial lining of pericardial, pleural and peritoneal cavity etc are formed from mesoderm
- c) **Endoderm:** Epithelial lining of the gastro intestinal tract, liver, gall bladder, pancreas, intestinal tract, epithelial lining of respiratory tract and most of the mucous membrane of urinary bladder and urethra.

(i) Development of Embryo

The embryo develops into a miniature human being. This stage begins on the 15th day after conception and continues until about the 8th week. During this period the cells of the embryo are not only multiplying, but they are taking on specific functions. This process is called tissue differentiation. It is during this critical period of differentiation (most of the first trimester or three-month period) that the growing foetus is most susceptible to damage from external sources (teratogens) including viral infections such as rubella, x-rays and other radiation, and poor nutrition.

At 3rd week :

- Formation of the heart begins.
- Beginning of development of the brain and spinal cord.
- Both kidneys and the inner ears develop at the same time.
- Beginning of the gastrointestinal tract.
- Teratogens introduced during this period may cause absence of one or more limbs or a heart that is outside of the chest cavity at birth.

At 4th & 5th week :

- Beginning of the vertebra, the lower jaw, the larynx (voice box), and the rudiments of the ear and eye develop.
- The heart, which is still outside the body, now beats at a regular rhythm.
- Arm and leg "buds" are visible with hand and foot "pads".
- Teratogens may cause very serious problems involving the esophagus, vertebrae, and eyes. The baby could be born with severe facial clefts or missing hands or feet.

At 6th week :

- Formation of the nose, jaw, palate, lung buds takes place.
- The fingers and toes form, but may still be webbed.
- The tail is receding, and the heart is almost fully developed.
- Teratogens at this point may leave the baby with profound heart problems or a cleft lip.

At 7th week :

- Eyes move forward on the face, and the eyelids and tongue begin to form. All essential organs have begun to form.
- Teratogens may cause heart and lung problems, a cleft palate, and ambiguous genitalia (not quite male or female).

At 8th week :

- Resembles a human being.
- The facial features continue to develop.
- The external ear appears.
- Beginning of external genitalia.
- The circulation through the umbilical cord is well developed.
- The long bones begin to form and the muscles are able to contract.
- Teratogens may still cause heart problems and stunting of the fingers and toes.

(ii) Development of foetus**At 9th-12th week :**

- Embryo is developed enough to call a foetus.
- All organs and structures found in a full-term newborn are present.
- The head comprises nearly half of the foetus' size and the face is well formed.
- The eyelids close now and will not reopen until about the 28th week.
- The tooth buds for the baby teeth appear.
- The genitalia are now clearly male or female.

At 13th-16th week :

- Skin of the foetus is almost transparent, fine hair develops on the head called lanugo.
- The foetus makes active movements, including sucking, which leads to some swallowing of the amniotic fluid.
- A thin dark substance called meconium is made in the intestinal tract.

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- The heart beats 120-150 beats per minute and brain waves are detectable.

At 17th-20th week :

- Eyebrows and lashes appear and nails appear on fingers and toes.
- The mother can feel the foetus moving (quickening) and also hear the heartbeat with the help of stethoscope.

At 21th-24th week :

- All the eye components are developed, footprints and fingerprints are formed.
- The entire body is covered in cream- cheese-like vernix caseosa.
- The foetus now has reflex action. Many reflexes, which are automatic and unlearned responses to specific stimuli appear eg. swallowing, coughing, and sucking.

At 25th-28th week :

- Rapid brain development of the foetus. The nervous system is developed enough to control some body functions.
- The eyelids open and close.
- A baby born at this time may survive, but the chances of complications and death are high at this period.

At 29th-32th week :

- Development occurs towards independent life. For example, respiratory movements are predicted even though oxygen is being provided through the placenta.
- There is a rapid increase in the amount of body fat and the foetus begins storing its own iron, calcium, and phosphorus.
- The bones are fully developed, but still soft and pliable.
- There are rhythmic breathing movements present, the foetal body temperature is partially self-controlled, and there is increased central nervous system control over body functions.

At 33th-36th week :

- The body hair begins to disappear.
- A baby born at 36 weeks has a high chance of survival.

At 38th week :

- The foetus is considered full term. It fills the entire uterus, and its head is the same size around as its shoulders.
- The mother supplies the antibodies to the foetus.



Embryo and Foetal Growth

Gestational age in week	Crown Rump length	Crown Heal length	Weight	Features Developed
Embryo Form	3 mm	—	—	Head, Tail, Heart, Gut
5				Gestational sac can be visible in ultrasound
6	4 mm	0.4 gm	0.4 gm	Neural tube, limb buds, chorionic villi
8	3 mm	3.5	2.0 gm	Limbs develop and embryo freely floats, eye, ear, nose, gonads, limbs develop
10	2.3 cm	4 cm	6 gm	Eyes developing, limb digits and all organs further develop. Doppler ultrasound can pick up foetal heart sound
12	8 cm	11.5 cm	14 cm	Foetus looks human being. Head is disproportionately large, skin pink, sex determined
16	13.5 cm	19 cm	100gm	Foetus active
20	18.5 cm	22 cm	300 gm	Languo hair
24	23 cm	32 cm	600 gm	Skin reddish, vernix appears, from 500 gm onward foetus attempt to breathe on birth but usually dies.
28	27 cm	36 cm	1000 gm	Foetus may survive, eyes open, testes in at inguinal canal
32	31 cm	41 cm	1800 gm	Foetus usually survive under proper care.
36	34 cm	46 cm	2500 gm	Testes in scrotum, foetus has excellent chances of survival
40	40 cm	50 cm	3200 gm	Finger nails extend beyond finger tips.

Factors Influencing Foetal Development

- i) **Mother's diseases** : Mother's diseases is the main cause of foetal death and their possible effects. German measles or rubella and cytomegalovirus diseases are among the most potentially dangerous of the infectious diseases in mothers. These diseases

that affect the mother also affects the child and thus affects adversely the development. Studies have shown that there is a high incidence of defective babies if women contracted rubella early in pregnancy. In any case if the rubella virus crosses the placenta; it can result in stillbirth, deafness, pre maturity, miscarriage, defects in pancreas, heart and liver. It may also lead to mental retardation. Mumps, polio and influenza are the other viruses which have teratogenic effects. Diabetic mother is as likely to give birth to infants with congenital malformations and their infant often will have respiratory difficulties soon after birth. Women who are suffering from blood poisoning during pregnancy frequently give birth to premature babies or to babies smaller than average babies. In case this blood poisoning is incurable, this may affect the mother and child both.

- ii) **Drugs and Chemicals** : For a healthy delivery it is necessary to avoid any kind of drugs and chemicals unless they are professionally recommended by the doctors. Alcohol, antihistamines, aspirin (excess doses), barbiturates, heroin, lead, quinine, thalidomide, insulin (large doses, used in shock therapy) and tobacco are the drugs and chemicals which affect the possible prenatal period development. In many cases, the drugs cause stunting or complete absence of the arms, legs, and fingers. Abnormalities of the internal organs may also occur.
- iii) **Radiation** : Radiation is responsible for causing damage to the foetus. Larger doses of therapeutic radiation may be injurious to the foetus and sometimes cause spontaneous abortion.
- iv) **Age of the mother**: The maternal age have a higher risk for infant defect, prematurity and infant death. In older woman (woman over 35 years) the ova, which have been present in an immature state from birth, may have been affected by aging or exposure to chemicals, drugs and other harmful agents. In young women (women under 18 years) the reproductive system may not be fully developed. Pregnant teenagers may also have generally poor prenatal care.
- v) **Nutrition or diet of the mother**: The mother is the only sole source of nutrition for the unborn child, a diet providing the proper balance of proteins, fats, carbohydrates, minerals, and vitamins is vital. The relationship between maternal diet deficiencies and prematurity, low birth weight, stillbirth, growth retardation, and poor mental functioning is observed.
- vi) **Stress in the mother**: The effects of maternal stress are less important than the effects of maternal nutrition but some studies strongly believe that maternal stress may affect the foetus development. It seems that maternal emotions could influence the growing child. The emotions act through the autonomic nervous system that activates

the endocrine glands, which, in turn, regulate the secretion of hormones such as adrenalin.

vii) Rh-incompatibility: The Rh factor, is an inherited protein found in the blood of 85% of the population. The problem arises when the male carries the Rh positive factor, the female carry the Rh negative factor and the foetus develops as Rh positive. If the sibling blood comes into contact with the mother's, the mother system may manufacture antibodies to ward off the foreign Rh protein. The antibodies destroy the foetal oxygen-carrying red blood cells, a condition known as erythroblastosis and death or mental retardation can occur.

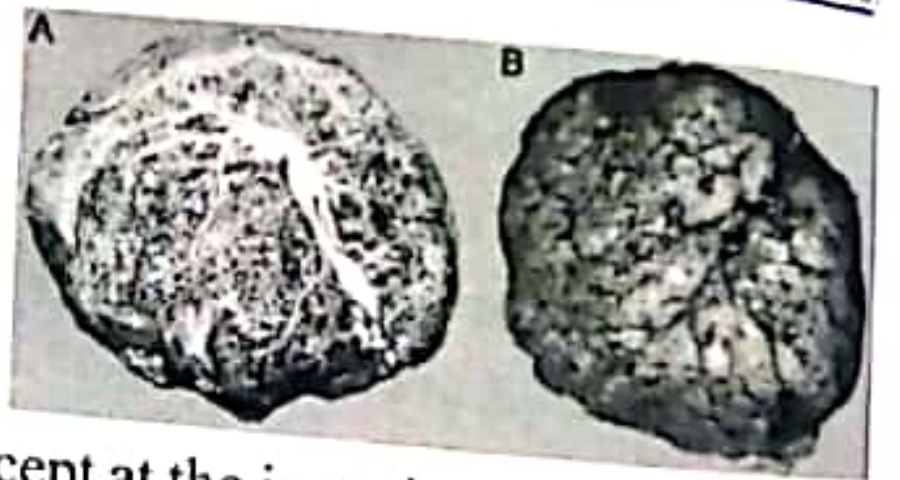
Placenta

Placenta is developed from chorionic frondosum and decidua. It begins at 6th week and completed by 12th week.

Placenta at Term

The placenta at term is almost circular disc with a diameter of 15-20 cm. It is 2.5 cm thick at its centre. It weighs about 500 gm or 1/6th of baby's weight. It has two surfaces:

A) Foetal surface: The foetal surface is covered by the smooth and glistening amnion with the umbilical cord attached near to its centre. Branches of the umbilical vessels are visible beneath the amnion as they radiate from the insertion of the cord. The amnion can be peeled off from the underlying chorion except at the insertion of the cord.



B) Maternal surface: It is rough and spongy. It is red dull colour. It has 15-20 lobes, known as cotyledons, separated from each other by furrow.

Placenta separates after the birth of the baby and the line of separation is through the decidua spongiosum.

The placenta is lined internally by the amniotic membrane and chorionic plate, externally by the basal plate and in between these two lies the choriodecidual space containing the stem villi with their branches. The space being filled with maternal blood.

Structures of Placenta from Foetal to Maternal Surface

- Amniotic membrane
- Chorionic plate
- Choriodecidual plate (maternal sinus)

Placenta villi

Two types of placental villi develop as:

- **Anchoring villi** : A few villus get attached to deciduas basalis.
- **Nutritive Villi** : Majority of chorionic villi, branch freely in the choriodecidual space. Primary villi branch to secondary and tertiary villi. These floats in the maternal sinus and provide nutrition to the foetus.

Placental Circulation

It consists of two independent circulation:

- a) **Maternal Circulation**: At term 120 spiral arteries enter maternal sinus. Venous blood is collected by venous channel.
- b) **Foetal Circulation**: Through umbilical cord two arteries spirally around umbilical vein carry venous impure blood from foetus to chorionic plate of placenta. Branches of umbilical artery enters to each villus. Single umbilical vein emerging from placenta into umbilical cord carries oxygenated blood. Foetal and maternal blood streams flow side by side in opposite direction. Foetal blood has higher oxygen carrying capacity due to red cells carrying foetal haemoglobin.

Placental Aging

Placenta has limited life span. Near term pregnancy normal placenta shows white infarcts - degenerated villi with deposition of fibrin and calcium. These infarcts are more common at placental margin.

Functions of Placenta

1. **Foetal respiratory function** : By simple diffusion, oxygen goes to foetal circulation from maternal sinus and carbon dioxide diffuses out.
2. **Foetal alimentary function** : All nutrient such as glucose, aminoacids, lipids, vitamins, minerals, water and electrolytes pass from maternal sinus to foetal circulation.
3. **Foetal excretory function** : Placenta acts as a foetal kidney by excreting small amount of placental hormones and steroids hormones.
4. **Foetal barrier functions** : This prevents large molecular size substance to pass from mother to foetus. Currently this barrier function is considered a myth since many infective organisms; drugs easily cross over to the foetus.
5. **Enzyme function** : Various enzymes are involved in hormone synthesis and metabolism are elaborated by placenta.
6. **Immunological function** : Transfer of maternal IgG to the foetus and filters out potentially harmful cytotoxic antibodies.

Abnormalities of Placenta

- 1) **Large placenta** : Occur in syphilis, diabetes mellitus and erythroblastosis.

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- 2) **Placenta succenturiata:** One or more small accessory lobes lie away from the main mass containing blood vessels. Clinical importance is that it can be retained after the main placenta is expelled producing postpartum haemorrhage.
- 3) **Bipartite or tripartite placenta:** There are two or three almost equal lobes lying close to each other. Foetal vessels extend from one lobe to other before uniting at umbilical cord. This may cause antepartum haemorrhage and retained placenta.



The umbilical vessels bifurcate at the point of insertion of the cord

Placenta bipartite

- 4) **Battle dore Placenta:** In this the cord is situated at the very edge of placenta.

Umbilical Cord (Funic)

Umbilical cord or Funic is a long cord like structure that connects the foetal umbilicus with foetal surface of placenta. It is developed from body stalk of mesodermal cells stretching between embryonic disc and chorion.

i) **Structure of Umbilical Cord at Term :** It is bluish white cord about 50 cm long and 1.5 cm in diameter. Three blood vessels are embedded in it - one umbilical vein and two umbilical arteries. It is twisted spirally from left to right. There are collections of Wharton's jelly at places. These are false knots.

Umbilical cord attached foetus to placenta. It is covered by amnion. Underneath Wharton's jelly supports the blood vessels.

ii) Functions

- It is the life line between placenta and foetus supplying oxygen and nutrients for foetus and disposing waste products.
- Exchange of fluid and electrolyte between umbilical vessels and amniotic fluid.

iii) Abnormalities of Cord

- Short cord less than 30 cm.
- No cord (achordia).
- Long cord 100-300 cm long. Long cord may lead to prolapse of the cord before and

- during labour.
- True knots.
 - False knots due to collection of Wharton's jelly.
 - Loop around the neck, may be once, twice or three times.
 - Single artery in umbilical cord.

Liquor Amnii (Amniotic Fluid)

The watery alkaline fluid of amniotic sac in which embryo, foetus grows is called the amniotic fluid.

- i) **Physical Characteristics** : It is clear fluid in early pregnancy. In mid-pregnancy due to more bile pigments it becomes yellow. But in late pregnancy it is colourless as bilirubin becomes negligible. It also contains vernix caseosa and desquamated epidermis.
- ii) **Volume**: Amniotic fluid is detected at 8 weeks of pregnancy and its average volume varies. At 38 weeks the amount is 1000 ml, at 40 weeks 800 ml and at 43 weeks 200 ml

iii) Composition:

a. Water 98-99%

b. Organic substances:

Protein	→	0.25 gm%
Uric Acid	→	4 mg%
Creatinine	→	1.8 mg%
Glucose	→	20 mg%

Lipids, phospholipids, bilirubin, hormones (Prolactin), vitamins, prostaglandins.

c. Inorganic substances :

- Electrolytes – (Na, K, Cl) same as in maternal plasma.
- iv) pH is 7.2
- v) Specific gravity is 1.008
- vi) **Sources of Amniotic Fluid**
- Foetal urine
 - Exudation of umbilical vessels
 - Amniotic epithelium

v) Functions

During Pregnancy :

- It helps in foetal growth.

- It protects foetus from external injuries.
- Maintains even temperature for foetus.
- Foetus swallow liquor after 16 weeks 450 ml daily.
- Allows free movements of foetus and prevents adhesions.
- Serves immunological, biochemical and hormonal functions.

During Labour :

- Helps in dilatation of cervical os.
- Protects foetus and placenta from direct pressure from contracting uterus.
- Fore waters washes the vagina before birth of baby preventing infection of baby and uterine cavity and the hind waters clears the birth passage after the baby is born.

Amniotic fluid abnormalities

1. Polyhydramnios

Polyhydramnios is a medical condition describing an excess of amniotic fluid in the amniotic sac. It is seen in about 1% of pregnancies. It is typically diagnosed when the amniotic fluid index (AFI) is greater than 24 cm or liquor amnii exceeds 2000 ml.

There are two clinical varieties of polyhydramnios: chronic polyhydramnios where excess amniotic fluid accumulates gradually, and acute polyhydramnios where excess amniotic fluid collects rapidly.

Cause :

1. In most cases, the exact cause cannot be identified.
2. A single case may have one or more causes, including intrauterine infection (TORCH), Rh-isoimmunisation, or chorioangioma of the placenta.
3. In a multiple gestation pregnancy, the cause of polyhydramnios usually is twin-to-twin transfusion syndrome.
4. Maternal causes include cardiac disease, kidney disease, and maternal diabetes mellitus, which causes foetal hyperglycemia and resulting polyuria (foetal urine is a major source of amniotic fluid).

5. Complications in foetus :

- **Gastrointestinal abnormalities** such as oesophageal atresia and duodenal atresia (causing inability to swallow amniotic fluid), anencephaly, facial cleft, neck masses, tracheoesophageal fistula, and diaphragmatic hernias. An annular pancreas causing obstruction may also be the cause.
- **Bochdalek's hernia**, in which the pleuro-peritoneal membranes (especially the left) will fail to develop and seal the pericardio-peritoneal canals. This results in the

stomach protrusion up into the thoracic cavity, and the foetus is unable to swallow sufficient amounts of amniotic fluid.

- **Foetal** renal disorders that result in increased urine production during pregnancy, such as in antenatal Bartter syndrome.
- **Neurological abnormalities** such as anencephaly, which impair the swallowing reflex. Anencephaly is failure of close of the rostral neuropore (rostral neural tube defect). If the rostral neuropore fails to close there will be no neural mechanism for swallowing. Open spina bifida leads to increase transudation from the meninges.
- **Chromosomal abnormalities** such as down syndrome, edwards syndrome, sacrococcygeal teratoma, skeletal dysplasia, or dwarfism. There is a possibility of the chest cavity not being large enough to house all of the baby's organs causing the trachea and esophagus to be restricted, not allowing the baby to swallow the appropriate amount of amniotic fluid.

Mild and moderate polyhydramnios showed that apgar score of less than 7, perinatal death and structural malformations only occurred in women with severe polyhydramnios. All patients with polyhydramnios, that had a sonographically normal foetus, showed no chromosomal anomalies.

Diagnosis

There are several pathologic conditions that can predispose a pregnancy to polyhydramnios. These include a maternal history of diabetes mellitus, Rh incompatibility between the foetus and mother, intrauterine infection, and multiple pregnancies.

During the pregnancy, certain clinical signs may suggest polyhydramnios. In the mother, the obstetrician may observe increased abdominal size out of proportion for her weight gain and gestation age, uterine size that outpaces gestational age, shiny skin with stria (seen mostly in severe polyhydramnios), dyspnea, chest heaviness, palpitations, pedal oedema and varicosities in legs or vulva. When examining the foetus, foetal parts cannot be well defined and faint foetal heart sounds are also an important clinical sign.

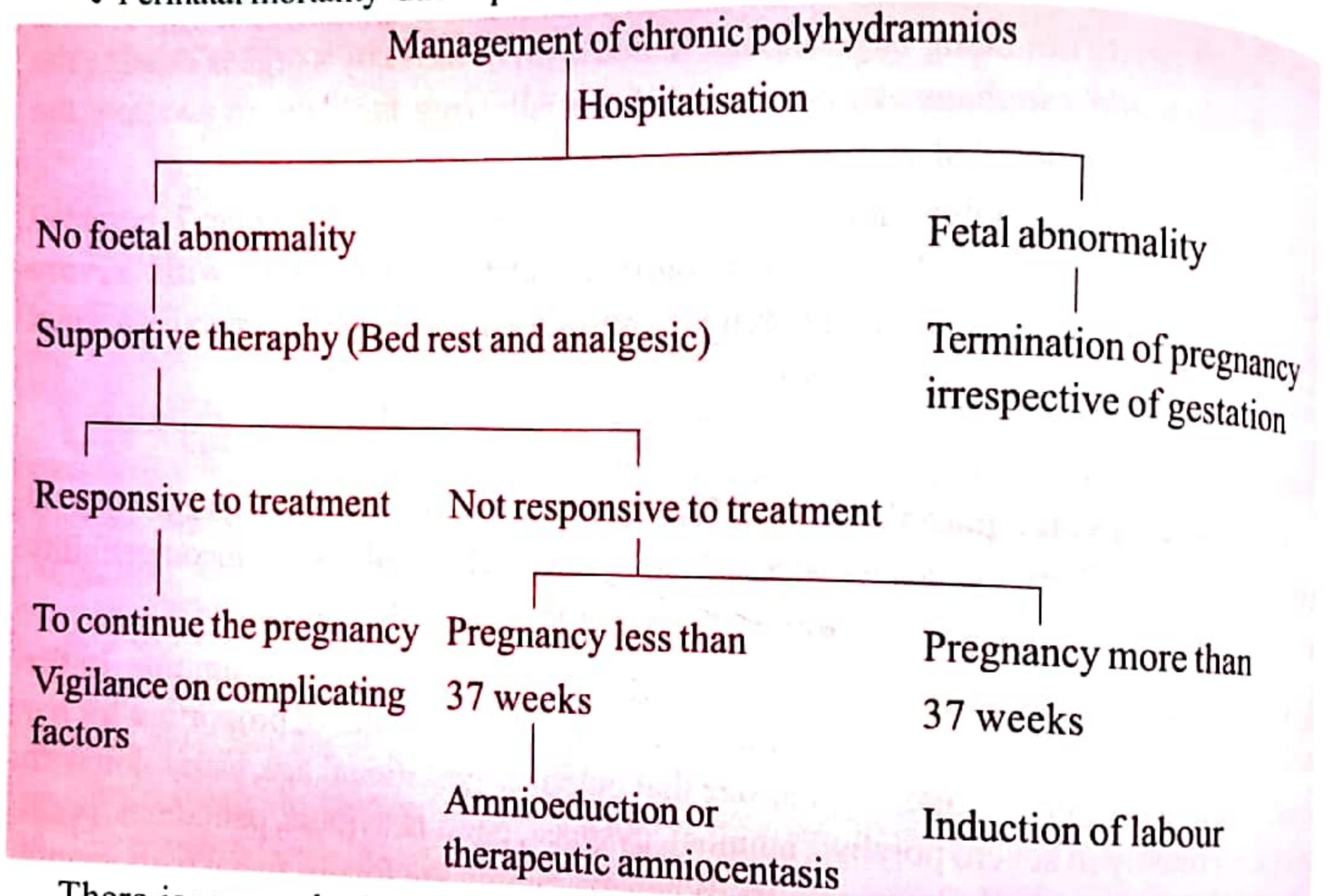
Investigations :

- Ultrasonography
- ABORh
- FBS, PPBS
- Estimation of alpha feto protein (increased in open neural tube defect)

Complications of polyhydramnios

- Pre-eclampsia
- Malpresentation

- Premature rupture of membrane
- Preterm labour
- Antepartum haemorrhage
- Cord prolapse
- Uterine inertia
- Increased operative interference
- Post partum haemorrhage
- Shock
- Perinatal mortality due to prematurity and congenital abnormality.



There is no need of treatment in case of mild polyhydramnios and therapeutic amniocentesis is required in acute polyhydramnios.

2. Oligohydramnios

It is a condition in pregnancy characterized by a deficiency of amniotic fluid. It is the opposite of polyhydramnios.

Cause

- Foetal chromosomal anomalies like triploidy,
- Intra uterine infections,

- Premature rupture of membrane,
- Drugs : PG inhibitors like indomethacin , ACE inhibitors,
- Renal agenesis or obstruction of the urinary tract of the foetus preventing micturition such as posterior urethral valves in males,
- Intrauterine growth restriction (IUGR) associated with placental insufficiency,
- Amnion nodosum : failure of secretion by the cells of the amnion covering the placenta
- Postmaturity (dysmaturity).

Sign and Symptoms

The common clinical features are smaller symphysis-fundal height, foetal malpresentation, and undue prominence of foetal parts and reduced amount of amniotic fluid.

Diagnosis

- Uterine size is much smaller than the period of amenorrhoea,
- Fewer foetal movements,
- The uterus "full of foetus" because of scanty liquid,
- Malpresentation (breech),
- Evidences of IUGR of the foetus,
- Sonographic diagnosis is made when largest liquid pool is less than 2 cm,
- Visualization of normal filling and emptying of foetal bladder essentially rule out urinary tract abnormality,
- Oligohydramnios with foetal symmetric growth retardation is associated with increased chromosomal abnormality.

Complications

Complications may include cord compression, musculoskeletal abnormalities such as facial distortion and clubfoot, pulmonary hypoplasia and intrauterine growth restriction. Amnion nodosum is frequently also present.

Potter syndrome is a condition caused by oligohydramnios. Affected fetuses develop pulmonary hypoplasia, limb deformities, and characteristic facies. Prolonged labour, increased operative interference & high foetal mortality are also associated.

Treatment

- Simple maternal hydration appears to increase amniotic fluid volume and may be beneficial in the management of oligohydramnios and prevention of oligohydramnios during labour or prior to external cephalic version.

- In severe cases oligohydramnios may be treated with amnioinfusion during labour to prevent umbilical cord compression.
- In case of congenital lower urinary tract obstruction, foetal surgery seems to improve survival.

Vernix caseosa

Vernix caseosa is the waxy or cheese-like white substance found coating the skin of newborn human babies. It is produced by dedicated cells and is thought to have some protective roles during foetal development and for a few hours after birth.

Composition

- Vernix has a highly variable makeup but is primarily composed of sebum, cells that have sloughed off the foetus's skin and shed lanugo hair.
- 12% of the dry weight of vernix is composed of branched chain fatty acids, cholesterol and ceramide.
- Vernix of term infants has more squalene and a higher wax ester to sterol ester ratio than preterm infants.
- Lipid components of vernix caseosa delivered from stratum corneum (sebaceous glands).
- About 20 proteins identified in vernix caseosa.

Morphology

Cells of vernix are typically polygonal or ovoid in shape and lack nuclei. Nuclear ghosts are frequently observed. Vernix corneocytes lack desmosomal attachment and this distinguishes them from corneocytes found in mature stratum corneum. Thickness of a corneocyte is 1-2 μm . These cells are surrounded by a layer of amorphous lipids lacking typical lamellar architecture present in mature stratum corneum.

Secretion

The sebum in vernix is produced in utero by the sebaceous glands around the 20th week of gestation. Vernix appears primarily in full term infants, while premature and postmature births generally do not display any. Postdates desquamation (flakey skin in babies born >42 weeks) is thought to be due to loss of vernix.

Function

Vernix serves several purposes, including moisturizing the infant's skin, and facilitating passage through the birth canal. It serves to conserve heat and protect the delicate newborn skin from environmental stress. Vernix is also thought to have an antibacterial

effect; though there is little evidence to support a chemical role of vernix in protecting the infant from infection, it may form a physical barrier to the passage of bacteria.

Foetal Membranes

Foetal membranes are of two layers :

- a) **Outer Chorion:** It forms outer layer of foetal membranes formed out of chorionic leave and ends at placental margin. It is thicker than amnion but friable and shaggy on both sides. It consists of two layers of trophoblastic epithelium lined internally by mesoderm.
- b) **Inner Amnion:** It is the inner layer of foetal membranes. It is smooth, shiny and slippery that lies in contact with amniotic fluids. It is tough membrane.

Functions of Foetal Membrane

- 1) Protective for foetus
- 2) Form liquor amnii
- 3) Prevents infection
- 4) Facilitates cervical dilatation
- 5) Shows enzymatic activities
- 6) Serves as a source of precursor of prostaglandin.

Foetal Circulation

Embryo develops separate circulation from 16th week after fertilization. Foetal heart starts beating from 21st day of fertilization. Foetus in utero derives oxygen from placenta.

Course of foetal circulation: From placenta single umbilical vein carries oxygenated (80%) blood, goes to liver through foetus umbilicus and branches out into two one large and one small branch.

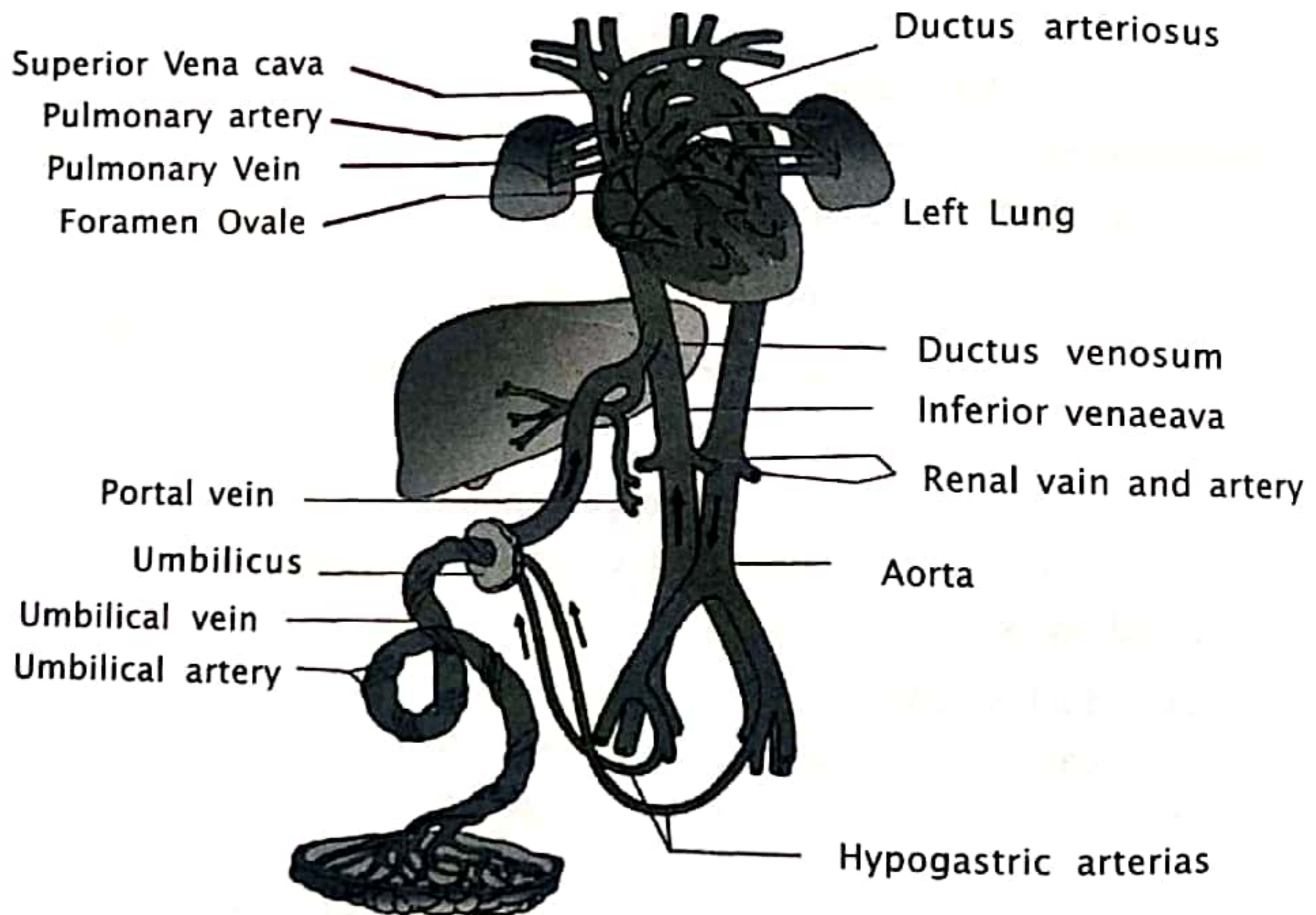
Large branch (ductus venosum) by pass the liver to enter inferior vena cava and then to right atrium of heart. Oxygen saturation of blood at inferior vena cava before entry of heart is 65%. A small branch unit with portal vein goes to liver wherefrom hepatic veins drain into inferior vena cava.

55% of blood from right atrium goes to left atrium through foramen ovale, from left atrium to left ventricle and is pumped to coronary arteries and aorta. From aorta blood with 60% oxygen saturation is pumped to head, neck and superior extremities. 25 % blood in right atrium mixes with blood from superior vena cava draining head, neck and upper extremities into right ventricle. Then blood is pumped to pulmonary artery. This blood goes to collapsed lungs and is drained back into left atrium by pulmonary veins.

Its large part is shunted to descending aorta then to abdominal aorta with 60% oxygen saturation. The major part of blood from abdominal aorta enters two internal iliac arteries. These arteries run towards umbilicus and enter the cord as two umbilical arteries which carry venous blood to placenta for purification.

Changes in Circulation after Birth

- 1) Closure of ductus venosum and becomes ligamentum venosum. Umbilical vein becomes ligamentum teres by one year time.
- 2) Closure of ductus arteriosus occurs after establishment of pulmonary ventilation. Ductus arteriosus becomes ligamentus arteriosum.
- 3) Closure of foamen ovale occurs due to rise in pressure in left atrium and close foramen ovale gives fossa ovalis.
- 4) Obliterated umbilical arteries form lateral umbilical ligaments. Functional closure occurs soon after birth but anatomical closure occurs in about one year time.



Foetal Circulation

The Foetus - in - Utero

The foetus lie inside the uterus in a closed sac with liquor amnii and free to move inside and changes in their lie, presentation, position and attitude until later weeks of

pregnancy. At the onset the labour one must follow pneumonic Lapped :

- L - Lie
- A - Attitude
- P - Presentation
- P - Position
- E - Engagement
- D - Denominator

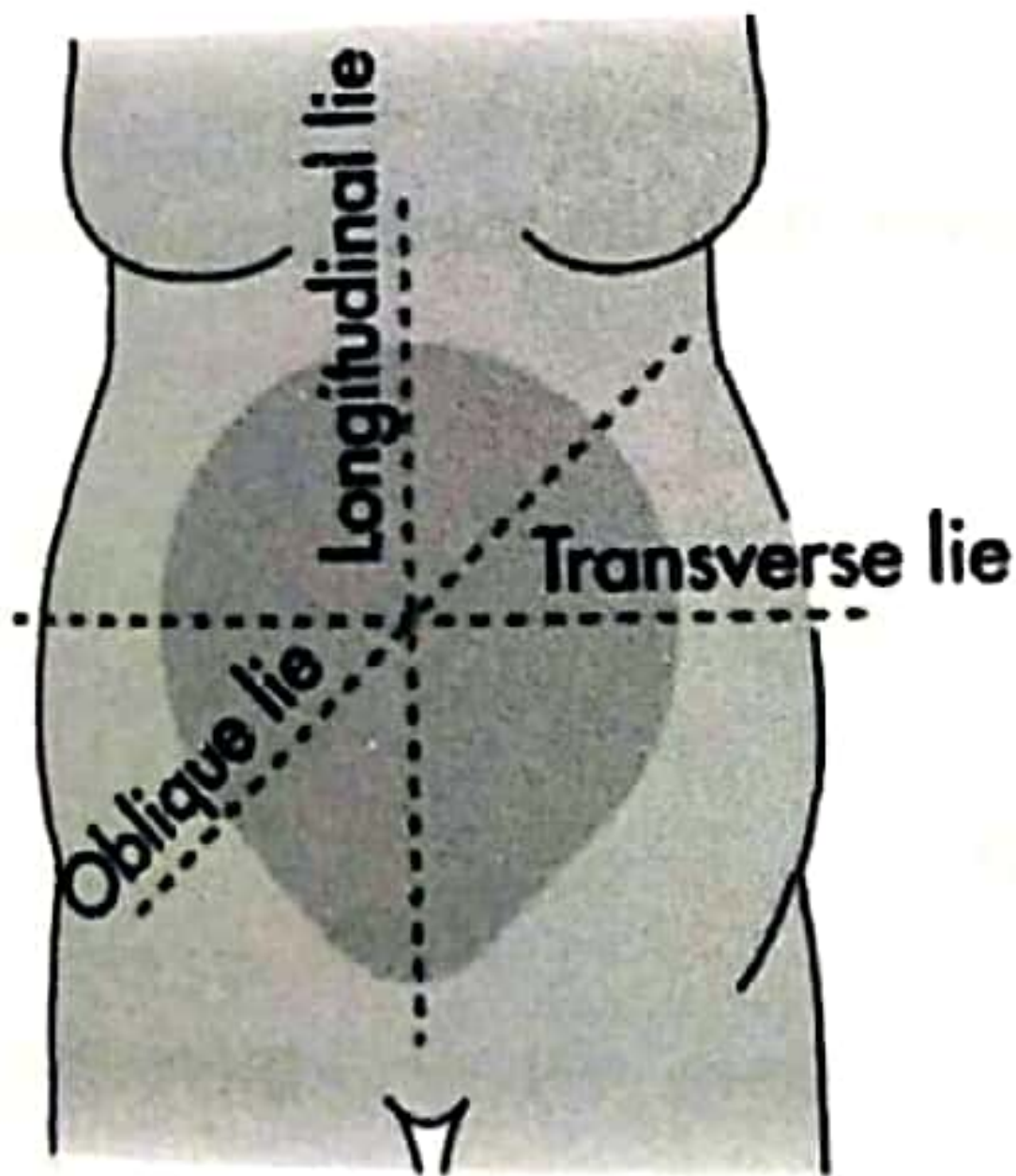
Foetal Lie

Foetal lie is the relationship of the long axis of the foetus to the long axis of the mother uterus or spine.

Normal lie- longitudinal lie- foetus's long axis is in line with the mother's uterus with its head down in cephalic or buttock down breech presentation

Abnormal lie- It is other than longitudinal lie e.g.

- Oblique (unstable, will eventually become either transverse or longitudinal)
- Transverse (resulting in shoulder presentation)
 - a. Back up
 - b. Back down (indication for vertical uterine incision during cesarean delivery)



Foetal Attitude

The relation of the different parts of the foetus to one another is called attitude of the foetus. The universal attitude is the that of flexion.

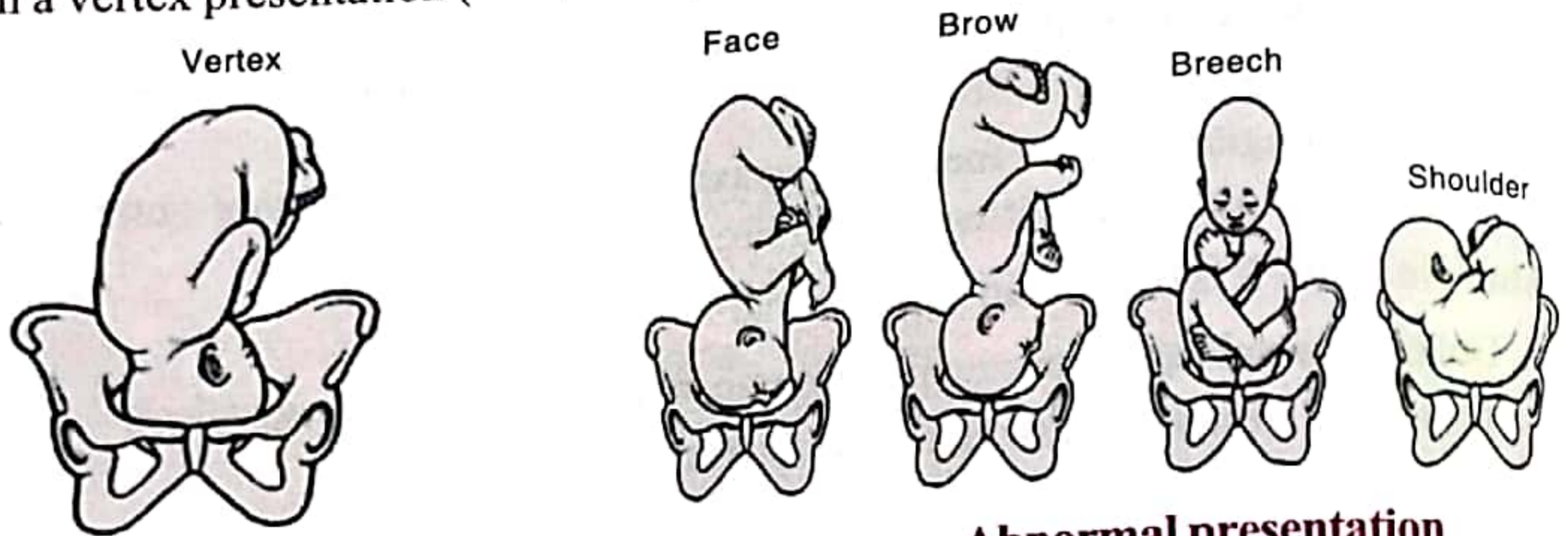
- Flexed (this is the normal situation)
- Extended (Deflexed vertex, brow or face, according to degree of extension).

- Legs may extended in breech

The head, trunk, limbs of the foetus maintain the attitude of flexion on all joints and from the shape of uterine ovoid in latter months of pregnancy.

Foetal Presentation

It refers to which anatomical part of the foetus is leading, i.e. closest to the pelvic inlet of the birth canal during labour. According to the leading part, this is identified as a cephalic, breech, or shoulder presentation. A malpresentation is any presentation other than a vertex presentation (with the top of the head first).



Normal presentation

Abnormal presentation

Thus the various presentations are:

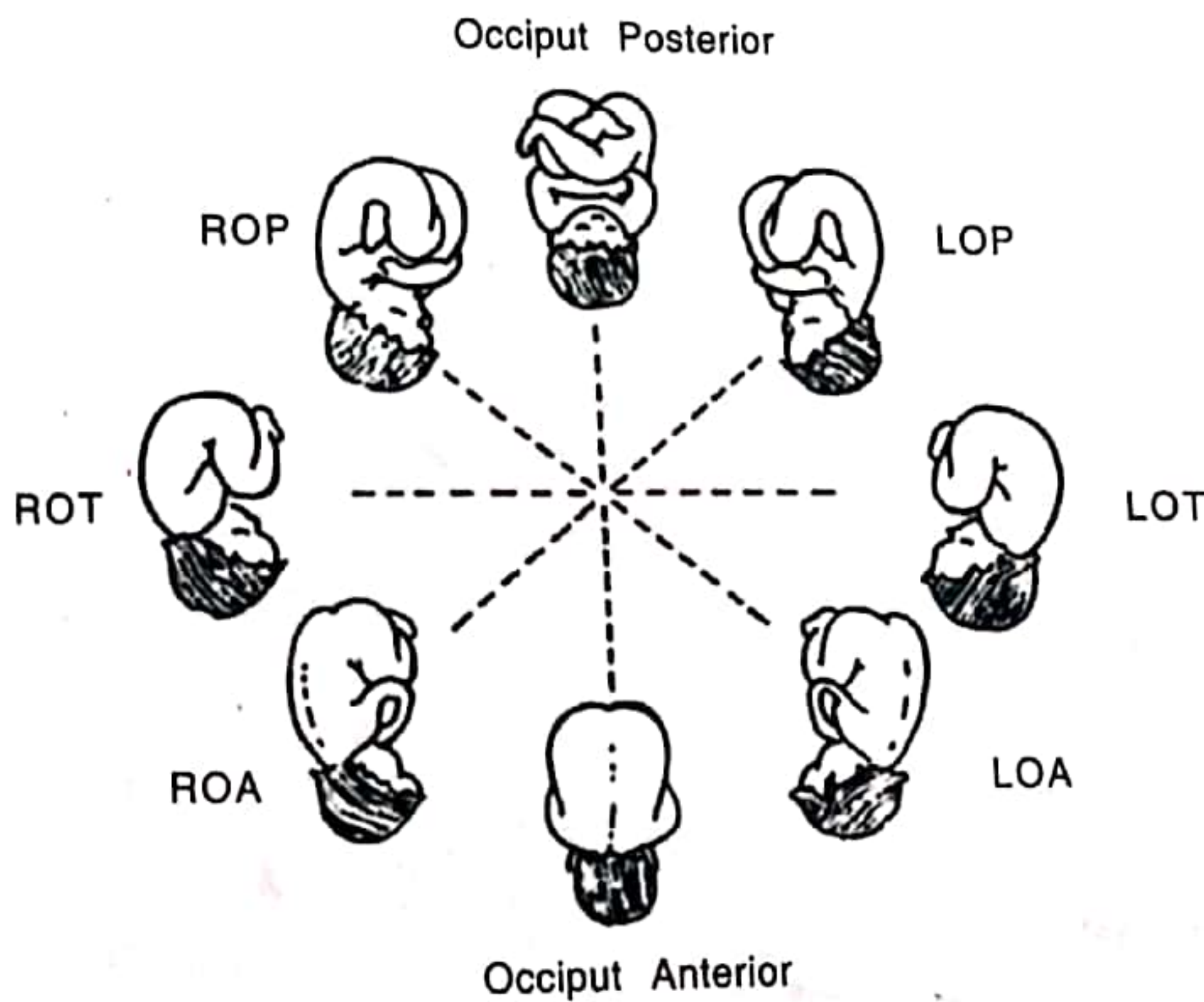
1. Cephalic presentation (head first) : 96.5%
 - a. Vertex (crown) - the most common and associated with the fewest complications
 - b. Sinciput (forehead)
 - c. Brow (eyebrows)
 - d. Face
 - e. Chin
2. breech presentation (buttocks or feet first) : 3%
 - a. Complete breech
 - b. Footling breech
 - c. Frank breech
3. Shoulder presentation : 0.5%
 - a. Arm
 - b. Shoulder
 - c. Trunk
4. Compound presentation - when any other part presents along with the foetal head.

Foetal Position

Position is the relation of denominator to the different quadrants of pelvis. The pelvis is divided into 8 equal segments of 45° to place the denominator in each segment. Thus, theoretically, there are 8 positions with each presenting part :

- **LOA**- Left Occiput Anterior (most frequent)
- **LOT**- Left Occiput Transverse
- **LOP**- Left Occiput Posterior
- **OP** - Occiput Posterior
- **ROA** - Right Occiput Anterior
- **ROT** - Right Occiput Transverse
- **ROP** - Right Occiput Posterior
- **OP** - Occiput Posterior.

(Where Occiput refers to Occipital Bone position)

**Engagement**

Engagement means that most of the foetus has descended into the mother's pelvic cavity and only a small part can be felt abdominally.

Denominator

It is an arbitrary bony fixed point in the presenting part which comes in relation with the various quadrant of maternal pelvis e.g. Occiput in vertex, mentum in face, sacrum in breech and acromion in shoulder.

Anatomy of Foetal Skull

Normally the foetus is in an attitude of universal flexion. With flexion attitude, foetus forms an ovoid mass. Dimensions of this ovoid foetal mass are described in terms of:

1. Vertico-podalic diameter (V-P)
2. Bis-acromial diameter (A-A)
3. Bi-trochanteric diameter (T-T)

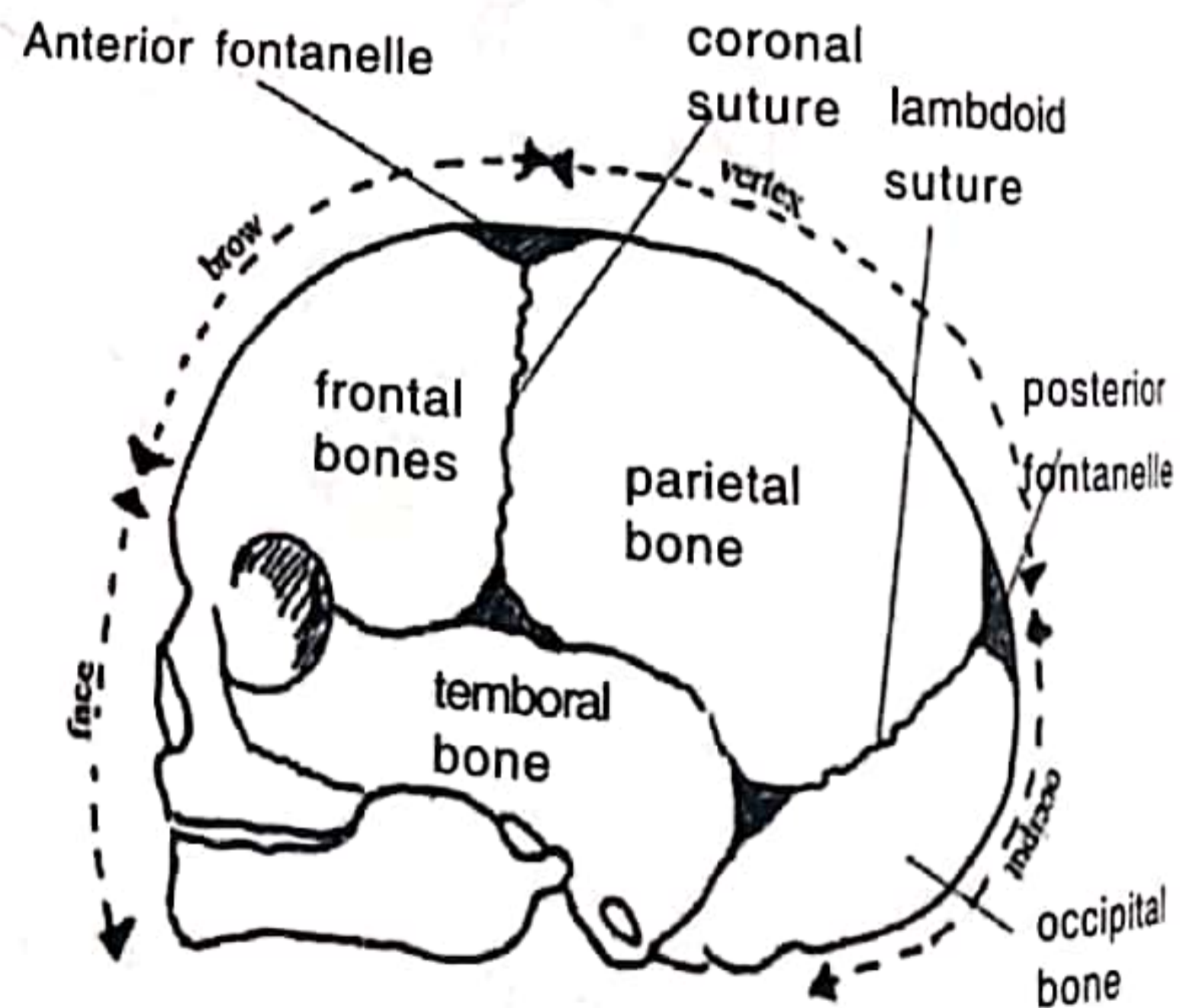
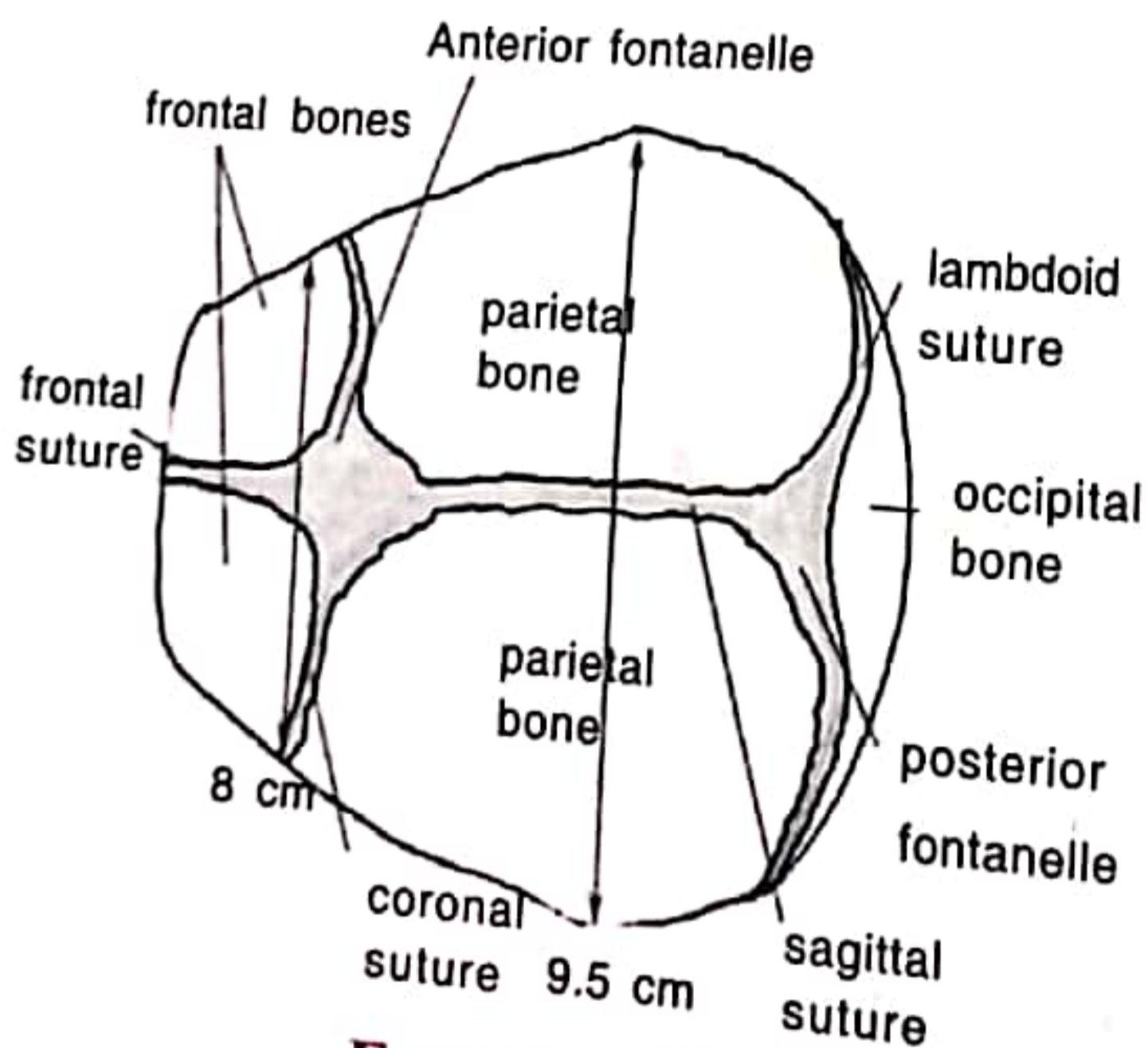
In normal pregnancy, long axis of the foetus corresponds with long axis of the uterus, i.e. longitudinal lie, and the presentation is cephalic. In majority of cephalic presentations, presenting part is vertex. This suggests that head is well flexed.

The vertex is an area of the vault of the foetal skull, bounded in front by the anterior fontanelle and coronal suture, behind by the posterior fontanelle and lambdoidal suture and laterally by lines passing through the parietal eminences.

In the head, other than the vertex, it can be face or brow presentation. The face presentation extends from root of the orbital ridges and root of the nose to the junction of the chin and neck. Chin (mentum) is the landmark.

Brow extends from the anterior fontanelle and coronal suture to the orbital ridges.

The foetal skull at term is not completely ossified. The bones of the vault are thin, pliable, and are separated by sutures and fontanelle (unossified membranes). The base of the skull is firm.



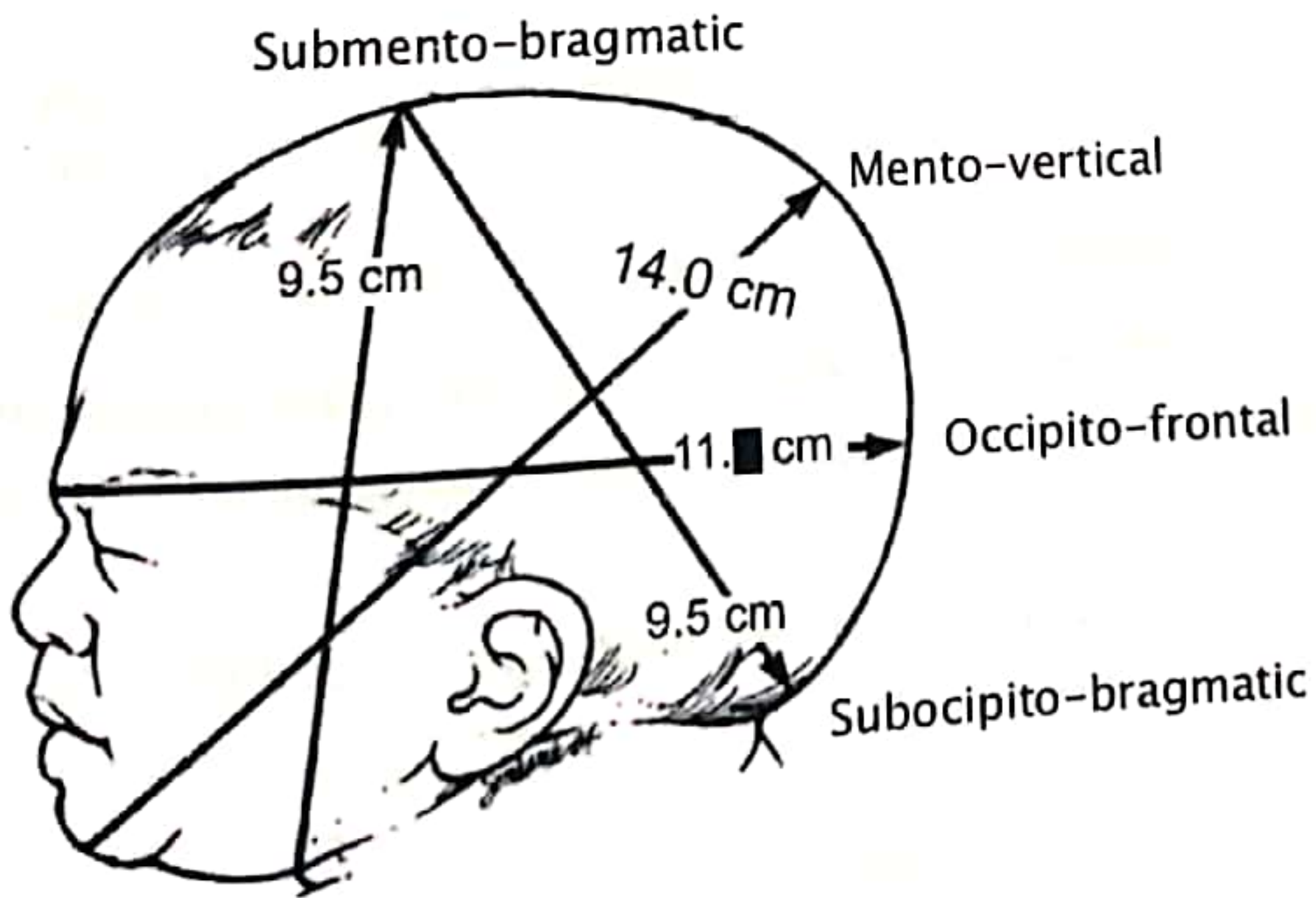
Foetal skull showing bones, sutures and fontanelles

The above figure shows anterior fontanelle, posterior fontanelle, sagittal suture and coronal sutures and lambdoidal suture, both parietal, both frontal bones, and occipital bones. All these can be recognized by touch during per vaginal examination of a woman in labour.

The girdle of contact is that circumference of the foetal head, which comes in contact with the pelvic brim. It varies with the degree of flexion or extension, i.e. diameter of engagement.

The antero-posterior diameters of the foetal head :

Diameters	Description	Presentation
Sub-occipito-bregmatic diameter (9.5 cm)	From below the occiput to centre of bregma	Occipito anterior position of vertex
Sub-occipito-frontal diameter (10 cm)	From below the occiput to anterior angle of bregma	Occipito posterior position of vertex depending on deflexion of head
Occipito-frontal diameter (11.5 cm)	From Occipital protuberance to the root of nose	
Mento-vertical diameter (14 cm)	From point of chin to the highest point on vertex in the sagittal suture	Brow presentation
Sub-mento-vertical diameter (11.5 cm)	Point between neck and chin to the centre of sagittal suture	Glabella Presentation (Between face and brow)
Sub-mento-bregmatic diameter (9.5 cm)	From the point between neck and chin to the centre of the bregma	Face Presentation



Diameters of foetal skull

The transverse diameters of the foetal head :

Diameters	Diamention	Discription
Bi-parietal diameter	9.5 cm	Between two parietal eminences
Bi-temporal diameter	8 cm	Between antero-inferior ends of the coronal sutures
Super-subparietal diameter	8.5 cm	Extends from a point below one parietal eminence to a point above the other parietal eminence of the opposite side
Bi-mastoid diameter	7.5 cm	Between the tip of two mastoid processes

Moulding

Change in the shape of the forecoming head is due to movement of skull bones at sutures. Usually, the margins of the occipital bones are pushed under the parietal bones showing overlapping of bones at the lambdoid and sagittal sutures. Rarely, frontal bone may move under parietal bones. In many cases, one parietal bone may overlap another. This is known as moulding. It is physiological to certain extent i.e. "0" and "+". It is harmful, if it is severe, i.e. "++" or "+++". Moulding decreases the bi-parietal diameter and sub-occipito-bregmatic diameter.

Caput succedaneum

During labour, head undergoes changes in the shape as a result of the pressure to which it is subjected during labour. Lower most part of the head may get oedematus due to pressure of the rigid perineum on the venous circulation. This swelling on the parietal bone is known as caput succedaneum, it disappears after birth within 24 hours.

Teratogens and their Effects on Foetus

A teratogen is an agent that can disturb the development of the embryo or foetus. Teratogens halt the pregnancy or produce a congenital malformation (a birth defect).

Teratology is the study of abnormal development in embryos and the causes of congenital malformations or birth defects. These anatomical or structural abnormalities are present at birth although they may not be diagnosed until later in life. They may be visible on the surface of the body or internal to the viscera. Congenital malformations account for approximately 20% of deaths in the perinatal period. Approximately 3% of newborn

infants will have major malformations and another 3% will have malformations detected later in life.

Causes of congenital malformations including :

- 1) Genetic factors (chromosomal abnormalities as well as single gene defects);
- 2) Environmental factors (drugs, toxins, infectious cause, mechanical forces)
- 3) Multifactorial cause

Malformations may be single or multiple and have major or minor clinical significance. Single minor malformations are observed in approximately 14% of newborns. These malformations are usually of no clinical consequence and may include features such as a simian crease or ear tags. Specific minor malformations suggest the possibility of an associated major malformation. For instance, the finding of a single umbilical artery should suggest the possibility of associated congenital heart problems.

Genetical cause of malformations

Genetic factors are the most common causes of congenital malformations and account for approximately one fourth of all congenital malformations. Chromosomal abnormalities including numerical and structural abnormalities are a common cause of congenital malformations.

Chromosomal abnormality/aberration/mutation

It is a missing, extra, or irregular portion of chromosomal DNA.

It can be from an atypical number of chromosomes or a structural abnormality in one or more chromosomes.

They can be organized into two basic groups :

1. Numerical anomalies
2. Structural anomalies

Numerical anomalies: Alterations in chromosome number

1. **Trisomic:** cell has one extra chromosome ($2n + 1$)

example:

- Trisomy 21- Down's syndrome,
- Trisomy 18- Edward's syndrome,
- Trisomy 13- Patau's syndrome,
- Trisomy 47 -Klinefelter's syndrome .

2. **Monosomic:** cell has one missing chromosome ($2n - 1$) = usually lethal,
eg. Monosomy 45 - Turner's syndrome (XO).

Structural anomalies

When the chromosome's structure is altered, this can take several forms:

1. Deletions:

- Cri du chat (cry of the cat) : A specific deletion of a small portion of chromosome 5; these children have severe mental retardation, a small head with unusual facial features, and a cry that sounds like a distressed cat.
- Wolf-Hirschhorn syndrome (partial deletion of the short arm of chromosome 4),
- Jacobsen syndrome, also called the terminal 11q deletion disorder.

2. Duplications:

- Charcot-Marie-Tooth disease type 1A, on chromosome 17.

3. Translocations : Robertsonian translocation: chromosomes 13, 14, 15, 21, and 22.

4. Inversions

5. Insertions

6. Rings

7. Isochromosome

Down syndrome

- Trisomy of 21 ($47, 21+$), the result of an extra copy of chromosome 21.
- Down syndrome affects 1:700 children and alters the child's phenotype either moderately or severely:
 - a. Characteristic facial features, short stature, heart defects
 - b. Susceptibility to respiratory disease, shorter lifespan
 - c. Prone to developing early Alzheimer's and leukemia
 - d. Often sexually underdeveloped and sterile, usually some degree of mental retardation.
 - e. Down Syndrome is correlated with age of mother but can also be the result of non-disjunction of the father's chromosome 21.

Patau syndrome

- Trisomy of 13.
- Cleft lip and cleft palate, central nervous system malformations, microphthalmia, and congenital heart disease. Infants with this disorder rarely live beyond the first year of

life. (1:5000 live births). Children rarely live more than a few months.

Edward's syndrome

- Trisomy of 18.
- Intrauterine growth restriction, clenched hands, rocker bottom feet, and congenital heart disease and almost every organ system affected 1:10,000 live births. Children with full Trisomy 18 generally do not live more than a few months.

Klinefelter syndrome

- 47, XXY males.
- Male sex organs; unusually small testes, sterile, breast enlargement and other feminine body characteristics and normal intelligence.

Trisomy X

- 47, XXX females.
- 1:1000 live births - healthy and fertile - usually cannot be distinguished from normal female except by karyotype

Monosomy X (Turner's syndrome)

- 1:5000 live births; the only viable monosomy in humans - women with Turner's have only 45 chromosomes XO individuals are genetically female, however, they do not mature sexually during puberty and are sterile. Primary amenorrhoea, webbing of the neck, lymphoedema of the hands and feet, and later in life short stature and infertility (98% of these foetuses die before birth).

Teratogenic Agent

A teratogenic agent is a chemical, infectious agent, physical condition, or deficiency that, on foetal exposure, can alter foetal morphology or subsequent function. Teratogenicity depends upon the ability of the agent to cross the placenta. Certain medications such as heparin cannot cross the placenta due to its high molecular weight and are therefore not teratogenic. The embryo is most susceptible to teratogenic agents during periods of rapid differentiation. The stage of development of the embryo determines susceptibility to teratogens. The most critical period in the development of an embryo or in the growth of a particular organ is during the time of most rapid cell division. For instance, the critical period for brain growth and development is from 3 to 16 weeks. However the brain's differentiation continues to extend into infancy. Teratogens can produce mental retardation during both embryonic and foetal periods.

Effect of Teratogen during gestational age

Tissue	Malformation	Defect	Timing	Information
Central nervous system	Holoprosencephaly	Prechordal mesoderm	23 days	Associated facial defects
	Anencephaly	Closure of anterior neural tube	26 days	subsequent degeneration of forebrain
	Meningomyelocele	Closure in portion of posterior neural tube	28 days	80% lumbosacral
Face	Cleft lip	Closure of lip	36 days	42% associated with cleft palate
	Branchial sinus or cyst	Resolution of branchial cleft	8 weeks	Preauricular and along line anterior to sternocleidomastoid
	Robin sequence	Early mandibular hypoplasia	9 weeks	U-shaped posterior cleft palate
	Cleft maxillary plate	Fusion of maxillary palatal shelves	10 weeks	
Neck	Esophageal atresia and tracheoesophageal fistula	Lateral septation of foregut into trachea and foregut	30 days	
	Posterior nuchal cystic hygroma	Lymphaticovenous communication	40 days	Common in XO Turner's syndrome
Abdomen	Rectal atresia with fistula	Lateral septation of cloaca into rectum and urogenital sinus	6 weeks	
	Diaphragmatic hernia	Closure of pleuroperitoneal canal	6 weeks	
	Duodenal atresia	Recanalization of duodenum	7-8 weeks	
	Malrotation of gut	Rotation of intestinal loop so that cecum lies to right	10 weeks	Associated incomplete or aberrant mesenteric attachments
	Omphalocele	Return of midgut from form yolk sac to abdomen	10 weeks	
	Meckel diverticulum	Obliteration of vitelline duct	10 weeks	May contain gastric or pancreatic tissue

Genitourinary system	Extroversion of bladder	Migration of infraumbilical mesenchyme	30 days	Associated mullerian and wolffian duct defects
	Urethral obstruction sequence	Usually poststatic urethra valves	9 weeks	More common in males
	Bicornuate uterus	Fision of lower portion of mullerian ducts	10 weeks	
	Hypospadias	Fusion of urethral folds (labia minora)	12 weeks	
	Cryptorchidism	Non-descent of testicle into scrotum	7-9 months	
Heart	D-transposition of great vessels	Directional development of bulbus cordis septum	34 days	
	Ventricular septal defect	Closure of ventricular septum	6 weeks	
	Patent ducts arteriosus	Closure of ductus arteriosus	9-10 months	
Limb	Aplasia of radius	Genesis of radial bone	3days	Often accompanied by other defects of radial side of distal limb
	Severe syndactyly	Separation of digital rays	6 weeks	

Less than 2% of congenital malformations are caused by drugs or chemicals. There are small numbers of drugs that have been positively implicated as teratogenic agents that should be avoided either during or prior to conception. However, because of the unknown, subtle effects of many agents, women preparing to conceive or already pregnant refrain from taking any medications that are not absolutely necessary. Women are especially urged to avoid using all medications during the first 8 weeks after conception unless there is a strong medical reason. Effects of teratogens during this period of developmental often times results in an "all or none effect." That is, the effect of the teratogen, if it is to have any effect, will be so profound as to cause a spontaneous abortion.

Some examples of teratogens known to cause human malformations are listed in the table belows.

Congenital Malformations

Treatogens	Congenital Malformations
Androgenic Agents Ethisterone Norethisterone Testosterone	Varying degrees of masculinization of female foetuses : ambiguous external genitalia caused by labial fusion and clitoral hypertrophy.
Drugs and Chemicals Alcohol	Foetal alcohol syndrome : intrauterine growth retardation (IUGR), mental retardation, microcephaly, ocular anomalies, joint abnormalities, short palpebral fissures.
Aminopterin	Wide range of skeletal defects, IUGR, malformation of the central nervous system, notably meroanencephaly (a large part of the brain is absent)
Busulfan	Stunted growth, skeletal abnormalities, corneal opacities, cleft palate, hypoplasia of various organs.
Phenytoin (Dilantin)	Foetal hydantoin syndrome : IUGR, microcephaly, mental retardation, ridged metopic suture, inner epicanthal folds, eyelid ptosis; broad depressed nasal bridge; phalangeal hypoplasia.
Lithium carbonate	Various malformations, usually involving the heart and great vessels.
Methotrexate	Multiple malformations, especially skeletal, involving the face, skull, limbs and vertebral column.
Large doses of retinoic (vitamin A)	Facial abnormalities, neural tube defects, such as spina bifida cystica.
Tetracycline	Stained teeth, hypoplasia of enamel, diminished growth of long bones
Trimethadiones	Developmental delay, V-shaped eyebrow, low-set ears, cleft lip and or palate.
Nicotine	Premature delivery.
Thalidomide	Thalidomide syndrome or meromelia (include limb abnormalities that span from absence of the limbs to rudimentary limbs to abnormally shortened limbs).
Anti-neoplastic or chemotherapeutic agents	Inhibit rapidly dividing cells.

Infectious Agents	
Cytomegalovirus	Microcephaly, hydrocephaly, microphthalmia, microgyria, micromelia, mental retraction, cerebral calcifications, hepatosplenomegaly, IUGR.
Herpes simplex virus Rubella virus	Microcephaly; microphthalmia, retinal dysplasia. Cataracts, glaucoma, chorioretinitis, deafness, microphthalmia, congenital heart defects.
Varicella Toxoplasma gondii	Skin scarring, muscle atrophy, mental retardation. Microcephaly, mental retardation, microphthalmia, hydrocephaly, chorioretinitis, cerebral calcifications.
Treponema pallidum	Hydrocephalus, congenital deafness, mental retardation abnormal teeth and bone
High levels of ionizing radiation	Microcephaly, mental retardation, skeletal malformations.

Radiation as teratogen

Ionizing radiation can injure the developing embryo due to cell death or chromosome injury. The severity of damage to the embryo depends on the dose absorbed and the stage of development at which the exposure occurs. Study of survivors of the Japanese atomic bombing demonstrated that exposure at 10 to 18 weeks of pregnancy is a period of greatest sensitivity for the developing brain. There is no proof that human congenital malformations have been caused by diagnostic levels of radiation. However, attempts are made to minimize scattered radiation from diagnostic procedures such as x-rays that are not near the uterus. The standard dose of radiation associated with a diagnostic x-ray produces a minuscule risk to the foetus. However, all women of childbearing age are asked if they are pregnant before any exposure to radiation.

Others Teratogens

Maternal medical conditions can also produce teratogenic risks. Infants of diabetic mothers have an increased incidence of congenital heart disease, renal, gastrointestinal, and central nervous system malformations such as neural tube defects. Tight glycemic control during the third to sixth week post-conception is critical. Infants of mothers with phenylketonuria who are not well controlled and have high levels of phenylalanine have a significant risk of mental retardation, low birth weight, and congenital heart disease.

Mechanical forces can also act as teratogens. Malformations of the uterus may restrict foetal movements and associated with congenital dislocation of the hip and clubfoot. Oligohydramnios can have similar results and mechanically induce abnormalities

of the foetal limbs. These abnormalities would be classified as deformations or abnormal forms, shapes, or positions of body parts caused by physical constraints. Amniotic bands are fibrous rings and cause intrauterine amputations or malformations of the limbs as well. These abnormalities would be classified as disruptions or defects from interference with a normally developing organ system usually occurring later in gestation.

Most common congenital malformations have familial distributions consistent with multifactorial inheritance. Multifactorial inheritance may be presented by a model in which liability to a disorder is a continuous variable that is dependent on a combination of environmental and genetic factors. Development of the malformation is dependent upon passing a threshold that is the sum of a combination of many of these factors. Traits that demonstrate this mode of inheritance include cleft lip, cleft palate, neural tube defects, pyloric stenosis, and congenital dislocation of the hip.

गर्भिणी की निरुक्ति

गर्भिणी गर्भवति इति । (श.कल्प द्रुम)

स्त्री गर्भोऽस्ति अस्याम् इति । (श.कल्प द्रुम)

गर्भोस्त्यास्या दूनि । (श.स्तो.म.)

अर्थात् जो स्त्री गर्भ का वहन करे उसे गर्भिणी कहते हैं।

गर्भिणी लक्षण

सद्योगृहीत गर्भा के लक्षण

स्त्री में शुक्र एवं आर्तव के संयोग के तुरन्त बाद जो लक्षण उत्पन्न होते हैं उन्हे ही सद्योगृहीत गर्भा के लक्षण जानने चाहिए ।

निष्ठीविका गौरवमङ्गसादस्तन्द्राप्रहर्षो हृदये व्यथा च ।

तृप्तिश्च बीजग्रहणं च योन्यां गर्भस्य सद्योऽनुगतस्य लिङ्गम् ॥

(च.सं.शा. 2/23)

तत्र सद्यो गृहीतगर्भाया लिङ्गानि—श्रमो ग्लानिः पिपासा सक्थिसदनं शुक्रशोणितयोरवबन्धः स्फुरणञ्च योनेः ॥ (सु.सं.शा. 3/11)

अथ नार्याः सद्योगृहीतगर्भायाश्च लिङ्गं योन्या बीजग्रहणं तृप्तिर्गर्भमा स्फुरणं शुक्रार्तवयोरननुबन्धञ्च। तथा प्रहर्षो हल्लासस्तन्द्राऽङ्गसादः प्रसेको हृदयव्यथा ग्लानिः पिपासा च । (अ.सं.शा. 2/8)

लिङ्गं तु सद्योगर्भाया योन्या बीजस्य सङ्ग्रहः ॥

तृप्तिर्गुरुत्वं स्फुरणं शुक्रास्त्राऽननुबन्धनम् ।

हृदयस्पन्दनं तन्द्रा तृङ्ग्लानिलोमहर्षणम् ॥

(अ.ह.शा. 1/35-36)

आचार्य चरक	आचार्य सुश्रुत	आचार्य वृद्धवाग्भट	आचार्य वाग्भट
बार-बार थूक आना	थकावट	योनि में बीज का ग्रहण	योनि में बीज का ग्रहण
शरीर में भारीपन	निष्क्रियता	तृप्ति	तृप्ति
अंगों में अवसाद (शिथिलता)	तृष्णा	भारीपन	भारीपन
तन्द्रा	पैरों में शिथिलता	योनिस्फुरण	शुक्र-आर्तव की

प्रहर्ष हृदय प्रदेश में वेदना तृप्ति योनि द्वारा स्त्रीबीज और शुक्र का ग्रहण	शुक्र-शोणित की रुकावट योनिस्फुरण	शुक्र-शोणित की रुकावट प्रहर्ष हल्लास तन्द्रा अंगों में शिथिलता प्रसेक हृदय प्रदेश में पीड़ा ग्लानि तृष्णा	अप्रवृत्ति हृदय स्पन्दन तन्द्रा प्यास ग्लानि लोमहर्ष
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आचार्य भावमिश्र ने भी आचार्य सुश्रुत के अनुरूप ही लिखा है।

व्यक्तगर्भा के लक्षण

जो लक्षण स्त्री में गर्भ के व्यक्त होने अर्थात् तृतीय मास तक उत्पन्न होते हैं उसे व्यक्तगर्भा के लक्षण कहते हैं। आचार्य चरक ने “व्यक्तगर्भा” शब्द का प्रयोग नहीं किया है बल्कि गर्भ-प्राप्ति और द्वैहृदय्य के विशेष ज्ञान के लिए गर्भिणी के लक्षणों का वर्णन किया है।

.....तद्यथा-आर्तवादर्शनमास्यसंस्त्रवणमनत्राभिलाषच्छर्दिरोचकोऽम्लकामता च विशेषेण श्रद्धाप्रणयनमुच्चावचेषु भावेषु गुरुगात्रत्वं चक्षुषोग्लानिः स्तनयोः स्तन्यमोष्ठयोः स्तनमण्डलयोश्च काष्ण्यमत्यर्थं श्वयथुः पादयोरीषल्लोमराज्युद्गमो योन्याश्चाटालत्वमिति गर्भे पर्यागते रूपाणि भवन्ति। (च.सं.शा. 4/16)

आर्तव का न दिखाई देना, मुख से बार-बार पानी का आना, अन्न खाने की इच्छा न होना, वमन, अरुचि, विशेष रूप से अम्ल पदार्थ खाने की इच्छा, उत्तम और अवर भावों में श्रद्धा का होना, शरीर में भारीपन, आँखों में ग्लानि, स्तन से दूध का निकलना, दोनों ओष्ठ और दोनों स्तन मण्डल में अधिक कालिमा होना, पाँवों में कुछ शोथ होना, उदर में रोमराजि उत्पन्न होना और योनि (अपत्यपथ) का अधिक विस्तार युक्त होना। गर्भ के स्थापित होने पर ये सभी लक्षण उत्पन्न होते हैं।

आचार्य चक्रपाणि के अनुसार यही लक्षण गर्भ स्थापित होने के तीसरे महीने में द्वैहृदया के भी जानना चाहिए।

आचार्य सुश्रुत ने भी व्यक्तगर्भा शब्द का प्रयोग न कर सघोगृहीत गर्भा के लक्षण के पश्चात् गर्भिणी के लक्षणों का वर्णन किया है जो इस प्रकार हैं—

स्तनयोः कृष्णमुखता रोमराज्युद्गमस्तथा ।
अक्षिपक्ष्माणि चाप्यस्या संमील्यन्ते विशेषतः॥
अकामतश्छर्दयति गन्धादुद्विजते शुभात् ।

प्रसेकः सदनं चापि गर्भिण्या लिङ्गमुच्यते ॥

(सु.स.शा. 3/12)

स्तनों के मुख में कालापन तथा रोमराजी की उत्पत्ति, आँखों के बाल का विशेषकर मिलना (अर्थात् पलकों का बार-बार बन्द हो जाना), बिना कारण वमन, शुभ-गन्धों से भी त्रस्त, मुख से लालास्राव एवं थकावट आदि गर्भिणी के लक्षण होते हैं।

भावमिश्र ने भी सुश्रुतानुसार ही वर्णन किया है।

आचार्य वाग्भट ने व्यक्तगर्भा का नामतः वर्णन करते हुए निम्नलिखित लक्षणों को बताया है—

क्रमेण तु व्यक्तगर्भायाः कुक्षिमात्रगौरवं क्षामनेत्रस्वरताऽक्षिरोमसंलुलन निद्रा जृम्भणं मूर्च्छा छर्दिररुचिः
पादशोफोऽम्लेऽभिलाषस्तेषु तेषु चोच्चावचेषु भावेष्विति ॥

.....पीनकपोलपयोधरता कृष्णौष्ठ चूचुकत्वं च ॥

यथा यथा च गर्भो वृद्धिमाप्नोति तथा तथा भाराहार सापचाराच्च स्त्रिया बलक्षयः ॥

(अ.सं.शा. 2/9,11,59)

—तत्र	व्यक्तस्य	लक्षणम् ।
क्षामता	गरिमा	कुक्षेमूर्च्छाच्छर्दिररोचकः ॥
जृम्भा	प्रसेकः सदनं	रोमराज्याः प्रकाशनम् ।
अम्लेष्टता	स्तनौ पीनौ	सस्तन्यौ कृष्णचूचुकौ ॥
पादशोफो	विदाहोऽत्रे	श्रद्धाश्च विविधात्मिकाः ।

(अ.ह.शा. 1/50-52)

अष्टाङ्ग संग्रह के अनुसार कुक्षि में भारीपन, शरीर में भारीपन, आँखों में कृशता, स्वर की कृशता, अक्षि के रोम की अस्तव्यस्तता, निद्रा, जृम्भा, मूर्च्छा, छर्दि, अरुचि, पादशोफ, अम्ल भोजन की आकांक्षा एवं उच्च-नीच भावों की आकांक्षा, कपोल और स्तन में भारीपन तथा ओष्ठ एवं स्तन चूचुक कृष्णवर्ण का होना क्रमशः व्यक्तगर्भा के लक्षण हैं।

जैसे-जैसे गर्भ बढ़ता जाता है वैसे-वैसे गर्भ का भार उठाने के कारण तथा शरीर के पोषक आहार रस के गर्भ में चले जाने से स्त्री का बलक्षय होता है।

अष्टांगहृदयानुसार कृशता, उदर में भारीपन, मूर्च्छा, वमन, अरोचक, जम्भाई, मुख से लालास्राव, शिथिलता, रोमराजि का उत्पन्न होना, अम्ल अन्न में रुचि, स्तनों की पुष्टि, स्तनों में दुध आना, स्तन चूचुकों का कृष्णवर्ण होना, पैरों में शोफ, अन्न का विदाह तथा नाना प्रकार की पथ्य-अपथ्य सम्बन्धी श्रद्धा होना व्यक्तावस्था के लक्षण हैं।

गर्भिणी के मासानुमासिक लक्षण

आचार्य चरक एवं काश्यप ने चतुर्थ से सप्तम मास में गर्भ वृद्धि के साथ-साथ होने वाले गर्भिणी के विशिष्ट लक्षणों का भी वर्णन किया है। जो इस प्रकार हैं—

चतुर्थे मासि स्थिरत्वमापद्यते गर्भः, तस्मात्तदा गर्भिणी गुरुगात्रत्वमधिकमापद्यते विशेषेण ॥

पञ्चमे मासि गर्भस्य मांसशोणितोपचयो भवत्यधिकमन्येभ्यो मासेभ्यः, तस्मात्तदा गर्भिणी काश्यमापद्यते विशेषेण ॥

षष्ठे मासि गर्भस्य बलवर्णोपचयो भवत्यधिकमन्येभ्यो मासेभ्यः, तस्मात्तदा गर्भिणी बलवर्णहानिमापद्यते विशेषेण ॥

सप्तमे मासि गर्भः सर्वैर्भावैराप्याध्यते, तस्मात्तदा गर्भिणी सर्वाकारैः क्लान्ततमा भवति ॥

(च.सं.शा. 4/20-23)

माह	आचार्य चरक	आचार्य काश्यप
चतुर्थ	शरीर में विशेष गुरुता	गुरुगात्रता
पंचम	गर्भिणी विशेषतः कृश	कृशता
षष्ठम	बल-वर्ण की विशेष हानि	अधिक श्रम
सप्तम	सभी प्रकार से क्लान्ततम	क्लान्ततम

गर्भ के लिङ्ग-निर्णायक गर्भिणी लक्षण

सव्याङ्गचेष्टा पुरुषार्थिनी स्त्री स्त्रीस्वप्नपानाशशील चेष्टा ।

सव्यात्तगर्भा न च वृत्तगर्भा सव्यप्रदुग्धा स्त्रियमेव सूते ॥

पुत्रं त्वतो लिङ्गविपर्ययेण व्यामिश्रलिङ्गा प्रकृतिं तृतीयाम् ।

(च.सं.शा. 4/24-25)

जो स्त्री सभी चेष्टायें वाम भाग से करती है, जो मैथुन हेतु पुरुष की इच्छा करती है, जो स्वप्न में स्त्री या स्त्री-लिङ्ग पदार्थों को प्राप्त करती है, जो स्त्री-लिङ्ग खाद्य और पेय पदार्थों में अधिक इच्छा रखती है, जो स्त्रियों की तरह स्वभाव और अन्य चेष्टा करती है, जिस स्त्री के वाम भाग में गर्भ के रहने से वाम कुक्षि में उभार प्रतीत होता है, जो गोलाकृति का न हो (उदर गोलाई में न बढ़ा हो), वामस्तन से प्रथम दुग्ध उत्पन्न हो तो वह स्त्री निश्चित रूप से कन्या को ही प्रसव करती है। इसके विपरीत लक्षण होने पर पुत्र तथा दोनों के मिश्रित लक्षण होने पर नपुंसक का प्रसव करती है।

तत्र यस्या दक्षिणे स्तने प्राक् पयोदर्शनं भवति, दक्षिणाक्षिमहत्त्वं च, पूर्वं च सक्थ्युत्कर्षति, बाहुल्याच्च पुत्रामध्येषु द्रव्येषु दौर्हदमभिध्यायति, स्वप्नेषु चोपलभते पद्मोत्पलकुमुदाम्रातकादीनि पुत्रामान्येव, प्रसन्नमुखवर्णा च भवति तां ब्रूयात् पुत्रमियं जनयिष्यतीति, तद्विपर्यये कन्याम्, यस्याः पार्श्वद्वयमवनतं पुरस्तात्त्रिर्गतमुदरं प्रागभिहितलक्षणं च तस्या नपुंसकमिति विद्यात् ।

(सु.सं.शा. 3/32)

जिस स्त्री के दक्षिण स्तन में प्रथम दुग्ध दिखाई दे, दक्षिण नेत्र बड़ी हो, दाहिने पैर को प्रथम उठाकर चलती हो,

विशेषकर पुरुषवाचक पदार्थों में दौहद हो, स्वप्न में कमल, उत्पल, कुमुद, आम्रातक आदि पुरुषवाचक पुष्प का दर्शन करती हो, मुख और वर्ण प्रसन्न हो, वह पुत्र जन्म देगी इसके विपरीत होने पर कन्या उत्पन्न करेगी।

जिसके कुक्षि के दोनों पार्श्व अवनत (नीचे की ओर) हो तथा उदर आगे की ओर निकला हुआ और पूर्वकथित दोनों प्रकार के लक्षण हो तो नपुंसक गर्भ समझना चाहिए।

टीकाकार डल्हण ने रोमराजि का ऊर्ध्व होना भी पुत्रोत्पत्ति का लक्षण माना है।

तत्र या दक्षिणं पाद पूर्णमभिहरीत.....परिमण्डलगर्भा.....तीक्ष्णक्षुर्ध्व रोमराजिः पुरुषानाभिलाषिणी.....नपुंसकम् । प्रश्नकाले नारी यल्लिङ्गमङ्ग बाह्यद्रव्यं वा परामृशति तल्लिङ्गमस्या गर्भमादिशेत् ॥ (अ.सं.शा. 2/36)

गर्भावस्था में जो स्त्री प्रथम दक्षिण पैर को उठाकर चलती हो, जिसकी दक्षिण बाहु पहले की अपेक्षा बलवान् हो, दक्षिणबाहु से ही चेष्टा करती हो, सर्वप्रथम दक्षिण स्तन में दूध आये, दक्षिण तरफ का पेट अधिक भारी या उठा हुआ हो, गर्भ गोलाकार हो (लम्बा न हो), दौहद के समय देखने-स्पर्श करने तथा प्रश्न में पुलिङ्ग नाम वाले पदार्थों की अभिलाषा हो, मुख का वर्ण निर्मल हो, भूख की प्रबलता हो, नाभि से नीचे रोमराजी ऊपर की ओर मुख किए हो और पुरुषों की अभिलाषा नहीं करने वाली स्त्री पुत्र को उत्पन्न करती है। इससे विपरीत लक्षणों वाली स्त्री कन्या को उत्पन्न करती है। दोनों लक्षण मिश्रित होने पर नपुंसक को उत्पन्न करती है। प्रश्न करने पर स्त्री जिस लिंग वाले बाह्य द्रव्य या अन्न को स्पर्श करती है वह उसी लिङ्ग के गर्भ वाली होती है।

प्राग्दक्षिणस्तनस्तन्या पूर्वं तत्पार्श्वचेष्टिनी ॥
पुत्रामदौहदप्रश्नरता पुंस्वप्नदर्शिनी ।
उन्नते दक्षिणे कुक्षौ गर्भे च परिमण्डले ॥
पुत्रं सूतेऽन्यथा कन्यां या चेच्छति नृसङ्गतिम् ।
नृत्यवादित्रगान्धर्वगन्धमाल्यप्रिया च या ॥
क्लीबं तत्सङ्करे तत्र मध्यं कुक्षेः समुन्नतम् ।

(अ. ह.शा. 1/69-72)

अष्टांगहृदयाकार ने पुत्र गर्भ के लक्षणों के साथ-साथ कन्या गर्भ के लक्षणों में बताया है। पुत्र गर्भ के विपरीत लक्षण वाली तथा जो स्त्री पुरुष आकांक्षिणी हो, नृत्य, वादन, गायन, गन्ध एवं मालाओं में रुचि रखती हो वह कन्या ही जन्म देगी। दोनों प्रकार के मिश्रित लक्षण होने पर तथा कुक्षि मध्यभाग में उन्नत होने पर नपुंसक जन्म देगी।

आचार्य भेल एवं भावमिश्र ने भी इसी प्रकार से वर्णन किया है।

आचार्य काश्यप ने लक्षणाध्याय में योनि के आकृति के अनुसार गर्भलिङ्ग का वर्णन किया है—

मध्य में निबिड योनि → कन्या जन्म
उन्नत रमणीय मांसल योनि → पुत्र जन्म

युग्म गर्भ में गर्भिणी लक्षण

यस्या मध्ये निम्नं द्रोणीभूतमुदरं सा युग्मं प्रसूयत इति ॥ (सु.सं.शा. 3/32)

यमौ पार्श्वद्वयोन्नामाकुक्षौ द्रोण्यामिव स्थिते ॥ (अ.ह.शा. 1/72)

- जिसका कुक्षि मध्य में निम्न द्रोणी सदृश हो वह युग्म प्रसव करेगी।
- टीकाकार डल्हण ने रोमराजी का निम्न होना भी युग्म गर्भ का लक्षण माना है।
- कुक्षि के दोनों पार्श्व उन्नत होने पर, जिससे उदर नौका की आकृति का हो जाता है तो युग्म सन्तान उत्पन्न होती है।

गर्भिणी में उत्पन्न स्तन परिवर्तन के कारण

शेषं चोर्ध्वतरमागतं पयोधरावभिप्रतिपद्यते, तस्माद्गर्भिण्यः पीनोन्नतपयोधरा भवन्ति ॥ (सु.सं.शा. 4/24)

जरायुशेषं चोर्ध्वमसृक् प्रतिपद्यते । तस्मात्पीनकपोलपयोधरता कृष्णौष्ठचुचुक्त्वं च । (अ.सं.शा. 2/11)

शेष रक्त (रुके हुए आर्तव से अपरा निर्माण के बाद) ऊपर जाकर स्तनों को प्राप्त होता है जिसके फलस्वरूप गर्भिणी के स्तन पीन (स्थूल या पुष्ट) तथा उन्नत हो जाते हैं। वृद्ध वाग्भट के अनुसार, जरायु बनने से बचा रक्त उपर की ओर जाता है, इसी कारण गर्भवती के कपोल और स्तन भारी हो जाते हैं एवं ओष्ठ और चूचुक काले पड़ जाते हैं। टीकाकार डल्हण ने भी वृद्ध वाग्भट के अनुसार स्तन एवं कपोल पीन तथा ओष्ठ और चूचुक कृष्ण होना बताया है।

पुंसवन कर्म

पुंसवनमिति पुंस्त्वकारकं कर्म ॥ (चक्र., च.सं.शा. 8/19)

इच्छित् पुमान् सन्तान उत्पन्न करने वाले कर्म को पुंसवन कर्म कहते हैं।

पुंसवनकर्म हेतु उपयुक्त काल

तयोः कर्मणा वेदोक्तेन विवर्तनमुपदिश्यते प्राग्व्यक्तीभावात् प्रयुक्तेन सम्यक् । कर्मणां हि देशकालसंपदुद्येतानां नियतमिष्टफलत्वं, तथेतरेषामितरत्वम् । तस्मादापन्नगर्भा स्त्रियमभिसमीक्ष्य प्राग्व्यक्तीभावाद्गर्भस्य पुंसवनमस्यै दद्यात् । (च.सं.शा. 8/19)

लब्धगर्भायाश्चैतेषु.....। (सु.सं.शा. 2/34)

लब्धगर्भा चैनां विदित्वा प्राग्व्यक्तीभावाद्गर्भस्य पुष्ये पुंसवनादि प्रयुञ्जीत। द्वादशरात्रमित्यन्ते। तत्रापि युग्मदिनेष्विति केचित् । (अ.सं. 1/60-61)

गर्भः पुंसवनान्यत्र पूर्वं व्यक्तेः प्रयोज्येत् ।
बली पुरुषकारो हि दैवमध्यतिवर्तते ॥

(अ.ह.शा. 1/37-38)

आयुर्वेद में बताए हुए कार्यों के सद्नुष्ठान द्वारा तब तक परिवर्तन किया जा सकता है, जब तक कि गर्भ में स्त्रीलिङ्ग, पुलिङ्ग एवं नपुसंक लिङ्ग की अभिव्यक्ति नहीं हो जाती। देश-काल की अनुकूलता होने पर पुंसवन कर्म के समुचित प्रयोग करने पर अभीष्ट फल की प्राप्ति होती है और यदि अनुचित देश एवं अनुचित समय पर किया जाये तो अनिष्ट फल की प्राप्ति होती है। इसीलिए स्त्री को गर्भवती जानकर व्यक्ति भाव के पूर्व पुंसवन का प्रयोग कराया जाता है। टीकाकार चक्रपाणि ने व्यक्तिभाव के पूर्व का काल द्वितीय मास तक मानकर इसी काल तक पुंसवन करने का विधान बताया है।

आचार्य सुश्रुत ने केवल लब्धगर्भा (अर्थात् जब गर्भ रह जाए) कहा है।

आचार्य डल्हण ने इस पर टीका करते हुए नस्य आदि प्रयोग का तीन काल, तीन विभिन्न प्रयोजनों हेतु बताया है :

1. गर्भ उपलब्धि के पूर्व— गर्भ ग्रहण हेतु
2. लब्धगर्भा होने पर— गर्भ स्थापन हेतु
3. स्थित गर्भ में तीन मास के पूर्व— पुत्र सन्तानोत्पत्ति हेतु

आचार्य वृद्ध वाग्भट ने स्त्री को गर्भधृति के लक्षण देखने पर व्यक्तिभाव होने के पूर्व पुष्य नक्षत्र में पुंसवन कर्म का प्रयोग बताया है। साथ ही तीन अन्य मतों का भी प्रतिपादन किया- प्रथम बारह दिन तक; द्वितीय बारह दिनों में भी केवल युग्म दिनों में; तृतीय प्रतिदिन पुंसवन विधि का प्रयोग करना चाहिए।

आचार्य इन्दु ने भी 4 काल बताया है— प्रथम दिन, युग्म दिनों में, प्रत्येक दिन एवं बारह दिनों के युग्म दिन में पुंसवन का प्रयोग करना चाहिए।

अष्टांगहृदयकार ने गर्भ के मासानुमासिक वृद्धि क्रम के अन्तर्गत प्रथम मास गर्भ अव्यक्त रहता है एवं इसमें व्यक्त भाव आने के पूर्व ही पुंसवन का विधान किया है क्योंकि बलवान् पुरुषाकार (पुंसवन कर्म) दैव (भाग्य) को भी परिवर्तित कर देता है।

इस प्रकार पुंसवन कर्म हेतु काल—

चरक - प्राग्व्यक्तीभावा, आपन्न गर्भा

चक्र. - 2 मास तक

सुश्रुत - लब्धगर्भा

डल्हण - गर्भोत्पत्ति के पूर्व, लब्धगर्भा, 3 मास के पूर्व

अ.सं. - लब्धगर्भा, प्राग्व्यक्तीभावा, अन्य मत से 12 दिन, युग्म दिन, प्रतिदिन

इन्दु - प्रथम दिन, युग्म दिन, प्रत्येक दिन, 12 दिनों में युग्म दिन

अ.ह. - पूर्व व्यक्ते (1 मास तक)

सभी आचार्यों ने पुष्य नक्षत्र पुंसवनकर्म हेतु उपयुक्त बताया है -।

पुंसवन विधि

गोष्ठे जातस्य न्यग्रोधस्य प्रागुत्तराभ्यां शाखाभ्यां शुद्धे अनुपहते आदाय द्वाभ्यां धान्यमाषाभ्यां संपदुपेताभ्यां

गौरसर्षपाभ्यां वा सह दधि प्रक्षिप्य पुष्येण पिबेत्, तथैवापराञ्जीवकर्षभकापामार्गसहचरकल्कांश्च युगपदेकैकशो यथेष्टं वाऽप्युपसंस्कृत्य पयसा, कुड्यकीटकं 'मत्स्यकं वोदकाञ्जली प्रक्षिप्य पुष्येण पिबेत्, तथा कनकमयान् राजतानायसांश्च पुरुषकानग्निवर्णानिणुप्रमाणान् दधि पयस्युदकाञ्जली वा प्रक्षिप्य पिबेदनवशेषतः पुष्येण, पुष्योणैव च शालिपिष्टस्य पच्यमानस्योष्माणमुपाघ्राय तस्यैव च पिष्टस्योदकसंसृष्टस्य रसं देहल्यामुपनिधाय दक्षिणे नासापुटे स्वयमासिञ्चेत् पिचुना । यच्चान्यदपि ब्राह्मणा ब्रूयुराप्ता वा स्त्रियः पुंसवनमिष्टं तच्चानुष्ठेयम् । इति पुंसवनानि ॥ (च.सं.शा. ८/१९)

आचार्य चरक के अनुसार—

- गोशाला में उत्पन्न वट वृक्ष की पूर्व और उत्तर की ओर गई दो शाखाओं के दो अनुपहत 'शुङ्ग' लेकर रस गुण-वीर्य सम्पत् दो धान्यमाष (ब्रीहि भाष या सुवर्णभाष) या दो गौरसर्षप दही से पीसकर पुष्य नक्षत्र में पान करे।
- जीवक, ऋषभक, अपामार्ग, सहचरी का एक साथ या अलग-अलग एकल द्रव्य का कल्क बनाकर दुग्ध के साथ पुष्य नक्षत्र में पान।
- कुड्यकीटक मत्स्य (शफरी या सिधरी मछली) को एक अंजलि जल में डालकर पुष्य नक्षत्र में पान।
- सुवर्ण, रजत या लौह की अणुप्रमाण की (छोटी सी) पुरुषाकृति प्रतिमा बनाकर अग्नि में लाल तप्त होने तक गर्म कर दूध, दही, घी या एक अंजलि जल में उसे डालकर उस सम्पूर्ण दूध, दही या जल का पुष्य नक्षत्र में पान।
- शालिपिष्टी को जल में पकाते समय उससे उत्पन्न भाप को सूंघे तथा उस पिष्टी के जल संसृष्ट होने से उत्पन्न रस को रुई की पिचु द्वारा देहली पर सिर रखकर अपने हाथ से ही दक्षिण नासापुट में डालें।
- इसके अतिरिक्त अन्य जो भी ब्राह्मण या आप्तस्त्रियाँ बतावें उन्हें पुंसवन मानकर उसका प्रयोग करें।

लब्धगर्भायाश्चैतेष्वहःसु लक्ष्मणावटशुङ्गसहदेवाविश्वदेवानामन्यतमां क्षीरेणाभिषुत्य त्रींश्चतुरो वा बिन्दून् दद्यादक्षिणे नासापुटे पुत्रकामायै ('वामे दुहितृकामायै' अधिकः पाठः क्वचित्पुस्तके) न च तान्निष्ठीवेत् ॥ (सु.सं.शा. २/३४)

- लक्ष्मणा, वट के नवीन अंकुर, सहदेवा (कंधी), विश्वदेवा (गंगेरन) आदि अन्य औषधियों को दुग्ध के साथ पीसकर पुत्र इच्छा वाली स्त्री के दक्षिण नासापुट में तीन-चार बिन्दु डालना चाहिए तथा स्त्री को उसे थूकना नहीं चाहिए।
 - कन्या इच्छा वाली स्त्री के वाम नासापुट में डालना चाहिए।
- टीकाकार डल्हन ने इसके विवरण में बताया है कि पुष्प-फल युक्त लक्ष्मणा को शरद् ऋतु में शनिवार की संध्या के पुष्य नक्षत्र में मन्त्रपूर्वक उद्धृत कर, उसके चतुर्थ भाग खदिर कील (मूल) को किसी भी दिन हस्तमूल या पुष्य नक्षत्र में सूर्यास्त के बाद मन्त्र पूर्वक उद्धृत कर, समान वर्ण के बछड़े वाली गौ के क्षीर के साथ नस्य का प्रयोग गर्भ प्राप्ति के लिए ग्राम्यधर्म सेवन के पूर्व करें। तत्पश्चात् क्षीर एवं ओदन के भोजन का क्रम पाँच दिन तक करके ग्राम्यधर्म का सेवन करें।

आचार्य वृद्धवाग्भट ने चरक एवं सुश्रुत के कथन के साथ-साथ कुछ अन्य तथ्यों को भी बताया है। जैसे—

- पुष्य नक्षत्र में उद्धृत श्वेतवृहती मूल-कल्क के स्वरस का नस्य लें।
- उत्पलपत्र, कुमुदपत्र, लक्ष्मणा मूल या आठ वटशुङ्गो का नस्य लें।
- पुष्य नक्षत्र में उद्धृत लक्ष्मणा मूल-कल्क को उदुम्बर फल की मात्रा में लेकर गोदुग्ध के साथ पान करें।
- गौरदण्ड अपामार्ग, जीवक, ऋषभक, शंखपुष्पी, मध्यदण्डा, सहचर, नग्नजीव, अग्निजिह्वा तथा 8 वटशुङ्गो का प्रयोग करें।

आचार्य वाग्भट ने चरक एवं वृद्ध वाग्भट के सदृश वर्णन करते हुए अन्य तथ्य का वर्णन किया है—

- लक्ष्मणा मूल को दूध से पीसकर मुख से या नासा से पीने पर पुत्रोत्पत्ति एवं पुत्र की स्थिति होती है।
- आठ वटशुङ्ग को दूध के साथ पीसकर मुख या नासा से पान।
- जीवनीय गण की औषधियों का बाह्य एवं अन्तः प्रयोग।

आचार्य भावमिश्र ने निम्न योगों का उल्लेख किया है—

- एक पलाश पत्र को दूध के साथ पीसकर पान।
- शूकरशिम्बी-मूल या दधिफल (कपित्थ) का गुदा या भवलिङ्गी (इश्वरलिङ्गी) के बीजों को दूध के साथ पीसकर पान करना।
- पुत्रकमञ्जरि मूल (पतजिया), विष्णुकान्ता मूल एवं ईश्वरलिङ्गी (शिवलिङ्गी) के साथ आठ दिन तक पान।

योगरत्नाकर के अनुसार—

- भावप्रकाश वर्णित प्रथम दो योगों का स्पष्टतः वर्णन है।
- श्वेतवृहतीमूल को क्षीर के साथ पीसकर पुत्रेच्छा से दक्षिण नासापुट एवं कन्या इच्छा से वाम नासापुट में सेवन।

Physiological changes during pregnancy

Pregnancy is described as a condition or a state from the time of conception up to the time of delivery. A hormone indicating pregnancy can be detected in the blood of pregnant women as early as three days following fertilization and in the urine within one week of the first missed menstrual period. This hormone known as human chorionic gonadotropin (hCG) is produced by the placenta.

There are certain changes in a woman which can be identified by both the woman as well as a obstetrician. Certain changes during pregnancy also indicate whether the woman has conceived earlier or not.

Physiological changes in woman's body during pregnancy are due to the effects of specific hormones. These changes enable her to help in the development of fertilized ovum; to prepare the foetus, prepare her body for labour and lactation. A detailed knowledge about these changes help a obstetrician to identify not only the changes but also detect deviations from normal for an early appropriate intervention.

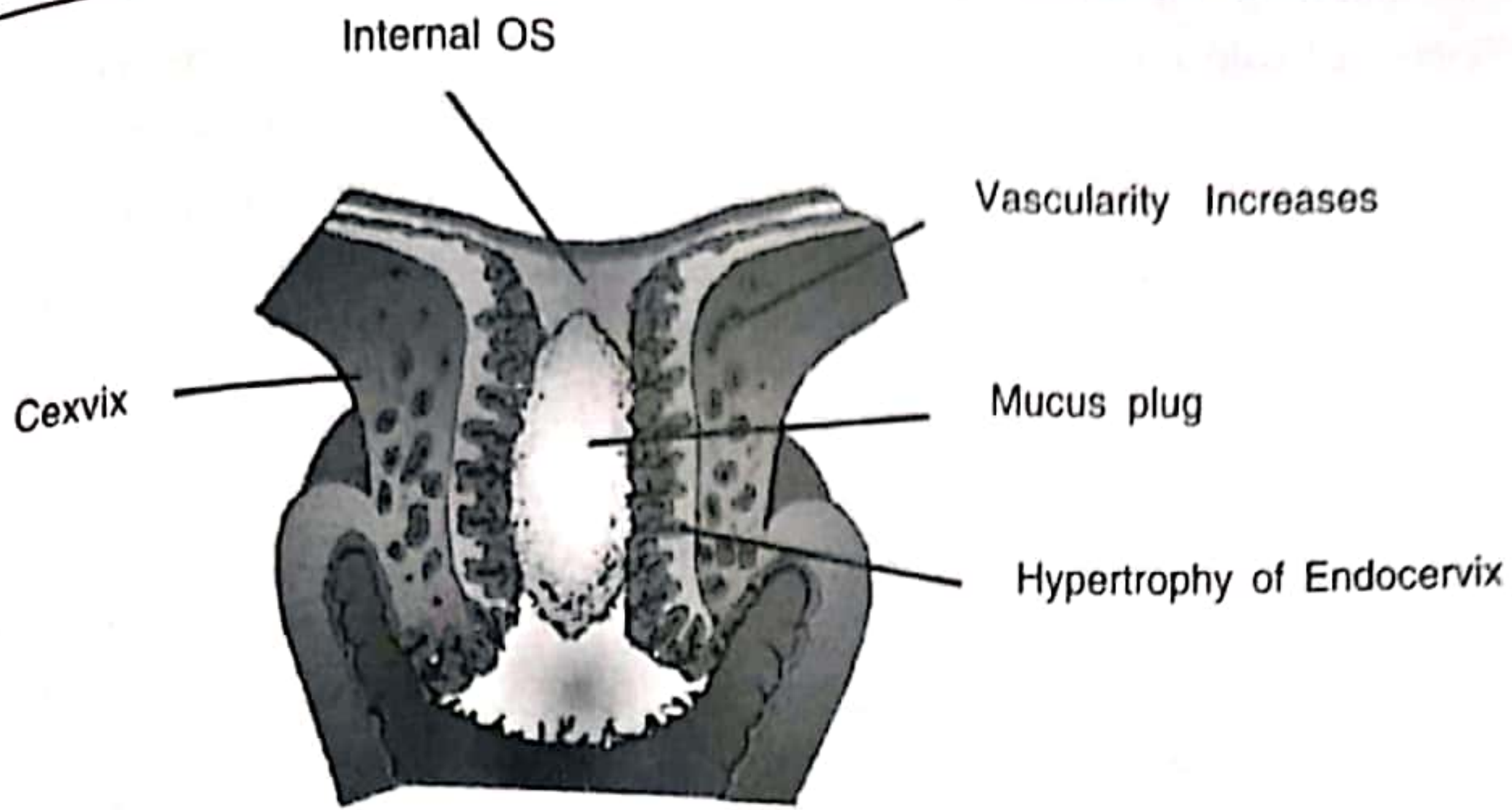
The following are a list of those physiological changes which will be a great help in rendering antenatal care to woman.

Maternal Physiology During Pregnancy

Reproductive System

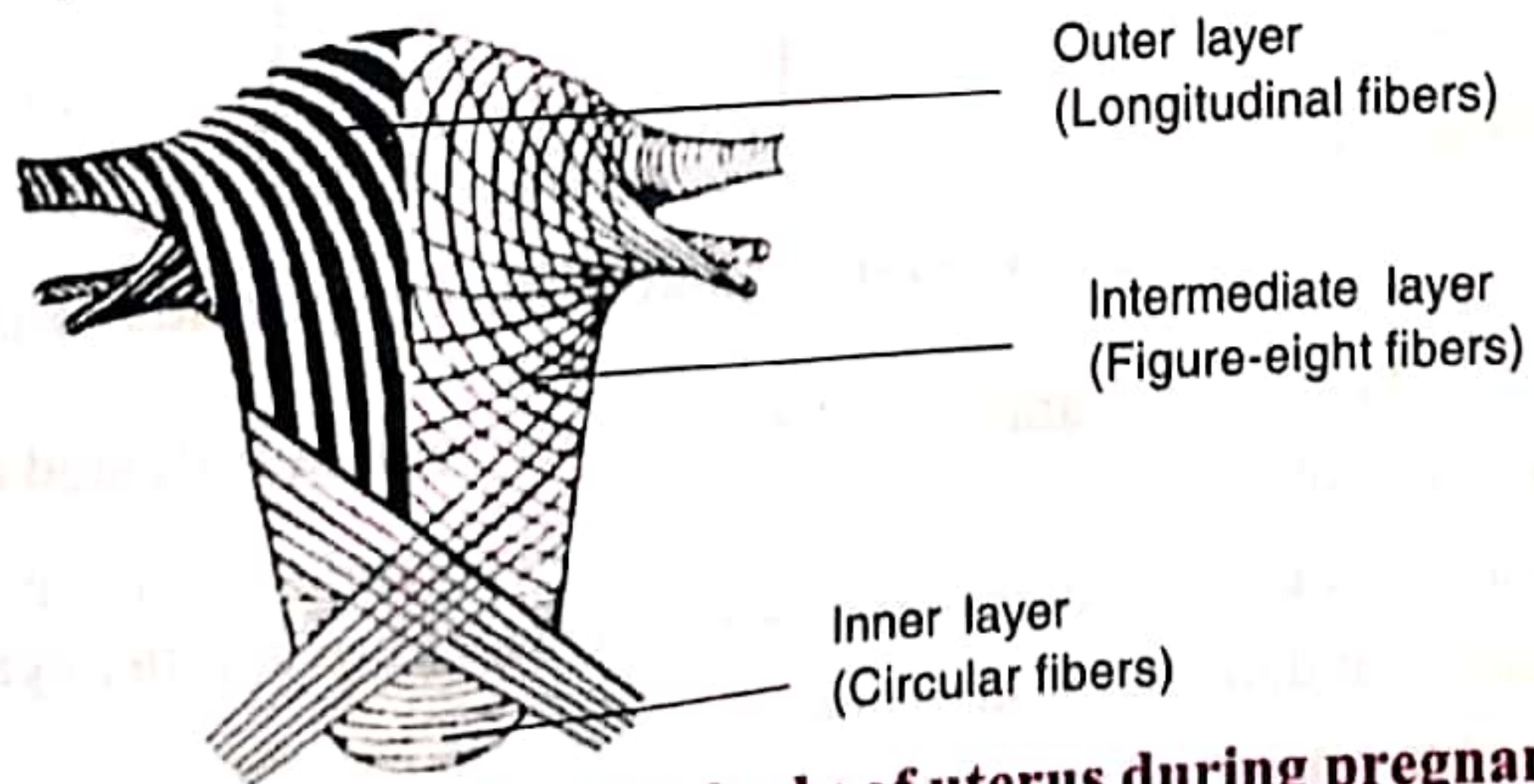
- a) **Vulva** - becomes vascular and hypertrophied, pigmented and varicose veins appear in some.
- b) **Vagina** - becomes vascular and hypertrophied, looks bluish, felt soft. Vaginal secretion, increases in amount and is acidic due to the production of lactic acid.
- c) **Cervix** - remains 2.5 cm long throughout pregnancy, but the hygroscopic properties of oestrogen cause it to increase in width. Oestrogen increases cervical vascularity and if viewed through a speculum the cervix looks purple. In late pregnancy, softening of the cervix occurs in response to increasing painless contractions occurring throughout pregnancy. The cervix acts as an effective barrier against infection, and also helps to continue pregnancy.

Cervical mucosa undergoes hypertrophy and hyperplasia and occupies inner half of cervix. A mucus plug called "operculum" is formed between the internal and external os.



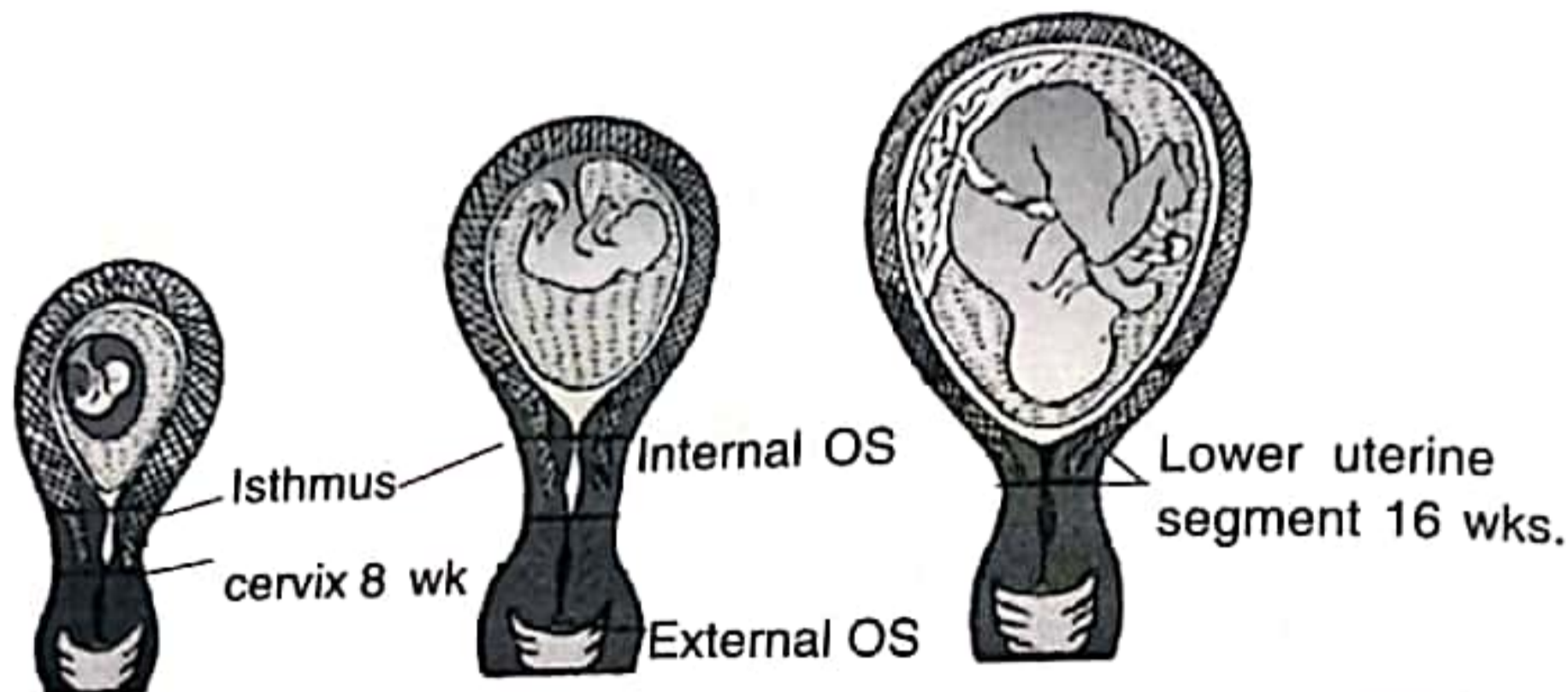
Cervical changes in pregnancy

d) **Uterus** : Gravid uterus gradually enlarges from 50 gm muscular organ to 900 gm at term pregnancy. Length becomes 30 cm; breadth 22.5 cm and thickness 20 cm. Uterine wall forms a sac containing amniotic fluid and foetus. The perimetrium is the outermost layer of the uterus. It does not totally cover the uterus. The myometrium or muscle coat surrounds the cornua, lower uterine segment and cervix during labour. The muscle layer is involved in the contraction necessary to expel the foetus at the end of the pregnancy. The outer longitudinal layer of muscle fibres contract and retract during labour causing upper segment to thicken. The thickened upper segment acts as a piston to force the foetus into the receptive, passive lower segment. During pregnancy, the muscle layer becomes more differentiated and organised which take part in expelling the foetus at term. Oestrogen is responsible for the growth of the uterine muscle. The endometrium is rich in blood supply and is known as the decidua when the fertilised ovum gets embedded in it.



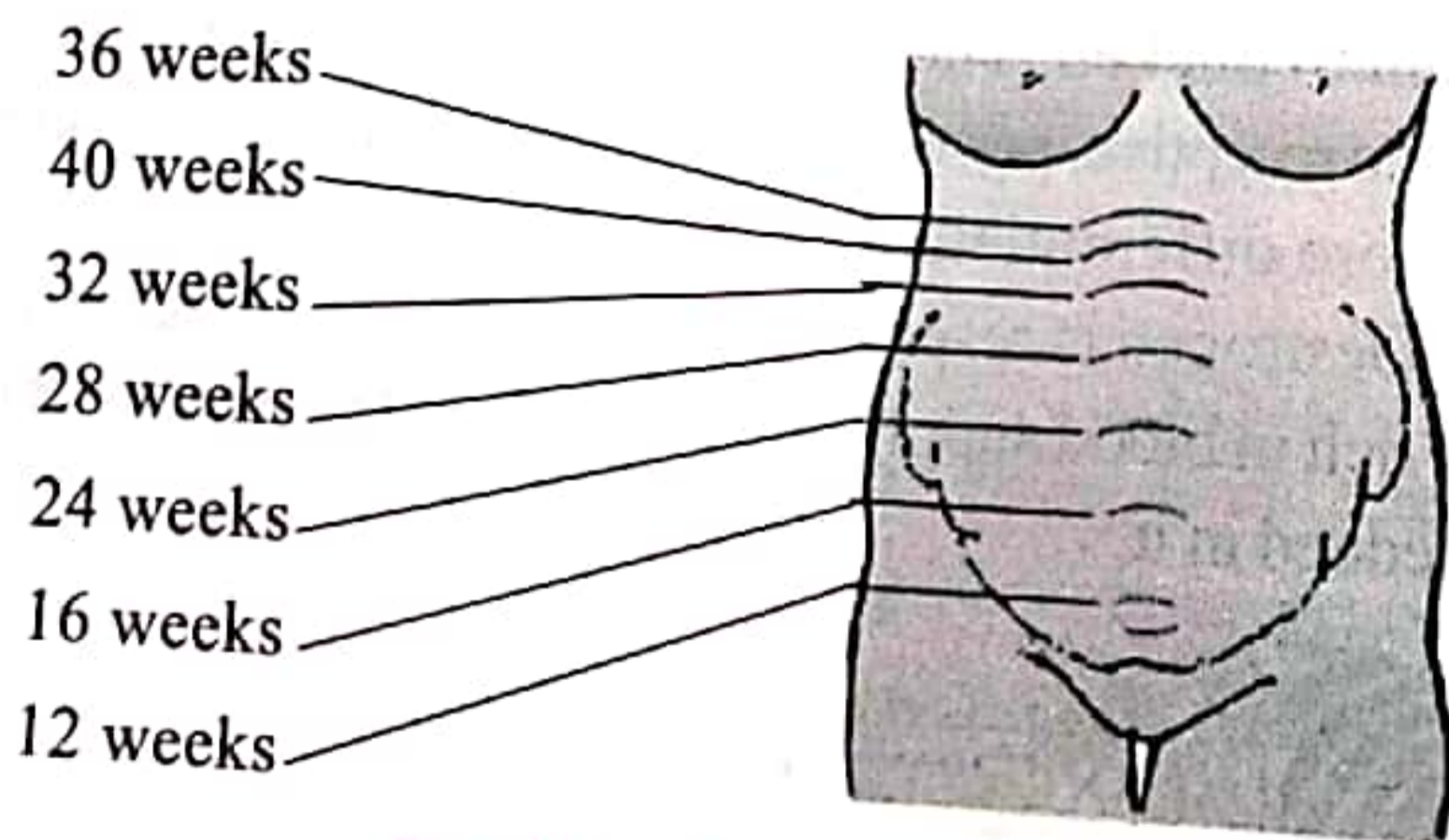
Growth of isthmus and its incorporation into body of uterus during pregnancy

Isthmus, above the internal os of cervix undergoes changes upto 12 weeks to pregnancy as it elongates. Thereafter it's cavity unfolds from above downwards to be included in the cavity of uterus. It forms the thinner lower uterine segment after 12th week. Lower uterine segment develops best during the last trimester as hemispherical segment.



Myometrium in three layers

Changes in Uterine Shape : The uterus changes its shape from early pregnancy to anticipate foetal growth and to accommodate increasing amounts of liquor and placenta tissue. This causes pressure on other pelvic organs. At 12th week of pregnancy, the uterus is no longer ante-verted and ante-flexed.



Fundus of uterus at different periods of gestation

12th Week : The fundus of the uterus may not be palpated abdominally above the symphysis pubis.

16th Week : The uterus reaches half way between the symphysis pubis and the umbilicus and the shape is ovoid.

24th Week : Fundus is at the level of umbilicus or one finger lower level of umbilicus.

28th Week : At the junction of the lower third and upper two-thirds of the distance between the umbilicus & xiphisternum.

32th Week : The lower uterine segment can be identified. It is still not complete but can be defined as that portion lying below the reflection. The fundus lies at the junction of upper third and middle third between umbilicus and xiphisternum.

36th Week : The uterus now reaches its highest level at the xiphisternum (near subcostal arch).

38th Week : The fundus sinks down to the subcostal arch below ensiform cartilage, the level of 32th week pregnancy. This is called 'lightening'. The lower uterine segment gets relaxed and stretched whereas the cervix is shortened and soft. The uterus is now ready for labour.

e) **Ovaries :** Ovulation ceases throughout pregnancy. Corpus luteum of usual menstrual cycle persists and enlarges to 2.5 cm till 8th week due to the changes in the fertilized ovum (trophoblast) and helps in producing hormones.

f) **Breasts :** Under the stimulation of estrogen and progesterone the breasts increase in size, nodularity and sensitivity throughout pregnancy with increased vascularitis. The nipples enlarge, become dark, erect and the gland of Montgomery enlarges. Total weight becomes 0.4 kg. Enlargement is due to alveolar proliferation and deposition of fat. A clear sticky fluid can be squeezed from 16th week onwards. Production of colostrums occurs in late pregnancy. Areola becomes dark pigmented, which is primary areola, and a second zone of pigmentation appears around the primary areola in second trimester, which is secondary areola. The breast ductal system has intense growth during the trimester pregnancy. As pregnancy progresses, the alveolar cell becomes secretory.

Changes in other Systems of the Body

Cardiovascular System

Heart works more during pregnancy : There is increase in the cardiac volume by 10% but there is no change in E.C.G. except slight left axis deviation. Cardiac output increases by 15-30%. Cardiac output increases due to increased heart rate and increase stroke volume. Pulse rate near term increases by 10 per minute.

Blood Pressure and Blood volume : Blood pressure remains within normal limits with mid pregnancy drop in blood pressure in some women.

Venous pressure— Femoral venous pressure rises from 10 cm water to 30 cm water. This is due to pressure of gravid uterus on pelvic veins.

Blood volume increases from 3rd month and reaches a peak of 25% rise at 32 weeks. The red cell volume increases by 200 ml, plasma volume increases to 1000 ml. On the whole the blood flow increases to many parts of the body such as uterus, pulmonary, renal and skin. Platelet count shows slight decrease due to increased concentration and ESR increase to 40-45 mm due to fibrinogen content.

Respiratory System

Mucous of upper respiratory tract shows hyperaemia and congestion. There is increased inspiration so the increased oxygen intake results in improved oxygen supply to the foetus. Due to increased expiration, more carbondioxide is expelled, there is low maternal carbondioxide leading to easy transfer of CO₂ from foetus to mother's blood.

In the later weeks of pregnancy (around 36 weeks), due to the pressing of the gravid uterus on diaphragm there is a complaint of breathing difficulty which is relieved after lightening.

Digestive System

The muscle tone of the gastrointestinal system is reduced due to progesterone effect. Relaxation of cardiac sphincter leads to regurgitation of stomach juice and heart burn. Diminished gastric mortality resulted in slow emptying of stomach. Gums become spongy and vascular and may bleed during brushing in many women. The intestines show reduced motility, there is better absorption of food and constipation. There is a tendency to gall stone formation due to high serum cholesterol.

Nervous System

Slumpliness is common and mood changes occur in many woman. Pregnancy is one of the periods in a woman's life when there seems to be lowering of the ability to cope with emotional experiences in life. Even the cases where the coming of the baby is welcome with a mild degree of depression or irritability may be evident during the early months. Craving for certain sour food, spiced food, coal, clay ash also called "Pica" may be due to nausea rather than to nervous instability. Neuritis is common in pregnancy.

Urinary Tract

Frequency of micturition is common in early pregnancy and late pregnancy. Stress incontinence may also occur. Due to dilatation of ureters and renal pelvis during early pregnancy which continues till mid-pregnancy there is a tendency for urinary stasis and these favours infection. Renal function is augmented during pregnancy.

Locomotor System

Due to lordosis of pregnancy and relaxation of joints under the influences of relaxin

hormone backache is common. Leg cramps occur due to pressure on sacral and lumbar plexus. Gait becomes waddling.

Endocrine System

1. **Gonadotrophin** : FSH and LH are inhibited by placental steroids. Prolactin rises throughout pregnancy. Protein hormones, hCG appears in blood and urine from 8th day of fertilisation, and reaches a peak at 9th-10th week, thereafter drops rapidly and remains at a plateau for the rest of pregnancy. hCG values are increased in presence of multiple pregnancies.

Oestrogen and progesterone levels increase and continue to be secreted from the placenta during the last 6 months of pregnancy. Progesterone is produced by all steroid-forming glands including ovaries and adrenal. It acts as precursor for other hormones. During pregnancy, progesterone is secreted by corpus luteum up to 8 weeks of pregnancy. Thereafter, the placenta takes over the function of progesterone production up to term. The average levels of plasma progesterone at 12th week, 28th week and term approximate 25ng/ml, 80ng/ml and 300 ng/ml respectively. Low progesterone levels found in ectopic pregnancy and abortion. High progesterone levels indicate hydatidiform mole & Rh-isoimmunisation.

2. **Prolactin** : During pregnancy, prolactin values rise to about 100 mg/ml due to maternal pituitary activity. The decidual lining of the uterus contributes to amniotic fluid content of prolactin.
3. **Oestriol** : Oestriol levels gradually reaches upto 25-30 ng/ml at term. Extremely low Oestriol denotes foetal death or anencephaly. High circulating oestriol values are associated with multiple pregnancies or Rh isoimmunisation. A normal oestriol level signifies foetal well being.
4. **HPL (Human Placental Lactogen)** : HPL levels vary directly according to placental mass. Therefore HPL levels are higher in multiple pregnancy.
5. Thyroid gland activity is increased.
6. Secretion of oxytocin stimulates uterine contraction at term and leads to labour.

Weight Gain

Continuous weight gain during pregnancy is a positive sign. Average weight gain during pregnancy is about 12 kilogram in the pregnant woman of average built and can be accounted for the weight of foetus, placenta, amniotic fluid, increase in weight of breasts and uterus, increase in blood value, extra cellular fluid and fat. Usually the mother gains about 3 kilogram during first half and 7 kilogram during second half of pregnancy.

Poor weight gain is due to nausea, vomiting, indigestion, underweight woman.

Inadequate food, overwork, maternal illness, intra-uterine growth retardation or foetal death are other factors.

Excessive weight gain is due to overeating, excess water intake, oedema, large foetus, multiple pregnancy and overweight of woman.

Body parts	Wt. (Kg)
Breasts	0.5
Fat	3.5
Placenta	0.6
Foetus	3.4
Amniotic fluid	0.6
Uterus (increase)	0.9
Blood volume (increase)	1.5
Extracellular fluid	1.0
Total	12.0

General Metabolism

The basal metabolic rate increases during the later half of pregnancy in response to the demands of the growth foetus and maternal tissues and so energy requirement is higher of total daily energy requirement increases by 300 K Cal.

Glucosuria occurs in 10 per cent of woman probably due to lowering of the renal threshold for glucose. Extracellular water retention is there. About 40% of women develop physiological ankle oedema during the last 12 weeks of pregnancy which disappears with rest and is rarely present in the morning. However, oedema in pregnancy should never be considered physiological until all pathological causes have been ruled out.

Skin Changes

Pigmentation becomes visible at various places of the body, i.e. breasts, face, skin, abdominal wall and external genitalia. Pigmentation of face is called chloasma, others are striae gravidarum and linea nigra.

Diagnosis of pregnancy

Signs and Symptoms of Pregnancy

A healthy married woman who has been menstruating regularly misses a period. In 98% of cases this is due to pregnancy. In these days the advanced diagnostic tests such

as ultrasonography, immunological tests for pregnancy has reduced or eliminated the needs to rely on the more inaccurate presumption of probable signs of pregnancy.

Signs of pregnancy are classified as:

- a) Presumptive signs and symptoms
- b) Probable signs
- c) Positive signs

Presumptive signs and symptoms

Mostly subjective, may be indicative of other illnesses.

- Amenorrhoea
- Morning sickness
- Fatigue
- Nausea and vomiting
- Breast changes
- Bladder irritability
- Darkening or pigmentation of face and breast
- **Quickening** – feeling of movement of foetus at about 16 to 20 weeks. Recording the date of quickening is a useful way to calculate the expected date of delivery when the mothers are unsure of her dates.

Probable signs

Objective but still not definite confirmation of pregnancy:

- Enlargement of abdomen and assessment of the number of weeks of pregnancy by palpation of abdomen.
- Pregnancy Tests: The urine of pregnant women contains hCG (Human chorionic gonatotrophin), one of the placental hormones, in fairly large concentration by the fifteenth day of pregnancy. More recently immunological pregnancy tests, dependent upon antigen-antiserum reaction, have replaced the biological tests. These tests are based on the reaction of human urinary gonadotrophin (HCG) to antiserum. The tests are easy to use clinically and are highly reliable, Also the test material is readily available commercially.
- Other signs are changes in the uterus, softening of the cervix uterine souffle, abdominal enlargement, Braxton Hicks contraction site.

Positive signs

It confirms pregnancy :

- Hearing of foetal heart sound.

- Active movements of the foetus felt by the examiner at about 22nd week of pregnancy.
- Ultrasound evidence of pregnancy.

Common signs and symptoms indicative of pregnancy

Absence of menstruation: It is a very important symptom of pregnancy, especially in a woman who has been having normal regular menstruation. In some women there may be slight bleeding during the first missed period, which is due to the implantation of the fertilized ovum into the walls of the uterus.

Morning sickness: Morning sickness refers to a feeling of nausea and vomiting on getting up in the morning. This can also occur at any other time of the day and normally does not last beyond the first three months of pregnancy.

Early breast changes: There may be prickling, tingling sensation in the breasts due to the increased blood supply, particularly around the nipples. The woman may experience painful and tense breasts. Bluish surface blood vessels become visible. The nipple area becomes darker and pigmented.

Bladder irritability: This results in increased frequency of urination.

The above signs and symptoms are such that they can be observed by the woman herself. While these are taken into consideration, diagnosis of pregnancy is usually done on the basis of the following measures :

Urine or blood test of the woman : This helps to detect the presence of pregnancy. For the urine test to be reliable, it should be carried out at least two weeks after the first missed period.

Abdominal examination: The pregnant woman's abdomen does not get enlarged in the first three months as the uterus is lying in the pelvic cavity. After three months, the obstetrician can assess the progressive growth of the uterus by abdominal examination. Foetal parts can be palpated on abdominal examination by 6 months and foetal heart sounds can be heard per abdomen by the use of an foetoscope or stethoscope.

Internal examination of the woman by the obstetrician : Blue discolouration of the vagina, softness of cervix and growth of the uterus are indicative of pregnancy.

Ultrasound: Visualization of foetus by ultrasound after six weeks of fertilization confirms the diagnosis.

The pregnant woman may, by the end of the 4th month, herself begin to feel the movements of the foetus. The movements increase as the pregnancy progresses.

As soon as the signs and symptoms of pregnancy become noticeable, that is, the

When a woman's pregnant state is identified, she should consult an obstetrician for regular antenatal checkups and plan for better output of pregnancy.

Establishing Duration of Pregnancy

After the confirmation of pregnancy, it is necessary to estimate the stage of pregnancy and the probable date of delivery known as "due date" or "estimated date of delivery" (EDD). The length of the pregnancy is calculated from the first day of the last menstrual period. Pregnancy lasts for approximately 280 days i.e. 40 weeks (or 9 months and one week) from the first day of the last period.

$EDD = LMP + 9 \text{ Calendar months} \& 7 \text{ days}$

eg. LMP is 1st January 2018

Then $EDD = 1^{\text{st}} \text{ January} + 9 \text{ calendar month} = 1^{\text{st}} \text{ October}$

further add 7 days = 8th October 2018

However, it is likely that birth will take place any time approximately two weeks before or after this date. This is because the length of any pregnancy depends on the maturity of the baby and also the length of the woman's menstrual cycle. The woman with irregular menstrual cycle needs additional help in calculating EDD, for instance by internal pelvic examination, by palpating the uterus, by estimating from the date the mother felt the first foetal movement or when foetal heart sound is first heard by foetoscope or by getting the ultrasound done, which is an advanced and expensive test.

Assessment of Gestational Age

Term pregnancy is from the completion of 37 weeks to completion of 42 weeks. Preterm pregnancy is from 28 completed weeks till completion of 37 weeks. Post term pregnancy is from completion of 42 weeks and beyond. According to Arias (1993) the reliability of the expected date of delivery as calculated from the period of gestation can be assessed both by clinical data and findings of ultrasonography examination. Depending upon the accuracy of EDD, it could be categorised as excellent, good or poor.

Excellent Dates

- Women with adequate clinical information having known L.M. P.; 28-30 days cycle; no recent use of oral contraceptives pills; uterine size in agreement with the dates and the ultrasound examination between 16 to 24 weeks indicating that the foetal measurements are in agreement with the gestational age.
- Patients with inadequate or incomplete clinical information but with two ultrasound examination between 16-24 weeks showing linear foetal growth and similar EDD.

Good Dates

- a) Patients with adequate clinical information (as defined above) and one confirmatory ultrasound examination after 24 weeks of gestation.
- b) Patients with inadequate or incomplete clinical information and two or more ultrasound examination showing adequate growth and similar EDD.

Poor Dates

Any clinical information different from those listed above.

Diagnosis of pregnancy in first trimester (up to 12 weeks)

Once pregnancy has been confirmed, the woman may experience many different reactions. Although for most this is a time of great joy and satisfaction, many may experience a period of anxiety. The woman body will experience changes in her body that are beyond her control. The first three months are often very uncomfortable.

Subjective symptoms

1. **Amenorrhoea:** This is the first warning symptom in normally menstruating woman exposed to the risk of pregnancy. This is not wholly reliable as this may also result from chronic debilitating diseases, emotional stress and other factors.

2. **Morning sickness:** In the early weeks nausea and vomiting are common. It starts in about 4-6 weeks of pregnancy and may continue till about the 16th week. Usually, it is present in the early hours of the morning and shows signs of abatement as the day progresses. In some cases it may continue throughout the day and in some only nausea may be present. In some there may not be morning sickness.

3. **Salivation and changes in disposition:** Salivation is an early symptom and is pronounced in some cases. The changes in disposition may be shown by a change in the temperament, resulting in the patient becoming irritable and capricious. She may evince a desire for articles of food quite at variance with her ordinary preference. These are termed the longings or pica of pregnancy.

4. **Irritability of bladder:** Frequency of micturition is sometimes complained, and is due to pressure exerted on the bladder by the growing uterus. As the uterus increases in size and becomes an abdominal organ, this pressure is relieved and the symptoms gradually disappear.

Objective signs

1. **Changes in the breast:** This is marked, particularly in a prim gravida. There is

general enlargement with prominence of vein and increased pigmentation, forming primary and secondary areolae. The nipples also become more prominent, erectile and swollen.

2. **Bluish discolouration of vagina:** This sign is generally detected between the 4th and 8th week of pregnancy. The intensity increases up to 16th week of pregnancy. There may also be a sensation of increased warmth in the genital resulting from augmented blood supply to these parts.

3. **Uterine changes:** The uterus is perhaps the most important organ to undergo remarkable changes during pregnancy. In the early weeks of pregnancy, changes in size, shape and position occur. This can be made out by bimanual examination either by abdomen-vaginal or abdomino-rectal method of palpation.

Goodell's sign : At about 6th week the vaginal portion of the cervix feel softer because of increased vasularization.

Hegar's sign : The cervix and bulky uterus feel separated and the cervix is comparatively firm between the 6th and 10th weeks of gestation on bimanual examination.

Jacquemier's or Chadwicks signs : On speculum inspection, the cervix and vagina appear to have a bluish or purplish discoloration at about 8th week of pregnancy.

Osiander's sign : At 8th week there is increased pulsation, felt through the lateral fornices. The size of uterus enlarged to the size of hen's egg, cricket ball and fetal head at 6th, 8th and 12th week respectively. The shape of uterus become globular at 12th week.

Investigations :

- **Immunological Tests**— Modern sensitive immunological tests for early diagnosis of pregnancy is based on the detection of bile subunit of hCG in the maternal serum or urine. hCG reaches urine approximately 8 days after a missed period. HCG in the urine is 1.5-3.5 IU/ml.
- **Gravida test :** It is based on the latex agglutination inhibition (LAI) technique. It is an accurate and inexpensive test requiring 2 minutes time for its performance. Absence of agglutination indicates presence of pregnancy.
- **Ultrasonography :** This is a very reliable test. As early as the 5th week of intrauterine life, the gestational sac can be identified. The foetal node can be observed after 6th week and foetal cardiac pulsation by the 8th week.

Pregnancy Tests (BETA HCG)

Test	Test sensitivity	Time taken	Inference	Positive on
Immunological tests (Urine)				
Agglutination inhibition test (Latex test)	0.5-1 (IU/ml) (Urine)	2 min.	Absence of agglutination	2 days after missed period
Direct latex agglutination test	0.2 (IU/ml) (Urine)	2 min.	Presence of agglutination	2-3 days after missed
Two-site sandwich immunoassay (membrane elisa/card tests)	30-50 mIU/ml (Urine)	4-5 min.	Colour bands in the control as well as in test window	On the first day of the missed period (28 th day of cycle)
Enzyme-linked Immunosorbent Assay (ELISA)	1-2 mIU/ml (Serum)	2-4 hours		5 days before the first missed period
Radioimmunoassay (β subunit)	0.002 IU/ml	3-4 hours		25 th day of cycle
Immuno radiometric assay (IRMA)	0.05 mIU/ml (Serum)	30 min.		8 days after conception

Diagnosis of pregnancy in Second Trimester (13-28 weeks)

In the next three months (second trimester) the pregnancy is usually confirmed to the outside world. With the growth of the foetus, the woman's abdomen increasingly protrudes out and the pregnancy is no longer a secret. The foetus is now moving in the womb and the woman often feels a unique closeness to the baby. The woman feels at her best during this period, as she does not usually have any significant discomfort.

Subjective symptoms : During second trimester some of the symptoms present during first trimester gradually disappear. Morning sickness, increased salivation and frequent micturation generally disappear during this period.

An important symptom felt during this trimester is quickening. The active foetal movements are felt by the mother at the end of 16th week. The term quickening is applied to the first recognition of foetal movement by the mother. The date of quickening if ascertainable from the patient is helpful in calculating the period of pregnancy and probable date of delivery.

Objective signs

1. **Changes in the skin:** Pigmentation is one of the characteristic changes that take place in second trimester. It is marked more on the forehead and cheeks in the form of

brown patches (Chloasma) at about 24th week. It may also be seen on the breasts and over the abdominal wall.

2. **Changes in the shape and size of uterus:** The uterus becomes ovoid and can be felt at different levels in the abdomen in successive periods of pregnancy as described on page no. 153.

3. **Intermittent uterine contractions:** This is known as braxton hick's sign and is found irrespective of the foetus being dead or alive.

These contractions occur throughout the pregnancy at long intervals and last for few seconds.

4. **Active foetal movements** when felt or seen afford positive evidence of continuing pregnancy and of a live foetus. They are noticed after 16th week of pregnancy.

5. **Palpation of the foetal parts:** About the middle of pregnancy, the foetus is generally increased to a size when it can be recognized by abdominal palpation. As pregnancy progresses, this sign is of value, not only in detecting pregnancy but also in ascertaining the various positions of the foetus in utero.

6. **Auscultatory signs:** Auscultation over the abdomen during pregnancy is useful to elicit various sounds, some of which are of great importance in the positive diagnosis of pregnancy.

The foetal heart sound : It can be heard from about the 17th to 20th weeks of pregnancy using Pinard's fetoscope. This is the only sign of pregnancy which by itself in the absence of others is perfectly reliable for diagnosis. The point of greatest intensity of foetal heart sounds vary with the position of the foetus in utero. Ordinarily the foetal heart beats 120-160 times a minute.

Ultra sound doppler, Echocardiography can also be used to monitor foetal heart beats. Visualisation of heart motion by ultrasonography is possible from the 7th week of pregnancy.

Other sounds that may be heard are due to the movements of the foetus, intestinal movements and maternal aortic pulsation.

7. **Perception of foetal movements:** These may be elicited by internal or external manipulation producing a passive movement of the foetus in utero.

8. **Braxton : Hicks contractions** are evident.

Investigations :

a) X-rays are able to detect the foetal skeletal shadow beyond about 16 weeks (not advised).

- b) By Sonography, one can detect not only foetal skeleton and foetal organs, but it also reveals the location of the placenta, amount of amniotic fluid present, condition of the internal os.

Diagnosis of pregnancy in Third Trimester (29-40 weeks)

In the last three months (third trimester) the woman's normal daily activities start becoming tedious because of her size. She finds bending difficult.

Symptoms :

- Enlargement of abdomen is progressive in later part of pregnancy,
- Lightening also takes place and
- Frequency of micturition may be there.

Signs :

- Uterine shape becomes more globular.
- Fundal height continues to grow as described earlier.
- Braxton-Hicks contraction are more evident.
- Foetal movement are easily palpable and also can be noticed on inspection.
- Foetal parts can be palpable.
- Auscultation reveals a regular foetal heart rhythm.

Investigations :

- Sonography and X-rays

गर्भिणी व्यवस्था

गर्भिणी परिचर्या

क. गर्भिणी हेतु पथ्य आहार-विहार-

तस्मादहितानाहारविहारान् प्रजासंपदमिच्छन्ती स्त्री विशेषेण वर्जयेत् । साध्वाचारा चात्मानमुपचरेद्धिता-
नाहारविहाराभ्यामिति ॥ (च.सं.सा. 8/21)

उत्तम गुणयुक्त सन्तान की इच्छा रखने वाली स्त्री को अहित आहार एवं विहारों को विशेष रूप से त्याग देना चाहिए।
दुर्गुण आचरणों से युक्त रहती हुई स्त्री को हितकारी आहार एवं विहारों द्वारा अपने शरीर की रक्षा करनी चाहिए।

गर्भिणी प्रथमदिवसात्प्रभृति नित्यं प्रहृष्टा शुच्यलंकृता शुक्लवसना शान्तिमङ्गलदेवताब्राह्मणगुरुपराच
भवेत्,हृद्यं द्रव्यं मधुरप्रायं स्निग्धं दीपनीयसंस्कृतं च भोजनं भोजयेत्, सामान्यमेतदाप्रसवात् ॥

(सु.सं.शा. 10/3)

गर्भिणी गर्भावस्था के प्रथम दिन से सदा प्रसन्नचित्त, पवित्र, अलंकारयुक्त, श्वेत वस्त्र धारण करके, शान्ति कर्म, मंगल
कर्म, देवता-ब्राह्मण-गुरु की पूजा करे। उसके शयन तथा आसन मृदु वस्त्र से युक्त होना चाहिए, शयन एवं आसन न
अधिक ऊँचा, न निराधार हो तथा पीड़ा रहित हो। हृद्य (प्रिय), द्रव, मधुर प्राय, स्निग्ध तथा दीपनीय द्रव्यों से युक्त भोजन
करें। इस प्रकार प्रसवकाल तक सामान्य परिचर्या का पालन करें।

गर्भसमानयोगक्षेमा हि गर्भिणी भवति ।

तस्माद्विशेषतस्तां प्रियहिताभ्यां गर्भोपघातकरेभ्या रक्षेत् ॥

(अ.सं.शा. 2/58)

तत्मात्प्रजासंपदमिच्छन्तौ साध्वात्मानमुपाचरेतां । विरोधेण नारी ॥

(अ.सं.शा. 2/62)

उपचारः प्रियहितैर्भर्त्रा भृत्यैश्च गर्भधृक् ।

नवनीतघृतक्षीरैः सदा चैनामुपाचरेत् ॥

(अ.ह.शा. 1/43)

वृद्ध वाग्भट ने बताया है कि गर्भिणी का योग (सुखादि) तथा क्षेम (अहित परिवर्जन) गर्भ के समान होता है, इसलिए
इसकी प्रिय एवं हितकर आहार-विहार द्वारा गर्भ को नष्ट करने वाले भावों से रक्षा करनी चाहिए। अर्थात् सन्तान की कामना
वाले माता-पिता को भी श्रेष्ठ बनाएँ। विशेषकर स्त्री अपने को उत्तम गुणवती बनाये।

वाग्भट के अनुसार पति या भृत्यों द्वारा किया गया प्रिय एवं हितकारी उपचार गर्भ को धारण कराने वाला होता है।
गर्भिणी नवनीत, घृत तथा क्षीर का सदा प्रयोग करे।

आचार्य काश्यप ने गर्भिणी परिचर्या का वर्णन अनेक स्थानों पर विस्तृत रूप में किया है। गर्भिणी को उष्ण
जल, दुग्ध एवं मांसरस का प्रयोग करने का निर्देश दिया है। दुग्ध के प्रयोग से गर्भ पुष्टि एवं दृढ़त्व प्राप्त करता
है।

गर्भाधानकरं	मांसमन्ते	पुष्टिकरं	तथा ।
गर्भिणीनां च	नारीणां	वातप्रशमनं	परम् ॥
गर्भकालं च	बलानां	सरसं	परमौषधम् ॥
क्षीण(र)धिद्धो	मांसरसो	मधुरो	लवणोऽपि वा ॥
.....गर्भकाले		च	शष्यते ।

(का.सं.खि. 24/6,7,11)

मांसरस गर्भाधान कारक (गर्भ स्थिति कराने वाला), गर्भ पुष्टि कारक, वातशामक होता है। गर्भ काल में रसयुक्त मांस (मांसरस) श्रेष्ठ औषधि होता है। दूध के द्वारा सिद्ध किया हुआ मधुर अथवा लवण मांसरस गर्भकाल में प्रशस्त माना है।

आचार्य भावमिश्र ने आचार्य सुश्रुत सदृश ही वर्णन किया है।

सूरणानि प्रदेयानि गौल्यानि सरसानि च । पथ्येहितानि.....॥

(हा.सं. तृतीय स्थान 49/8)

आचार्य हारीत ने रस सहित सूरण एवं गौल्य पदार्थ (मल को सुखाने वाले आहार) को गर्भिणी हेतु पथ्य बताया है। साथ ही पंचम एवं अष्टम मास में ब्राह्मणों द्वारा मंगल कर्म करके सगोत्रीय व्यक्तियों को भोजन कराने की निर्देश दिया है।

योगरत्नाकर ने "क्षीरदोष चिकित्सा" अध्याय में गर्भिणी हेतु पथ्य आहार-विहार का वर्णन किया है—

शालि-षष्टिक चावल, मूद्र, गोधूम, लाजा का सतू, नवनीत, घृत, क्षीर, रसाला, मधु, शर्करा, पनस, कदली, धत्री, द्राक्षा, अम्ल-मधुर-शीतल पदार्थ, कस्तूरी, चन्दन, माला, कर्पूर का लेप, चन्द्रिका (चन्द्रमा की किरण) स्नान, अम्यंग, मृदु शय्या, हिमानिल (शीतल वायु), संतर्पण आहार, प्रिय आलिङ्गन, मनोरम विहार, प्रिय आहार-विहार गर्भिणी के लिए सदा पथ्य है।

शार्ङ्गधर के अनुसार लाक्षादितैल के बार-बार अम्यंग से गर्भिणी स्त्री का गर्भ पुष्ट होता है।

वाग्भटद्वय, भावमिश्र एवं योगरत्नाकर के अनुसार गर्भिणी एवं मृत प्रसवा वाली स्त्रियों हेतु "फलघृत" का पान प्रशस्त है।

ख. गर्भिणी के स्नान हेतु जल— वाग्भटद्वय ने गर्भिणी के स्नान हेतु विभिन्न औषधियों से साधित जल का निर्देश दिया है।

बिल्वकार्पासीफम्फणापाटलीपिचुमन्दाग्निमन्थमांसीवर्धमानकपत्रभङ्गक्वाथेन शीतेन सर्वगन्धोदकेन वा गर्भिण्याः प्रत्यहं स्नानमुपदिशेत् ॥ (अ.सं.शा. 3/14)

वातघ्नपत्रभङ्गाम्भः शीतं स्नानेऽन्वहं हितम् ॥ (अ.हशा. 1/68)

वृद्ध वाग्भट ने बिल्व, कपास, फम्फणा (सरवाल), पाटली (गुलाब का पुष्प या पादल), पिचुमन्द (बकायन), अग्निमन्थ, जटामांसी, वर्धमान (एरण्ड) के पत्र को कूटकर बनाये गये शीतल क्वाथ अथवा सर्वगन्धोदक से गर्भवती को प्रतिदिन स्नान का निर्देश दिया है।

वाग्भट ने नवम मास में वातघ्न द्रव्यों के पत्तों को कूटकर बने क्वाथ को शीतल कर प्रतिदिन स्नान का निर्देश दिया है।

ग. गर्भिणी हेतु मणि

त्रैवृतं तु मणि कृत्वा तं श्रोण्यां गर्भिणी सदा ।

(का.सं.खि. 10/181)

गर्भिणी को सदा त्रिवृत की मणि बनाकर श्रोणि प्रदेश में धारण करना चाहिए।

महत्वपूर्ण—काश्यप- त्रिवृत मणि धारण- गर्भिणी को श्रोणि प्रदेश में सूतिका को सिर पर

उपर्युक्त वर्णित गर्भिणी हेतु पथ्य आहार-विहार का संक्षिप्त रूप से विवरण निम्नलिखित प्रकार से दिया जा रहा है।

पथ्य आहार

- दीपनीय द्रव्यों से साधित हृद्य, द्रव, मधुर एवं स्निग्ध आहार का प्रयोग ।
- जीवनीयगण के द्रव्यों का बाह्य एवं आभ्यन्तर प्रयोग ।
- स्थान, ऋतु एवं अग्नि के अनुसार आहार ग्रहण करना ।
- दुग्ध, घृत एवं नवनीत का प्रयोग ।
- उष्ण जल एवं मांस रस का प्रयोग हितकर होता है ।
- सूरण एवं गौल्य पदार्थ रस सहित सेवन ।
- शालि-षष्टिक चावल, मुद्ग, गोधूम, लाजा का सत्तू, नवनीत, घृत, क्षीर, रसाला, मधु, शर्करा, पनस, कदली, धात्री, द्राक्षा, अम्ल-मधुर-शीतल पदार्थ ।

पथ्य विहार

- पवित्र आचरण, स्वच्छ एवं शुक्ल वस्त्र धारण, अलंकार धारण, प्रतिदिन स्नान (वाग्भट वर्णित औषधिसिद्ध जल से)।
- सदैव प्रसन्न रहना चाहिए ।
- सोने एवं बैठने का स्थान स्वच्छ, मृदु एवं अपाश्रययुक्त होना चाहिए ।
- चन्द्रग्रहण तथा सूर्यग्रहण के समय गर्भगृह में शान्ति-होम आदि क्रिया करना ।
- प्रज्वलित अग्नि में घृत की आहुति देनी चाहिए ।
- शरीर के सभी सूत्र या धागे खोल देना चाहिए ।
- त्रिवृत मणि का श्रोणि में धारण ।
- चंद्रिका स्नान, कस्तूरी, चंदन, माला धारण, कर्पूर का लेप ।
- मनोरम विहार
- पंचम एवं अष्टम् मास में ब्राह्मणों द्वारा मंगलकर्म कराकर सगोत्रीय व्यक्तियों को भोजन देना ।

घ. गर्भिणी हेतु मासानुमासिक पथ्य

आचार्य चरक, सुश्रुत, वृद्धवाग्भट, हारीत एवं भेल ने गर्भिणी के मासानुमासिक पथ्य आहार का वर्णन किया है। प्रथमे मासे शङ्कित चेद्वर्धमापत्रा क्षीरमनुपस्कृतं मात्रावच्छीतं काले कोल पिबेत्, सात्प्यमेव च भोजनं सायं प्रातश्च भुञ्जीत; द्वितीये मासे क्षीरमेव च मधुरौषधसिद्धं; तृतीये मासे क्षीरं मधुसर्पिर्ध्यामुपसंसृज्य; चतुर्थे मासे क्षीरनवनीतमक्षमात्रमश्नीयात्; पञ्चमे मासे क्षीरसर्पिः; षष्ठे मासे क्षीरसर्पिर्मधुरौषधसिद्धम्य पाणितलमात्रं काले कालेऽस्यै पानार्थं दद्यात् ।..... अष्टमे तु मासे क्षीरयवागूं सर्पिष्मतीं काले काले पिबेत्; तत्रेति भद्रकाप्यः, पैङ्गल्यावाधो ह्यग्न्या गर्भमागच्छेदिति; अस्त्वत्र पैङ्गल्यबाध इत्याह भगवान् पुनर्वसुरात्रेयः, न त्वेवैतन्न कार्यम्, एवं कुर्वन्ती ह्यरोगाऽऽरोग्यबलवर्णस्वरसंहननसंपदुपेतं ज्ञातीनामपि श्रेष्ठमपत्यं जनपति । नवमे तु खल्वेनां मासे मधुरौषधसिद्धेन तैलेनानुवासयेत् । अतश्चैवास्यास्तैलात् पिचुं योनौ प्रणयेद्वर्धस्थानमार्गस्नेहनार्थम् । (च.स.शा. 8/32)

विशेषतस्तु गर्भिणी प्रथमद्वितीयतृतीयमासेषु मधुरशीतद्रवप्रायमाहारमुपसेवेत्, विशेषतस्तु तृतीये षष्टिकौदनं पयसा भोजयेत्; चतुर्थे दध्ना पञ्चमे पयसा, षष्ठे सर्पिषा चेत्येके ॥.....

अष्टमे बदरोदकेन बलाऽतिबलाशतपुष्पा-पलल-पयो-दधि-मस्तु-तैल-लवण-मदनफल-मधु-घृत-मिश्रणास्यापयेत्; पुराणपुरीषशुद्धयर्थमनुलोमनार्थं च वायोः, ततः पयोमधुरकषायसिद्धेन तैलेनानुवासयेत्.....! (सु.सं.शा.10/4-5)

मास	आचार्य चरक	आचार्य सुश्रुत
प्रथम	-अनुपस्कृत क्षीर मात्रावत् शीतल करके समय-समय पर पीना -प्रातः-सायं सात्प्य भोजन	मधुर, शीत, द्रवप्राय आहार
द्वितीय	मधुर औषध सिद्ध क्षीर	मधुर, शीत, द्रवप्राय आहार
तृतीय	मधु एवं सर्पि से संस्कारित क्षीर	-मधुर, शीत, द्रवप्राय आहार -षष्टिकौदन दूध के साथ
चतुर्थ	क्षीर-नवनीत अक्षमात्रा में (2 तोला)	-षष्टिकौदन दधि के साथ -पय-नवनीत संसृष्ट आहार -जांगल मांस सहित हृद्य अन्न
पंचम	क्षीर-सर्पि या क्षीरोद्घृत	-षष्टिकौदन दूध के साथ
षष्ठम्	मधुर औषध सिद्ध क्षीर-सर्पि	-क्षीर-सर्पि संसृष्ट अन्न -षष्टिकौदन सर्पि के साथ -श्वदंष्ट्रा (गोक्षुर) सिद्ध सर्पि या यवागू का मात्रावत् पान

सप्तम्	मधुर औषध सिद्ध क्षीर-सर्पि	पृथक्पण्यादि सिद्ध सर्पि (डल्हन-विदारिगन्धादि वर्ग औषधसिद्ध सर्पि)
अष्टम्	<p>-क्षीर, यवागू, सर्पि समय समय पर पान</p> <p>-भद्रकाप्य ने इसके सेवन का निषेध किया है क्योंकि इससे गर्भ में पैंगल्य (पीलापन) आ जाता है।</p> <p>-पुनर्वसु आत्रेय- पैंगल्य बाधा होने पर भी क्षीरयवागू का प्रयोग अकार्य नहीं है।</p> <p>-चक्रपाणि- क्षीर यवागू का प्रयोग अल्पदोषकारक है परन्तु बाद में बहुगुणप्रद एवं लाभदायक होता है।</p>	<p>-पुराण पुरीष शोधनार्थ एवं वायु अनुलोमनार्थ बदर के कषाय में बला, अतिबला, शतपुष्पा, पल्ल, दूध, दही, मस्तु, तैल, लवण, मदनफल, मधु, घृत मिलाकर आस्थापन वस्ति।</p> <p>-दुग्ध एवं मधुरवर्ग के औषधियों के क्वाथ से साधित तैल की अनुवासन वस्ति।</p> <p>-प्रसव काल तक स्निग्ध यवागू एवं जांगल मांसरस सेवन</p>
नवम्	<p>-मधुर वर्ग की औषधियों से सिद्ध तैल की अनुवासन वस्ति</p> <p>-गर्भस्थान और गर्भमार्ग के स्नेहार्थ इसी तैल की पिचु योनि में धारण</p>	—

आचार्य वृद्ध वाग्भट के प्रथम, अष्टम एवं नवम् मास की चर्या को छोड़कर अन्य सभी मास में चरक सदृश ही वर्णन किया है।

प्रथम मास—

प्रथमे मासि गर्भिणि क्षीरमनुपसंस्कृतं मात्रावच्छीतं कालेकाले पिबेत् । तस्मिन्नपि चाद्यं द्वादशरात्रं क्षीरोद्भवं सर्पिः शालिपर्णीपलाशाभ्यां शृतं कनकरजतक्वथितं शीतोदकानुपानं पिबेत् । स्वादु शीतं द्रवप्रायसात्म्यञ्च सायम्प्रातराहारयेत् । न चाभ्यङ्गोद्वर्तनानि सेवेत । यथोक्तानि च दोषकराणि परिहरेदापञ्चमात् मासाद्विशेषेण ॥ (अ.सं.शा. 3/3)

- उपसंस्कृत (औषध आदि के साथ पकाया हुआ) क्षीर मात्रा के अनुसार शीतल, समय-समय पर पीना चाहिए।
- प्रथम मास के प्रथम बारह दिन शालपर्णी के पत्रों द्वारा दूधपाक विधि से कनक या रजत के पात्र में सिद्ध क्षीरोद्घृत का पान करना चाहिए।
- प्रातः-सायं दोनों काल में मधुर, शीतल, द्रवप्राय आहार सात्म्य के अनुसार सेवन।
- अभ्यङ्ग एवं उद्वर्तन का सेवन निषेध किया।
- प्रथम पाँच मास तक दोषकर भावों का त्याग करना चाहिए।

अष्टम् मास—

अष्टमे क्षीरयवागूं सर्पिष्मतीं पिबेत् । नेति खण्डकाप्यः गर्भस्य पैङ्गल्या बाधभयात् । अस्तु पैङ्गल्या बाधस्तथाप्येवं कुर्वीत । नीरुजं बलवर्णसत्त्वसंहननसम्पदुपेत् ज्ञातीनामग्रगण्यमपत्यं जनयतीति भगवानात्रेयः।

.....स्निग्धाभिर्यवागूभिर्जाङ्गलरसैश्चोपाचरेदाप्रसवकालादिति भगवान् धन्वन्तरिः॥ (अ.सं.शा. 3/11)

- क्षीर, यवागू, सर्पि का प्रयोग तथा भद्रकाव्य के स्थान पर 'खण्डकाप्य' नाम का उल्लेख किया है।
- आस्थापन एवं अनुवासन बस्ति का प्रयोग आचार्य सुश्रुतानुसार बताया है।
- गर्भिणी को बस्ति न्युब्ज स्थिति में देनी चाहिए। प्रसवकाल तक स्निग्ध यवागू अथवा जांगल पशु के मांसरस का प्रयोग करना चाहिए।

नवम् मास—

नवमे तु तत एवानुवासनतैलात् पिचुं योनौ प्रणयेद् गर्भमार्गाशययोः स्नेहनार्थमिति ॥

(अ.सं.शा. 3/12)

गर्भमार्ग एवं गर्भाशय स्नेहनार्थ उसी तैल (अष्टमास में अनुवासनार्थ निर्मित तैल) से योनि पिचु धारण करना। वाग्भट ने केवल अष्टम् एवं नवम मास की चर्या का वर्णन किया है—

अष्टम् मास—

क्षीरपेया च पेयाऽत्र सघृताऽन्वासनं घृतम् । मधुरैः साधितं शुद्ध्यै पुराणशकृतस्तथा ॥
शुष्कमूलककोलाम्लकषायेण प्रशस्यते । शताह्वाकल्कितो वस्तिः सतैलघृतसैन्धवः ॥

(अ.ह.शा. 1/64-65)

- क्षीरपेया घृत के साथ पान।
- पुराण मल की शुद्धि हेतु मधुर गण की औषधियों से सिद्ध घृत से अनुवासन बस्ति।
- शुष्क मूली, खट्टे बदर की कषाय, शताह्वा (सौंफ) का कल्क से सिद्ध तैल एवं घृत में सैन्धव मिलाकर बस्ति देना चाहिए।

नवम् मास—

शस्तश्च नवमे मासि स्निग्धो मांसरसौदनः । बहुस्नेहा यवागूर्वा पूर्वोक्तं चानुवासनम् ॥
तत एव पिचुं चास्या योनौ नित्यं निधापयेत् । वातघ्नपत्रभङ्गाम्भः शीतं स्नानेऽन्वहं हितम् ॥
निःस्नेहाङ्गीं न नवमान्मासात्प्रभृति वासयेत् । (अ.ह.शा. 1/67-69)

- स्निग्ध मांसरस ओदन के साथ अथवा प्रचुर स्नेह वाली यवागू उत्तम है।
- पूर्वोक्त अनुवासन भी श्रेष्ठ है। इसी अनुवासन घृत (अष्टम् मास में निर्मित) का पिचु नित्य योनि में रखना चाहिए।
- वातघ्न द्रव्यों के पत्र को कूटकर बनाए गये क्वाथ को शीतल करके स्नान करना चाहिए।
- नवम मास में आरम्भ करके प्रसव तक गर्भिणी को स्नेहरहित अंगो वाली नहीं रखना चाहिए अर्थात् सदैव स्नेहन करना चाहिए।

आचार्य हारीत ने भी प्रथम से दशम मास तक गर्भिणी परिचर्या का वर्णन किया है—

प्रथम मास - यष्टिमधु, परुषक और मधुपुष्प (महुआ) को नवनीत एवं मधु तथा मधुर द्रव्यों से युक्त दूध के साथ पान।

- द्वितीय मास - मधुर काकोली
 तृतीय मास - कृशरा
 चतुर्थ मास - कृतौदन (गला हुआ भात)
 पंचम मास - पायस
 षष्ठम मास - मधुर दहि
 सप्तम मास - घृतखण्ड (घृत + गुड़)
 अष्टम मास - घृतपूरक (घेवर)
 नवम मास - विविध अन्न
 दशम मास - विविध अन्न एवं दौहद इच्छानुसार

आचार्य भेल ने केवल चतुर्थ, पंचम, षष्ठम एवं नवम मास की चर्या का वर्णन किया है-

- चतुर्थ मास - क्षीर नवनीत
 पंचम मास - क्षीर यवागू
 षष्ठम मास - क्षीर सर्पि
 नवम मास - कदम्ब माष तैल की अनुवासन बस्ति, यवागू पान

महत्वपूर्ण- यवागू पान - चरक - 8वें मास

सुश्रुत - 6वें, 8वें, 9वें मास

अष्टांग संग्रह - 8वें मास

अष्टांग हृदय - 9वें मास (पेया पान 8वें मास में)

बस्ति प्रयोग- चरक - 9वें मास, अनुवासन बस्ति

सुश्रुत - 8वें मास, आस्थापन + अनुवासन बस्ति

अष्टांग संग्रह - 8वें मास, आस्थापन + अनुवासन बस्ति

अष्टांग हृदय - 8वें मास, घृत से अनुवासन बस्ति

भेल संहिता - 9वें मास, कदम्ब माष तैल से अनुवासन बस्ति

ड. गर्भिणी के मासानुमासिक पथ्य सेवन से लाभ

परमतो निर्विकारमाप्याय्यामानस्य गर्भस्य मासे मासे कर्मोपदेक्ष्यामः.....यदिदं कर्म प्रायमं.....सुखेनैषा काले प्रजायत इति ॥ (च.स.शा. 8/32)

- प्रत्येक मास के कर्तव्य के पालन से गर्भ विकार रहित होकर सामान्य वृद्धि करता है।
- गर्भधारण एवं प्रसव के समय कुक्षि, कटी, पार्श्व एवं पृष्ठ मृदु हो जाता है।
- वायु का अनुलोमन होता है।
- मूत्र-पुरीष अपने स्वाभाविक रूप में रहते हुए सुखपूर्वक बाहर निकलते हैं।

- चर्म एवं नख मृदु होते हैं।
 - गर्भिणी शरीर में बल एवं वर्ण की उत्तमता होती है।
 - वह गर्भिणी सुखपूर्वक, समय पर, मन के अनुकूल, सर्वगुण सम्पन्न एवं सुखी पुत्र को जन्म देती है।
- एवनाप्याय्यते गर्भः.....।पुराणपुरीषशुद्धयर्थमनुलोमनार्थं च वायोः;..... अनुलोमे हि वायो सुखं प्रसूयते निरुपद्रवा च भवति.....। एवमुपक्रान्ता स्निग्धा बलवती सुखमनुपद्रवा प्रसूयते ॥ (सु.सं.शा.10/4)

आचार्य सुश्रुत ने मासानुमासिक परिचर्या में यत्र-तत्र इसके पालन से लाभ को बताया है—

- गर्भ की वृद्धि होती है।
- पुराण मल का शोधन होता है।
- वायु का अनुमोलन होता है।
- सुखपूर्वक एवं उपद्रवरहित प्रसव होता है।
- गर्भिणी स्निग्ध एवं बलवान् होती है।
- उपद्रवरहित होते हुए सुखपूर्वक प्रसव करती है।

वृद्धवाग्भट ने आचार्य चरक के कथनों को बताते हुए जरायु का स्वाभाविक होकर अपने मार्ग में आना (जरायुद मार्ग प्रतिपद्यते) भी बताया है।

गर्भोपघातकर भाव / गर्भिणी हेतु अपथ्य आहार-विहार

सभी आचार्यों ने गर्भ के विकास में गर्भिणी के आहार विहार के साथ ही मानसिक स्थिति को भी महत्व दिया है। गर्भिणी के द्वारा सेवन किये गये आहार-विहार एवं औषध गर्भ पर सीधा प्रभाव डालते हैं, इसी को ध्यान में रखते हुए गर्भावस्था में आहार-विहार एवं औषध लेने का निर्देश दिया गया है।

गर्भिणी तीक्ष्णौषधव्यवाय व्यायामवर्जनीयानां ।

(च.सं.सू. 24/40, अं.सं.सू. 13/3)

गर्भोपघातकरास्त्वमे भावा भवन्तिः; तद्यथा-सर्वमतिगुरूष्णातीक्ष्णं दारुणाश्च चेष्टाः; इमांश्चान्यानुपदिशन्ति वृद्धाः-देवतारक्षोऽनुचरपरिरक्षणार्थं न रक्तानि वासांसि विभृयान्न मदकराणि मद्यान्यभ्यवहरेन्न यानमधिरोहेन्न मांसमश्नीयात् सर्वेन्द्रियप्रतिकूलांश्च भावान् दूरतः परिवर्जयेत्, यच्चान्यदपि किञ्चित् स्त्रियो विद्युः ॥ (च.सं.सू. 4/18)

तदा प्रभृति व्यवायं व्यायाममर्पणमतिकर्शनं दिवास्वप्नं रात्रिजागरणं शोकं यानारोहणं भयमुकुटुकासनं चैकान्ततः स्नेहादिक्रियां शोणितमोक्षणं चाकाले वेगविधारणं च न सेवेत् ॥

(सु.सं.शा. 3/13)

गर्भिणी प्रथमदिवसात् प्रभृति.....मलिनविकृत हीन गात्राणि न स्पृशेत् न चायात्रयेच्छशरीरं, पूर्वोक्तानि च परिहरेत् । (सु.सं.शा. 10/3)

.....न चाभ्यङ्गोद्धर्तनानि सेवेत । योक्तानि च दोषकराणि परिहरेदापञ्चमान्मासात् ।

(अ.सं.शा. 3/3)

अपथ्य आहार

गर्भिणी स्त्रियों को निम्न आहार का परित्याग करना चाहिए—

- अतिगुरु, अत्युष्ण एवं अतितीक्ष्ण आहार का सेवन
- मदकारक अन्नपान, मद्यपान
- अल्प मात्रा भोजन
- अत्यधिक मांस सेवन
- अतितर्पक एवं अतिरूक्षकर आहार
- शुष्क, आर्द्र, विदग्ध एवं कुत्सित आहार
- विष्टम्भी आहार
- द्विदल, विदाही, अम्ल एवं दग्ध पदार्थों का सेवन
- शीतल जल एवं लशुन का प्रयोग
- उष्णदुग्ध, मृत्तिका, सूरण, पलाण्डू का सेवन
- दूषित एवं विषम अन्न

अपथ्य विहार

गर्भिणी को निम्न विहारों का परित्याग कर देना चाहिए—

- अतिव्यायाम, अतिव्यवाय, वेगविधारण, अतितर्पण, अतिकर्षण, दिवास्वप्न, रात्रिजागरण, कठिनासन, उत्कटासन, यानवहन, चंक्रमण, एकान्त स्थान पर भ्रमण
- क्रोध, भय, शोक, उत्रास एवं उच्च भाषण
- मैले-विकृत-हीन अवयवों का स्पर्श, दुर्गन्धित एवं दुदर्शन पदार्थ
- उद्वेग करने वाली क्रियाएँ
- किसी प्रकार का आघात
- दारुण चेष्टायें
- इन्द्रिय प्रतिकूल भाव
- आतप एवं अग्नि सेवन
- मैथुन
- अधिक हँसना
- बार-बार तैलाभ्यांग तथा उत्सादन का प्रयोग

- भार उठाना, गुरु प्रावरणं (भार ओढ़ना)
- उत्तानशयन, अति मृदु एवं अति उच्च स्थान में शयन या आसन
- क्षीण होते हुए चन्द्रमा तथा अस्त होते हुए सूर्य को देखना
- जल से भरे हुए घड़ों, घृत, माला तथा घृत एवं दही से भरा हुआ पात्र का प्रतिरोध
- लाल रंग के वस्त्र धारण
- गड्ढे या कूएं में झाँकना, प्रपात को बार-बार देखना इत्यादि।

औषधि

गर्भिणी स्त्री को निम्न औषधि या चिकित्साकर्म का परित्याग करना चाहिए—

- तीक्ष्ण औषध सेवन
- रक्तमोक्षण, वमन-विरेचनादि शोधन कर्म तथा बस्ति का अष्टममास तक प्रयोग
- स्नेहन, स्वेदन, क्षारकर्म का प्रयोग।

गर्भोपघातकर भावों के सेवन से हानि

गर्भोपघातकारस्तिवने भावा भवन्ति; तद्यथा उत्कर विषय.....। (च.सं.शा. 8/20)

- गर्भ कुक्षि में ही मर जाता है।
- अकाल में गर्भ स्राव हो जाता है।
- गर्भ गर्भाशय में ही सूख जाता है।
- गर्भ में विकृति उत्पन्न हो जाती है।

गर्भोपघातक भाव	गर्भ में उत्पन्न लक्षण
प्रतत उत्तान शयन	गर्भ के कण्ठ को नाभि आश्रित नाड़ी बाँध देती है।
विवृतशायिनी, नक्तचारिणी	उन्मत्त सन्तान
कलिशील, कलहशील	अपस्मार युक्त सन्तान
व्यवायशील	दुर्वपु (विकृत शरीर वाला), अहीक (निर्लज) स्त्रैण (स्त्री के वश में रहने वाला)
नित्य शोक	भीत (डरपोक), अपचित (कृश), अल्पायु
अभिध्यात्री (नित्य द्रोह)	पर उपतापिन (दूसरे को दुःख देने वाली), इर्ष्यक, स्त्रैण
स्तेन (चोरी करने वाली)	आयास बहुल, अति द्रोहिण, अकर्मशील
अमर्षिणी (क्रोधी)	चण्ड, औपधिक (कपटी), असूयक (परनिन्दक)
नित्य स्वप्नशील	तन्द्रालु, अबुधम् (मुख), अल्पाग्नि युक्त

नित्य मद्य सेवन	पिपासालु, अल्प स्मृति, अनवस्थित चित्त
नित्य गोधामांस सेवन	शर्करा, अश्मरी, शनैर्महयुक्त
नित्य वराहमांस सेवन	चिरनिमेषी, स्तब्धाक्ष
नित्य कुरनित्या	प्रमेह, मूक, अतिस्थूल
नित्य अम्ल रस सेवन	रक्तपित्त, त्वग् रोग, अक्षिरोग
नित्य लवण रस सेवन	शीघ्र वली, पलित, खालित्य रोगी
नित्य कटु रस सेवन	दुर्बल, अल्पशुक्र, अनपत्य
नित्य तिक्त रस सेवन	शोषरोगी, अबली, अनुपचित (कुरुप)
नित्य कषाय रस सेवन	श्याववर्ण, आनाह-उदावर्त पीडित

इस प्रकार गर्भिणी के द्वारा सेवन किए गए आहार-विहार से संबंधित रोगों से पीड़ित सन्तान उत्पन्न होती है।

दोषाभिघातैर्गर्भिण्या यो यो भागः प्रपीडते ।

स स भागः शिशोस्तस्य गर्भस्थस्य प्रपीड्यते ॥ (सु.सं.शा. 3/14)

गर्भिणी द्वारा वर्ज्य आहार-विहार के सेवन से दोष प्रकुपित होकर गर्भिणी के जिस अंग को दूषित करते हैं वही अंग गर्भस्थ शिशु के भी दूषित होते हैं।

वृद्ध वाग्भट ने शारीर स्थान में महर्षि चरक जैसा ही वर्णन किया है।

एभिर्गर्भः स्ववेदामः कुक्षौ शुष्येन्म्रियेत वा ॥ (अ.ह.शा. 1/47)

गर्भिणी द्वारा वर्ज्य आहार-विहार के सेवन से आमगर्भ (तीन मास तक का) का स्राव हो जाता है अथवा गर्भ कुक्षि में सूख जाता है अथवा मर जाता है।

दौहद

द्विहृदयां च नारीं दौहदिनीमाक्षते । (सु.सं.शा. 3/15)

द्विहृदयस्य भावाद् द्वैहृदय्यं, मातृहृदयं गर्भहृदयेन समं हृदयद्वय भवति । (चक्रपाणि, च.शा. 4/16)

द्विहृदय का भाव द्वैहृदय्य है, माता का हृदय गर्भ के हृदय के साथ दो हृदय वाला हो जाता है। अतः गर्भ एवं स्वयं का इस प्रकार दो हृदय वाली होने के कारण गर्भिणी स्त्री दौहदिनी कहलाती है।

सात्म्यं गर्भेण (भर्ज) दौहदम् ॥ (भे.सं.वि. 4/4)

आचार्य भेल ने सात्म्य के द्वारा गर्भज दौहद की परीक्षा का निर्देश दिया है।

दौहद काल

- आचार्य सुश्रुत- चतुर्थ मास
- आचार्य चरक, वाग्भटद्वय, काश्यप ने दौहद उत्पत्ति काल निश्चित नहीं किया है अतः गर्भ वृद्धि के क्रम

में जिस मास के अन्तर्गत दौहद प्रकरण का वर्णन किया है उस मास में दौहद उत्पत्ति काल माना जा सकता है।

- आचार्य चरक के अनुसार जिस काल में इन्द्रियों की स्थिति होती है वह दौहद काल कहा जाता है एवं गर्भ में सर्व इन्द्रियों की उत्पत्ति तीसरे मास में माना है। अतः दौहद की उत्पत्ति तृतीय मास में मानना चाहिए।
- इसी प्रकार वृद्धवाग्भट के अनुसार तृतीय मास में दौहद मानना चाहिए। साथ ही इन्होंने अन्य आचार्य का मत उद्धृत किया है जिससे दौहद काल तीन पक्ष (1 1/2 मास से लेकर चार मास की समाप्ति पाँचवा मास प्रारम्भ) होने तक माना गया है।

- आचार्य वाग्भट - द्वितीय मास
- आचार्य काश्यप - तृतीय मास
- आचार्य हारीत - तृतीय मास
- आचार्य भावमिश्र - चतुर्थ मास

दौहद भाव का प्रादुर्भाव हेतु

तस्य यत्कालमेवेन्द्रियाणि संतिष्ठन्ते, तत्कालमेव चेतसि वेदना निर्बन्धं प्राप्नोति; तस्मात्तदा प्रभृति गर्भः स्पन्दते, प्रार्थयते च जन्मान्तरानुभूतं यत् किञ्चित्; तद्द्वैहृदय्यमाचक्षते वृद्धाः । मातृजं चास्य हृदयं मातृहृदयेनाभिसंबद्धं भवति रसवाहिनीभिः संवाहिनीभिः; तस्मात्तयोस्ताभिर्भक्तिः संस्पन्दते ।

(च.सं.शा. 4/15)

उस गर्भ के शरीर में जिस काल में इन्द्रियों की अभिव्यक्ति होती है उसी काल में गर्भ के मन में वेदना (सुख-दुःख) की अनुभूति होती है इसलिए उसी काल से गर्भ में स्पन्दन क्रिया होती है और गर्भ अनेक जन्म के अनुभूत विषयों की इच्छा करता है, गर्भ की इच्छा माता के हृदय द्वारा व्यक्त होती है। उस काल में माता को द्वैहृदय्य कहते हैं। मातृज होने से गर्भ का हृदय माता के हृदय से रस का संवहन करने वाली रसवाही धमनियों से सम्बन्धित होता है इसलिए दोनों (गर्भ तथा माता) की इच्छा रसवाही धमनियों द्वारा प्रकट होती है।

चतुर्थे सर्वाङ्गप्रत्यङ्गविभागः प्रव्यक्तो भवति, गर्भहृदयप्रव्यक्तिभावाच्चेतनाधातुरभिव्यक्तो भवति, कस्मात् ? तत्स्थानत्वात्, तस्माद्गर्भश्चतुर्थे मास्यभिप्रायमिन्द्रियार्थेषु करोति । (सु.सं.शा. 3/15)

चौथे मास में गर्भ के सभी अङ्ग प्रत्यङ्ग के विभाग स्पष्ट हो जाते हैं और गर्भ का हृदय स्पष्ट होने से चेतना धातु व्यक्त होता है क्योंकि हृदय चेतना धातु का स्थान है। इसीलिए इन्द्रियार्थ (शब्द, स्पर्श, रूप, रस, गन्ध) की अभिलाषा चौथे मास में होती है।

वृद्ध वाग्भट के अनुसार, तृतीय मास में गर्भिणी को चेतना स्पष्ट होने लगती है और इसके बाद से लेकर गर्भ स्पन्दन करने लगता है एवं पाँचों इन्द्रियों के विषयों की अभिलाषा करता है। गर्भ का मातृज भावोत्पन्न हृदय रसवाही धमनियों द्वारा माता के हृदय से जुड़ा होता है इसलिए गर्भ एवं माता दोनों इन धमनियों द्वारा इच्छा उत्पन्न करते हैं। दो हृदय होने पर स्त्री को दौहदिनी कहते हैं।

वाग्भट ने दौहद की उत्पत्ति का कारण, गर्भ का मातृजन्य हृदय का माता के हृदय से सम्बद्ध होना माना है।

आचार्य भावमिश्र ने आचार्य सुश्रुत सदृश ही वर्णन किया है।

दौहद की पूर्ति का परिणाम

तद्यदौहदा हि वीर्यवन्तं चिरायुषं च पुत्रं जनयति । (सु.सं.शा. 3/15)

दौहद की इच्छापूर्ति से स्त्री वीर्यवान् (पराक्रमी) और चिरायु (दीर्घायु) पुत्र को जन्म देती है। इसी तथ्य को आचार्य भावमिश्र एवं टीकाकार अरुणदत्त ने भी माना है।

अतः कामयते सा च तत्तच्छद्याद्विषग्वरः । दौहदादिषु परिपूर्णेणु रूपवान् शूरः पंडितः शीलवान्पुत्रो जायते ॥ (हा.सं.तृतीय स्थान 49/5-10)

महर्षि हारीत ने दौहद की इच्छा पूर्ति का निर्देश दिया है साथ ही बताया है कि दौहद की पूर्ति से रूपवान्, बलवान्, बुद्धिमान एवं शीलवान् पुत्र की उत्पत्ति होती है।

दौहद की अपूर्ति का परिणाम

.....विमानने हस्य दृश्यते विनाशो विकृतिर्वा। (च.सं.शा. 4/15)

सा यद्यदिच्छेत्तत्तदस्यै दद्यादन्यत्र गर्भोपघातकरेभ्यो भावेभ्यः ॥

तीव्रायां तु खलु प्रार्थनायां काममहितमप्यस्यै हितेनोपहितं दद्यात् प्रार्थनाविनयनार्थम् । प्रार्थनासंधारणाद्धि वायुः प्रकुपितोऽन्तःशरीरमनुचरन् गर्भस्यापद्यमानस्य विनाशं वैरूप्यं वा कुर्यात् ॥

(च.सं.शा. 4/17,19)

- दौहद के अपमान या अपूर्ति से गर्भ का नाश या गर्भ में विकृति उत्पन्न हो जाती है।
- द्विहदय्या गर्भिणी जिन इच्छाओं को व्यक्त करती है उन सभी इच्छाओं की यथासम्भव पूर्ति अवश्य करनी चाहिए परन्तु गर्भ को नष्ट करने वाले भावों को छोड़कर।
- यदि गर्भिणी स्त्री किसी गर्भोपघातक भाव की प्रबल इच्छा करती है तो अहित वस्तु को हित वस्तुओं के साथ या कल्पनाओं के द्वारा उसको हित बनाकर देना चाहिए। यदि उसकी इच्छाओं के अनुकूल वस्तुओं की प्राप्ति नहीं होती है तो इच्छाओं को रोकने से कुपित वायु अन्तःशरीर में चलती हुई गर्भाशय को प्राप्त होकर गर्भ का विनाश या गर्भ को कुरूप कर देती है।

गर्भस्य विनाशो विकृतिर्वेति महती इच्छा विघातेन विनाशः, स्वल्पेन तु विकृति.....।

(चक्रपाणि, च.सं.शा. 4/15)

अर्थात् इच्छा के अत्यधिक विनाश से गर्भ का नाश अथवा इच्छा के कम विनाश से गर्भ में विकृति होती है। गर्भ की इच्छा जो माता की इच्छा द्वारा व्यक्त हो उसके विघात से गर्भ का विनाश हो जाता है। माता की इच्छा का अल्प विनाश होने से वह माता में वात प्रकोप करता है और माता और गर्भ का योगक्षेम समान होने से गर्भ में विकृति उत्पन्न हो जाती है।

दौहदविमाननात् कुब्जं कुण्ठं खञ्जं जडं वामनं विकृताक्षमनक्षं वा नारी सुतं जनयति ।

(सु.सं.शा. 3/15)

गर्भो वातप्रकोपेण दौहदे वाऽवमानिते ।
भवेत् कुब्जः कुणिः पङ्गुर्मुको मिन्मिन एव वा ॥

(सु.सं.शा. 2/54)

अलब्धदौहदा गर्भे लभेतात्मनि वा भयम् ॥
येषु येष्विन्द्रियार्थेषु दौहदे वै विमानना ।
प्रजायेत सुतस्यार्त्तिस्तस्मिंस्तस्मिंस्तथेन्द्रिये ॥

(सु.सं.शा. 3/17-18)

दौहद की अवहेलना से स्त्री कुबड़ा, लुला, लंगड़ा, जड़, नाश, विकृतांग या अंधा पुत्र पैदा करती है।

इसी प्रकार वात प्रकोप एवं दौहद की अवमानना से बालक कुबड़ा, लुला, लंगड़ा, गूंगा या मिन्मित (अव्यक्त शब्द का उच्चारण करने वाला) पैदा होता है।

यदि दौहद की प्राप्ति न हो तो स्वयं (माता) या पुत्र पीड़ित होता है। गर्भावस्था के समय जिन इन्द्रियार्थों की पूर्ति नहीं होती गर्भ की उन इन्द्रियों में पीड़ा या दोष उत्पन्न हो जाता है।

.....गर्भस्य विनाशं वैरुष्यं वा कुर्यात्। (अ.सं.शा. 2/20)

वृद्ध वाग्भट् के अनुसार अतितीव्र कामना होने पर अहितकारी वस्तु को भी हितकारी वस्तु में मिलाकर देना चाहिए। दौहद की प्रार्थना पूर्ण न होने के कारण प्रकुपित वायु शरीर के अन्तर गति करता हुआ गर्भ का नाश कर देता है अथवा गर्भ में विरूपता उत्पन्न कर देता है।

श्रद्धाविघाताद्गर्भस्य विकृतिश्च्युतिरेव वा ॥ (अ.ह.शा. 1/59)

श्रद्धा (इच्छा) का विघात होने से गर्भ की विकृत या च्युति (विनाश) हो जाती है।

आचार्य भावमिश्र ने महर्षि सुश्रुत के अनुरूप ही कहा है केवल खंज के स्थान पर "षण्ड" कहा है।

दौहद का कारण

कर्मणा चोदितं जन्तोर्भवितव्यं पुनर्भवेत् ।
यथा तथा दैवयोगाद्दौहदं जनयेद्धृदि ॥ (सु.सं.शा. 3/27)

पूर्व जन्म के कर्म के अनुसार गर्भ में पैदा होने पर जैसा उसका भवित्य होता है, दैवयोग से मन में उसी प्रकार के दौहद की आकांक्षा उत्पन्न होती है।

भावी सन्तान गुण प्रदर्शित करने वाले दौहद

राजसन्दर्शने यस्या दौहदं जायते स्त्रियाः ।
अर्थवन्तं महाभागं कुमारं सा प्रसूयते ॥

अतोऽनुक्तेषु या नारी समभिध्याति दौहदम् ।
शरीराचारशीलैः सा समानं जनयिष्यति ॥

(सु.सं.शा. 3/18-26)

दौहद	उत्पन्न सन्तान गुण
राजा का दर्शन	अर्थवन्त (धनी), महामाग्यशाली
दुकुल-पट्ट-कौशेय भूषण धारण	अलंकारप्रिय, ललित (शृंगार चेष्टा युक्त)
आश्रम निवास	संयतात्म (जितेन्द्रिय), धर्मशील
देवता प्रतिमा दर्शन	पार्षदोपम (देवानुचर तुल्य)
व्यालजाति दर्शन	हिंसाशील
गोधामांस सेवन	सुषुप्सु, धावनात्मक
गोमांस सेवन	बलिन, सर्वक्लेश सहनशील
माहिषमांस सेवन	शूर, रक्ताक्ष, लोमसंयुक्त
वाराह मांस सेवन	स्वप्नालु, शूर
जङ्घाल (हरिण) मांस सेवन	उद्योगी, वेगवान, सदा वनचर
सृमर (शूकर), गवय मांस	विग्नमनस (खिन्न प्रकृति का)
तित्तर मांस	नित्यभीत (डरपोक)

Obstetrical examination

History and physical examination are extremely important to obtain information and is useful to assess the physical status of the patient and arrive at a provisional clinical diagnosis. The main aims are :

- (a) Assess the general condition of the patient,
- (b) Confirm the clinical diagnosis,
- (c) Assess the severity of the disease,
- (d) detect complications.

It is absolutely essential that to explain the patient what examination plan to perform. It must ensure privacy. the presence of a female attendant is a must during examination if obstetrician is a male.

Before starting the examination it must note that the general condition, as to whether the patient is conscious, drowsy or comatose and evaluate orientation to time and place and response to commands. The findings are relevant to patients with eclampsia, shock and postpartum psychosis.

The height and weight reflect to some extent the nutritional status of the patient. Up to 40 per cent of women with a height less than 140 cm may have a generally contracted pelvis. Based on height and weight, calculate the body mass index ($BMI = \text{weight in kg} / \text{height in m}^2$). A BMI of more than 26 is indicative of obesity which may be associated with hypothyroidism, diabetes mellitus or polycystic ovarian syndrome. Obese patients are prone to obstetrical and anesthetic complications. A BMI less than 19 indicates poor nutritional status and may be associated with IUGR.

Serial recording of weight in pregnant mother will help to anticipate pre-eclampsia and IUGR. Must take the patient's weight into account because it may be required to calculate the dosage of certain drugs according to body weight.

After that proceed to note the following :

1. **Facial appearance** : It may reflect underlying diseases like hypothyroidism or systemic lupus erythematosus.
2. **Hydration** : Assessment of hydration is important in cases of hyperemesis gravidarum, prolonged labour or acute abdomen.
3. **Pallor** : Pallor is evident in palpebral conjunctiva skin, and nail bed. Anaemia is mostly due to undernutrition, acute or chronic bleeding.
4. **Jaundice or icterus** : It may be present in cases of severe pre-eclampsia, eclampsia, very severe hyperemesis gravidarum and associated hepatitis.

5. **Cyanosis** : It is seen in cases where cardiac disease complicates pregnancy, status eclampticus or in severe respiratory disorders.
6. **Pulse rate** : It is increased to some degree during pregnancy. A further rise could be due to associated infections or blood loss.
7. **Blood pressure** : Blood pressure should be recorded in a pregnant mother at every visit in order to detect pregnancy induced hypertension (PIH) at the earliest. A reading of 140/90 mmHg, on two occasions, 6 hrs apart is diagnostic of PIH. Another criterion is a rise of 30 mmHg in systolic BP and 15 mmHg in diastolic BP above the baseline values.
8. **Oedema** : Oedema is physiological in approximately 40% of pregnant women. Oedema, which does not subside after a night's rest, is pathological.
9. **Thyromegaly** : It should be looked for especially in adolescent girls with menorrhagia or among women with infertility and recurrent abortions.
10. **Temperature** : A rise in temperature is an important sign of underlying infection, especially of the urinary tract during pregnancy and acute pelvic inflammatory disease.

Systemic Examination

In pregnant women, must examine the following :

1. **Cardiovascular system** : A functional systolic murmur is associated with anaemia. In India, the commonest heart disease complicating pregnancy is rheumatic in origin and affects the valves. With surgical intervention widely available, many girls with congenital heart disease reach the reproductive age group.
2. **Respiratory system** : Bronchial asthma, pulmonary tuberculosis are commonly encountered and should be looked for.
3. **Musculo skeletal system** : Any deformity in the spine or the hip joint influence the pelvic architecture and capacity. Lower limb/limbs affected by polio is a case in point.
4. **Central nervous system** : It is important to look for any neurological deficit.

Examination of Breasts

In a pregnant woman, look for changes suggestive of pregnancy like:

- Increase in size and vascularity.
- Montgomery's tubercles : There are nodules in the areolar region.
- Darkening of the areola and pigmentation around the areola, which is called as secondary areola.
- Nipples are protractile.
- Retraction of nipples: If present, an attempt should be made to correct the retraction.

If not corrected, it is likely to give rise to feeding difficulties and subsequently to engorgement of the breasts.

Whenever a woman comes to us, whether she is pregnant or not, a systematic examination, with a view to detect any lump, is mandatory.

To proceed the examination of the breasts according to the steps described below, after ensuring privacy—

i) **Inspection:** Inspection is carried out in the following positions:

- Sitting with arms by the side
- Leaning forward at 45°
- Hyperabducting the arms
- Supine with a thin, soft pillow under the ipsilateral breast.

The advantages of examining in these positions are: Leaning forward demonstrates tethering to the underlying muscle or chest wall. Hyperabduction demonstrates tethering of skin or "Peau d'orange" which may not otherwise be appreciated. The last position is the best for palpation.

ii) **Palpation:** Palpate the uninvolved breast, first with the palmar surface of the fingers, for detecting lumpiness or lumps and then with the pulp of thumb and fingers for a detailed assessment. To palpate the central segment and all four quadrants including axillary tail. Always proceed from periphery to the centre to note whether any nipple discharge is produced.

One should must note the following points while palpating :

- Tenderness and rise in temperature are characteristic of inflammatory swelling
- Whether the whole breast is involved
- Diffuse nodularity is characteristic of fibroadenosis
- When a lump is felt, make a note of the shape and the margins
- Consistency is hard in case of carcinoma, fibroadenomas are firm
- Fixity to underlying tissue is suggestive of malignancy
- Lymph nodes: Anterior axillary nodes are best felt with the fingers behind pectoral muscles and the thumb in front. Central axillary nodes are felt by inserting the hand as high as possible in the axilla and moving the palmar surface of the fingers downward, along the chest wall. Posterior axillary nodes are felt from behind the patient with the fingers in front of the posterior axillary fold and the thumb behind it. The supraclavicular nodes are felt from behind the patient by inserting the fingers behind the clavicle and rolling the tissues of the first rib.

Examination of the Abdomen

Examination of the abdomen is an integral part of examination. We will first deal with examination in general and then as related to pregnancy.

General

To explain the patient the nature of the examination and instruct her to empty the bladder, so that a full bladder does not vitiate the physical findings. Ask her to be in the dorsal position with lower limbs extended. Expose the whole abdomen, taking care to cover the patient above the xiphisternum and below the upper half of thighs.

Inspection : A note must be made about presence of striae gravidarum, linea nigra or scars of previous surgery. Ask her to cough in order to detect incisional hernia if a scar is present; to look for hernia in the umbilical and inguinal regions. Also make a note of the presence of any skin lesions, infective or vascular.

Find that the umbilicus is normally situated between the tip of the xiphoid process and the upper margin of symphysis pubis. It can be displaced by ascites or intra abdominal tumour.

The contour of the abdomen is generally retracted in a thin individual. Distension or tumour of an organ leads to localized distension of the abdomen. Symmetrical distension could be due to fat, fluid, flatus, faeces and foetus. Multiple pregnancy, pregnancy with polyhydramnios or a very large ovarian cyst could cause an over-distended abdomen.

Palpation : The patient's lower limbs should be semiflexed at the hip and knee joints and ask the patient to breathe quietly. Must reassure the patient and perform the palpation gently, starting from an area where the patient has no pain.

Palpate gently using firm pressure with fingers almost straight with slight flexion at the metacarpo phalangeal joints. Palpate all the quadrants of the abdomen, looking for liver, gall bladder and spleen in the upper quadrants. An enlarged uterus (pregnancy/tumour) or a mass arising from ovaries should be looked for in the lower quadrants.

A uterine mass occupies the hypogastrium and is mobile in the horizontal axis. An ovarian tumor is usually cystic and could be moved in both, vertical (above downwards) and horizontal axes. However, large ovarian cysts, which occupy the whole abdomen, may arise confusion with ascites. In order to differentiate one from the other, proceed to percuss with the patient in supine position. The note is resonant in the centre and dull in the flanks in case of ascites; it is dull in the centre and resonant in the flanks in case of ovarian tumours.

Obstetric

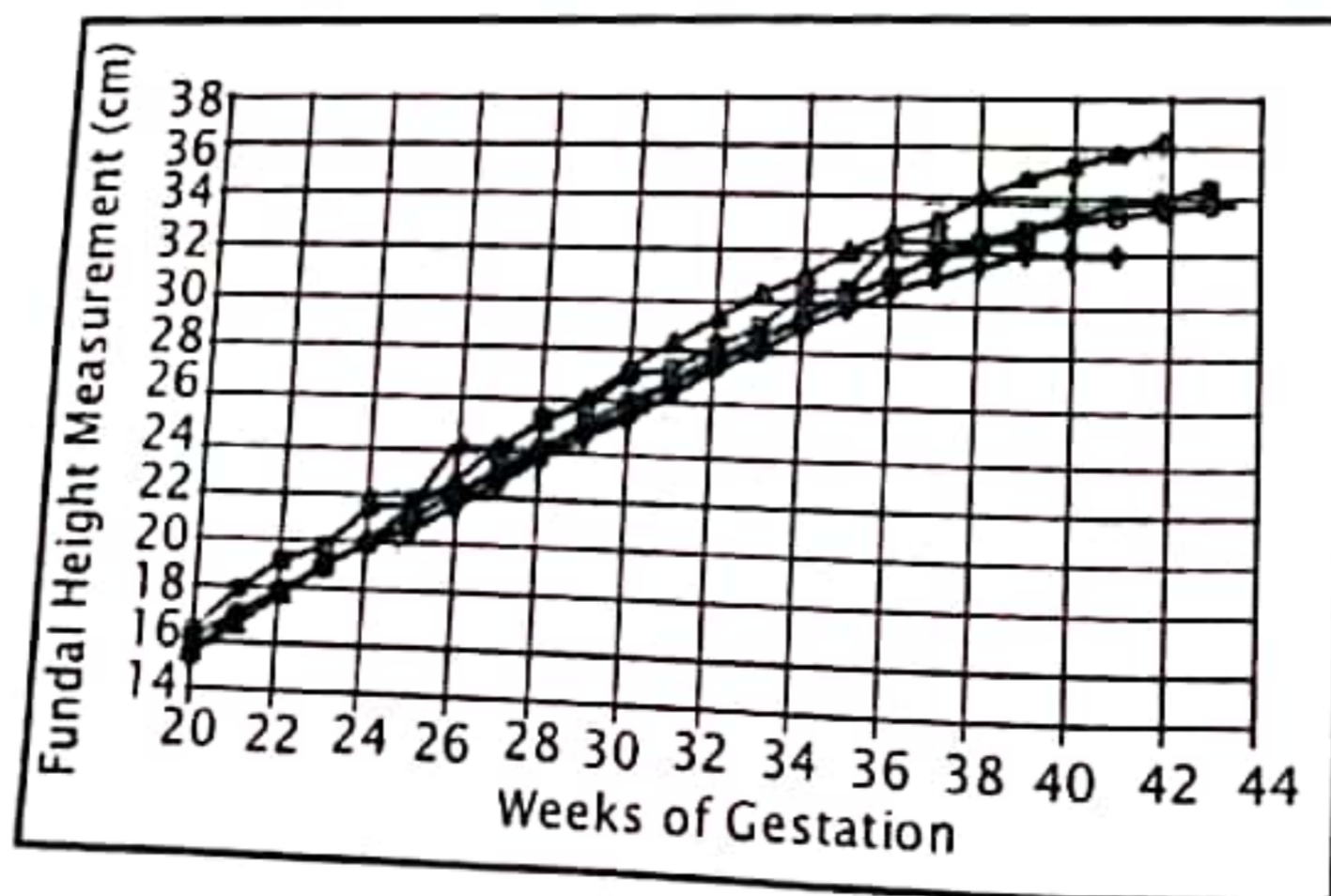
The objectives of obstetrical palpation are as follows:

- To assess the period of gestation
- To detect the lie of the foetus
- To ascertain the attitude of the foetus
- To find out the position of the foetus
- To assess the level of the presenting part in relation to the pelvic brim
- To evaluate the foetal size
- To evaluate foetal wellbeing by listening to heart sound
- To detect uterine contractions

Instruct the pregnant woman to void urine and lie down in dorsal position with lower limbs partially flexed. Explain the procedure and expose the abdomen as described earlier. Examiner stand close to the examining couch, on the right side of the pregnant woman. Note the contour of the uterine ovoid to see whether it is parallel to the long axis of the mother as in longitudinal lie or perpendicular as in transverse lie.

Steps

- Using the ulnar border of the left hand, palpate the fundus of the uterus and pass the hand from above downwards till resistance is felt (uterine fundus is palpable). Right hand will correct dextro rotation if present.
- Conventionally, the uterus is first palpable at 12 weeks; it is at the umbilicus at 24 weeks and at the xiphisternum at 36 weeks. The distance between the symphysis pubis and the umbilicus is divided into three parts, marking 16, 20 and 24 weeks of gestation. The distance between the umbilicus and the xiphisternum is divided into three parts making 28, 32 and 36 weeks of gestation. At term the fundal height comes down to the level of 32 weeks and there is fullness in the flanks.

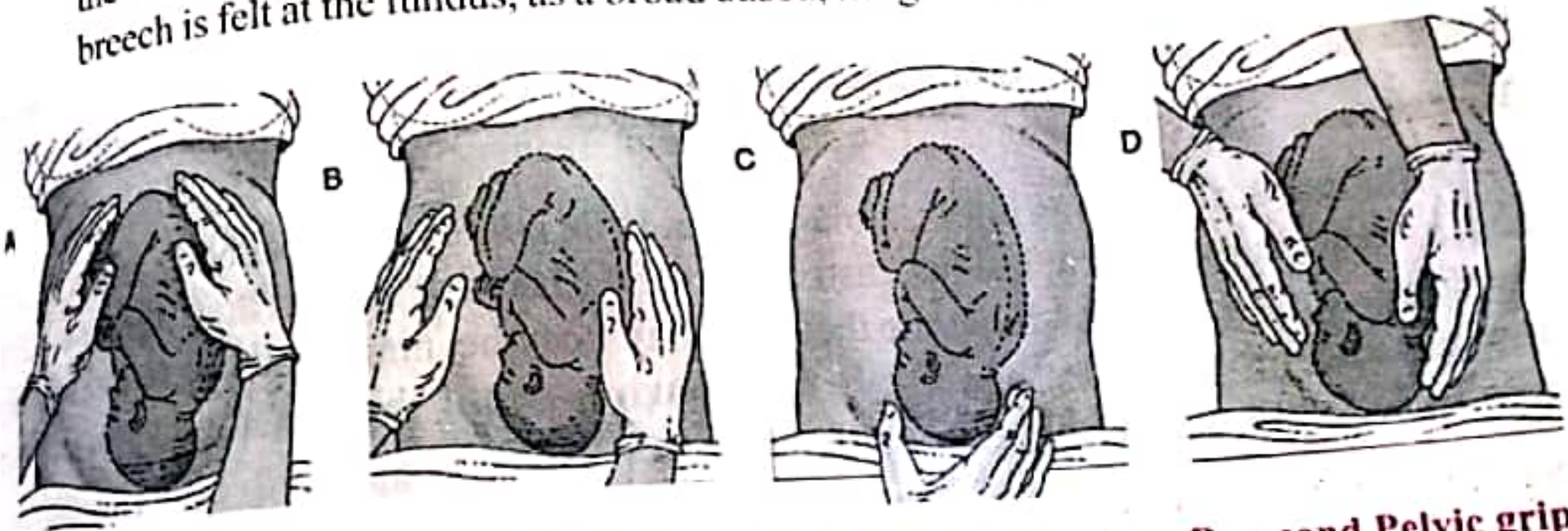


Gravidogram

A more objective method of recording fundal height is to measure the symphysiofundal height (SFH). After palpation of the fundus, it should be preferably marked. The pregnant woman is then asked to extend the lower limbs; the distance from the upper margin of the symphysis pubis to the fundal height is measured in centimeters. The value of SFH at each antenatal visit is plotted on a gravidogram in order to monitor the foetal growth. If measurements fall below the 50th percentile, must suspect IUGR and order for investigations to assess foetal growth and well being.

Obstetric grips

A. Fundal grip : Examiner must face the pregnant woman and place both his hands on the uterine fundus and try to feel the breech or the head. In cephalic presentation, the breech is felt at the fundus, as a broad based, irregular non-ballotable mass.



- A. Fundal grip,** **B. Lateral or Umbilical grip,** **C. First Pelvic grip,** **D. second Pelvic grip**
- B. Lateral or umbilical grip:** After the fundal grip, the hands pass on the flanks, on either side of the umbilicus. One hand steadies the foetus while the other hand palpates. In longitudinal lie, the smooth curve of the back is felt on one side, while irregular limb knobs are felt on the opposite side.
- C. First pelvic grip :** Examine must next place his right thumb and forefinger over the lower pole of the uterus with the ulnar border on the symphysis pubis. The presenting part is grasped and moved side to side. In cephalic presentation, the head is felt as a hard globular, non-ballotable mass. This grip helps to recognize whether the head is engaged or not.
- D. Second pelvic grip or Pawlik grip :** Examiner will now face the feet of the pregnant woman. Placing either hand on the lower abdomen, parallel to the inguinal ligament, palpate the cephalic pole and feel the occiput and the sinciput. The occiput is felt as a broad and smooth prominence felt on the same side as the back of the foetus, as compared to the sinciput, which is smaller and sharper. In a well-flexed head the

sinciput is felt at a higher level than the occiput; when the head is deflexed both are at the same level and in an extended head the occiput is at a higher level.

Auscultation : Now auscultate the foetal heart sounds. They are best heard at the junction of the lateral third and medial two thirds of a line joining the umbilicus and the anterior superior iliac spine, in a vertex anterior position, on the side of the back of the foetus. In an occipito posterior position, they are heard in the flanks or in the midline. In a breech presentation, they are heard at level of umbilicus.

Pelvic Examination

As instructed earlier, to ensure the presence of female attendant and adequate lighting, explain the procedure to the patient and advise her to lie in dorsal position with complete flexion at hip and knee. Gloves must put in both hand for pelvic examination.

The components of pelvic examination consist of inspection of the external genitalia, vagina and the cervix and a bimanual pelvic examination.

Inspection

First inspect the mons pubis, labia majora, labia minora, perineal body and the anal region to the contour, skin lesions, distribution of the hair and any swelling. If there is any swelling, must palpate it. Separate the labia to inspect the introitus, the external urinary meatus and the clitoris; then ask her to cough to see if there is any cystocoele or retocoele. Note any discharge from the introitus.

Speculum Examination

The patient can continue to be in dorsal position or may be shifted to left lateral position. After informing the patient, take a moistened speculum in right hand (left hand in case of a left hander), and using the index finger and the thumb of the left hand, separate



Cervical OS
Bleeding through
cervical opening
Speculum



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the labia and insert the speculum into the vagina with the blade in an oblique direction and rotate it gently to the transverse plane on the posterior vagina wall. Then adjust the position of the speculum till getting a good view of the cervix and the vagina.

The purpose of this examination is to look for the following:

- Presence of abnormal discharge or blood
- Bluish discolouration of the cervix and vagina, so characteristic of pregnancy
- Lesions on the cervix and/or the vagina which could be infective, neoplastic, traumatic or congenital in etiology.

Bimanual Pelvic Examination

Place one hand on the lower abdomen and the lubricated index and middle finger of the other hand are inserted in the vagina. Keep the examining fingers away from the clitoris and the urinary meatus to avoid discomfort to the patient, exert pressure on the perineal body until the perineal muscles are relaxed. Continue advancing along the posterior vaginal wall. Hand on the lower abdomen must exert a gentle, downward pressure, so that the pelvic organs are brought closer to the fingers in the vagina.

Identify the cervix by a dimple, which is the external os and note its length, consistency and direction. The cervix is normally 2.5-3 cm in length and firm in consistency. During pregnancy, the cervix is soft. Generally the os is directed posteriorly towards the sacrum and the uterus is anteverted and ante-flexed. However, in some women the os is directed anteriorly and the uterus is retroverted and retroflexed. Retroversion of the uterus is not abnormal unless its mobility is restricted. The cervix is normally mobile by 1 cm. in all directions; tenderness on movement is elicited in case of pelvic inflammatory disease (PID) and ruptured ectopic pregnancy.

Further note the size, shape, regularity and consistency of the uterus. A non-pregnant uterus is firm in consistency. During pregnancy the uterus is uniformly enlarged and soft. At 8-10 weeks of gestation, the products of conception are lodged near the fundus and the isthmus is extremely soft with the result that examiner's fingers in the vagina seem to meet fingers on the abdomen. The uterus is firm and irregularly enlarged in the presence of fibroids.

Place the fingers in the right lateral fornix, while the abdominal hand on the right lower quadrant exerts downward pressure. Then repeat the examination on the left side. Now explore the posterior fornix for the presence of a mass or nodules.



Bimanual Palpation of uterus

Examination in Late Pregnancy and Labour

The objectives of performing a bimanual examination in late pregnancy are to:

- Confirm the presenting part; vertex (occipito-anterior/posterior position), face or breech
- Diagnose labour
- Assess pelvis and cephalopelvic disproportion
- Monitor labour

In per vaginal examination, the following findings help us to make a diagnosis of labour:

- Presence of 'show'
- Effacement of the cervix and dilatation of the os.
- Presence of bag of membranes

In order to assess the pelvic capacity, advance the fingers and try to reach the sacral promontory. The diagonal conjugate can be measured (from the tip of middle finger to a point which touches symphysis pubis) and the anteroposterior diameter of the pelvic inlet is obtained by subtracting 1.5 to 2 cm. The next movement is to sweep the fingers down the sacrum to assess the curvature from above downwards and from side to side. Note the convergence of the side walls, exaggerated convergence, prominent ischial spines, decreased distance between the ischial spines and a decreased width of the sacrosciatic notch point to a mid-pelvic contraction. Assess the sub pubic arch, which is normally rounded. The intertuberos diameter is considered adequate if examiner is able to place his clenched hand between the ischial tuberosities; the intertuberos diameter in an average pelvis measures 11 cm.

Then must note the station of the presenting part in relation to ischial spines.

Bimanual examination is useful in monitoring the progress of labour by assessing progressive dilatation of the cervix and descent of the presenting part.

Antenatal care (ANC)

Antenatal Care : Antenatal care is systematic medical supervision including examination and advice to a pregnant woman with the aim to ensure that every wanted pregnancy culminates in the delivery of a healthy baby without impairing the health of the mother. Ideally this care should begin soon after conception and continue throughout the pregnancy.

In India, antenatal clinics were instituted in the 1940's. The Ministry of Health and Family Welfare has recommended minimal antenatal care i.e. 3 visits of which 2 should be in the last trimester, third being within last 4 weeks before term. It is hoped that such care will reduce considerably both maternal and perinatal mortality.

Need for Antenatal Care

It is extremely important to be aware that in India over 95%, of maternal deaths occur among women who have never had ANC. In spite of all efforts, 12% in the rural areas receive ANC. The maternal mortality in our country ranges from 100/1,00,000 in Kerala to 1200 to 1500/ 1,00,000 in the Northern States with an average of 400/1,00,000. About 30% of the babies are of low birth weight and perinatal mortality is in the range of 70-80/1,000. Unfortunately the leading causes of this grim outcome continue to be infections, haemorrhage, anaemia and pre-eclampsia which can be prevented if we institute 'Intelligent antenatal care'.

Objectives of Antenatal Care

Many of our women come to the hospital only when they are in labour; good intranatal care no doubt prevents maternal and neonatal mortality and morbidity to some extent, but care during pregnancy (ANC) can help us to detect/anticipate complications which if taken care, can further improve both maternal and foetal outcome.

Therefore, the objectives of antenatal care are to :

- 1) Confirm pregnancy and Expected Date of Delivery (EDD)
- 2) Monitor maternal health
- 3) Monitor foetal health
- 4) Identify high risk pregnancies
- 5) Detect associated medical, surgical and gynaecological disorders
- 6) Recognise the deviation from the normal
- 7) Screen for infections
- 8) Select cases for domiciliary/hospital delivery

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- 9) Immunise the pregnant mother against tetanus and other diseases
- 10) Educate the mother regarding nutrition and drugs
- 11) Educate the mother regarding child care and exclusive breast feeding
- 12) Counsel her about contraception.

Number and timing of antenatal visits

Number of visit	Timing of visit
1st visit	Within 16 weeks
2nd visit	Between 14-26 weeks below 24-28 weeks
3rd visit	at 32 weeks
4th visit	at 36 weeks

WHO new guidelines on antenatal care for a positive pregnancy experience

As per WHO, the new guidance increases the number of contacts a pregnant woman has with health providers throughout her pregnancy from four to eight. Recent evidence indicates that a higher frequency of antenatal contacts by women and adolescent girls with a health provider is associated with a reduced likelihood of stillbirths. Eight or more contacts for antenatal care can reduce perinatal deaths by upto 8 per 1000 births when compared to 4 visits. It recommends pregnant women to have their first contact in the first 12 weeks gestation, with subsequent contacts taking place at 20, 26, 30, 34, 36, 38 and 40 weeks gestation.

Sample recommendations include

Antenatal care model with a minimum of eight contacts recommended to reduce perinatal mortality and improve women's experience of care.

Counselling about healthy eating and keeping physically active during pregnancy.

Daily oral iron and folic acid supplementation with 30 mg to 60 mg of elemental iron and 400 mg (0.4 mg) folic acid for pregnant women to prevent maternal anaemia, puerperal sepsis, low birth weight, and preterm birth.

Tetanus toxoid vaccination is recommended for all pregnant women, depending on previous tetanus vaccination exposure, to prevent neonatal mortality from tetanus.

One ultrasound scan before 24 weeks gestation (early ultrasound) is recommended for pregnant women to estimate gestational age, improve detection of fetal anomalies and multiple pregnancies, reduce induction of labour for post-term pregnancy, and improve a woman's pregnancy experience.

Health-care providers should ask all pregnant women about their use of alcohol and

other substances (past and present) as early as possible in the pregnancy and at every antenatal visit.

Antenatal Examination and Test

Routine Tests during Pregnancy

CBC : A complete blood count gives information regarding leucocyte and erythrocyte levels and plasma volume ratio. If leucocyte are high, infection may be present and thus can be treated early. If the erythrocyte count is low or haemoglobin and hemotocrit levels are low, anaemia may be a problem.

Blood Type and Rh : Blood type of Rh is important for prevention or treatment of erythroblastosis in the foetus. If the mother is Rh -ve and unsensitized, preventive Rh immuno-globulin should be given at 28th week.

Antibody Screen : Screening should be done regardless of the Rh type because other haemolytic incompatibilities may be present.

Rubella Screen : A Rubella screen gives information about immunity against the disease rubella (rubella antibody time). This test is not done as a routine.

VDRL and ELISA : A serology test to screen for syphilis should be done on all women because this has implications for the treatment of the mother and for potential congenital syphilis in the foetus caused by maternal infection. HIV test is compulsory for all the pregnant women.

Blood Sugar : Blood sugar must be evaluated if the family history is strongly positive for diabetes or if the woman is over 35 years age. Both fasting and post-prandial blood sugar must be estimated. One hour past glucose blood sugar estimation for patients at high risk for diabetes at 28th week of gestation, as indicated by:

- Family history of diabetes
- Maternal age > 35 yrs.

Urine Analysis : Routine examination of urine for presence of sugar, albumin must be done during each visit of the mother to the antenatal clinic.

Urine analysis and culture and sensitivity of the urine can offer information about renal function and urinary tract infection. If renal function is the question, further evaluation for creatinine, protein, and uric acid may be done of the urine and serum.

Papanicolau Smear : A pap smear should be done on all pregnant women at the time of their first prenatal visit if one has not been done in the previous year. In presence of cervical cancer, pregnancy might need to be terminated for the treatment of the mother.

Other tests such as mantoux, G₆PD deficiency, thalassaemia etc. is done in selected cases when indicated.

History Taking in Pregnancy

The purpose of taking history is not merely for recording facts and statistics. It is a vital means of assessing the health of the woman and bringing to light any defect/deficit which would adversely affect child bearing. History taking also should lead to taking remedial action as far as possible.

The obstetrician need to develop great patience and tact in taking history of a new patient especially a primigravida to whom pregnancy may seem to be an ordeal. As far as possible non-technical terms should be used, and questions should be asked in such a way as to avoid waiting tension or fear in the pregnant woman.

Family History

This should be enquired into since some families have a genetic predisposition to certain diseases such as psycia disorders, diabetes, essential hypertension, twins etc.

Medical History

Since former illnesses may damage certain organs, structures which may effect pregnancy, labour. So it is essential to enquire about her previous health. Diseases like diabetes, hypertension, tuberculosis of spine and hip, epilepsy and psychiatric disorder should be enquired into. History about taking blood transfusion. Major medical complications such as diabetes and cardiac conditions require the involvement and support of the medical team.

Surgical History

It gives information about any surgery that has been done on her like heart surgery, kidney surgery or gallbladder surgery or caesarean section.

Menstrual History

Menarche and duration of menstrual flow, cycle regular/irregular. When was the first day of the last normal menstrual period (LMP). Expected date of delivery (EDD) is calculated by adding 9 calendar months and 7 days to first day of last normal menstrual period.

Obstetrical History

After taking history, know whether the woman is primigravida or primipara and how many living children she is having, their health status, age and sex.

Past obstetrical history is very important, know about any bad obstetrical history like:

- Stillbirth or neonatal death
- Baby small or large for gestational age
- Congenital abnormality
- Rhesus immunisation
- Pregnancy-induced hypertension
- Two or more termination of pregnancy
- Spontaneous abortion twice or more
- Premature labour
- Previous caesarean section
- Antepartum or postpartum haemorrhage
- Contraceptive history
- Any high risk pregnancy, hospital/home
- Alive/dead children
- Causes of death

General Examination

General examination is done for assessment of risk. This may be done in an organized and standardized form, do assessment and write all the findings. Head to toe examination is done. Weight and blood pressure should be taken in every general examination and the should be look at the woman's face then progress downwards to finish with an inspection of her legs and feet. Minor disorder of pregnancy can be detected during examination. Examine breast also for cracked and inverted nipple. Blood pressure is taken in order to ascertain normalcy while doing general examination.

Ask women about normal bowel habit. Dietary advice may be necessary during the visit.

Obstetrical Examination

Examine the women to find out about the progress of pregnancy, diagnosis, any risk factors so that proper steps can be taken to reduce the risk.

Aims

It should be done to:

- Observe signs of pregnancy
- Assess foetal size and growth
- Assess foetal health
- Diagnose the location of the foetal parts

The steps of abdominal examination consist of :

a) **Inspection** : By inspection, we know the size of the abdomen and stretch marks or striae, and linea nigra and any surgery scar.

b) **Palpation** : Uterine fundus is palpated at each check up to corroborate normal foetal growth as :

14th week – 2.5 cm above symphysis pubis

18th week – 4 cm below umbilicus

24th week – At level of maternal umbilicus

28th week – At lower 1/3rd distance between umbilicus and ensiform cartilage

32nd week – At lower 2/3rd distance between umbilicus and ensiform cartilage

36th week – reaches below sub costal arch.

40th week – comes lower below 36th week but lies above 32nd week.

- Palpation of fundal height and measurement of symphysiofundal height.

- Obstetrical grips :

- Fundal grip

- Lateral grip or umbilical grip

- First pelvic grip

- Second pelvic grip or Powlik's grip

Auscultation: Foetal heart sound is heard by stethoscope at the site of foetal back on the spino-umbilical line or on the flanks in vertex presentation. Foetal heart rate heard at 120-140/min ensures foetal well-being.

Antenatal Advices

An obstetrician will examine, advise, supervise and attend a pregnant woman:

- To help her maintain good health and where applicable, early detection and treatment of abnormalities.
- Undergo a pleasant child-bearing experience and adequate preparation for labour and lactation.
- Give birth to an alive, healthy baby at the end of pregnancy.

Antenatal care should commence once pregnancy is diagnosed and should continue until the safe delivery of the patient. In India, women, sometimes do not attend the clinic advise their husbands and relatives to understand the necessity and value of early antenatal care. Women should be encouraged to attend the antenatal clinic early at least

4 times throughout pregnancy. 1st visit is within 16 weeks and 2nd visit at 24-28 weeks of pregnancy and 3rd visit in 32 weeks of pregnancy and 4th visit at 36 weeks of pregnancy.

Nutrition in Pregnancy

Malnutrition, which is common in our country, may become worse in pregnancy when the needs of the growing foetus further deplete the maternal stores of nutrients. The obstetrician should always advise that daily intake of protein, vitamins and mineral salts is necessary to provide for the needs of the growing foetus and prevent anaemia in the mother. The daily requirement of calories in a pregnant woman is 2500k cal (2200k cal is non-pregnant woman). A pregnant woman needs an ample amount of protein daily. About 80-90g of protein has been recommended as the minimum daily requirement of a pregnant woman. Advise the woman to take protein rich diet such as liver, meat, eggs, fish, chicken, cheese and, milk, bean, ground nut, pulses. Carbohydrate and fat should be included in the daily diet.

Vitamins and Mineral Salts : The most important vitamins during pregnancy are vitamins A, B, C and D. So advise pregnant woman to take these vitamins. She should take eggs, meat, liver, green vegetables and wheat as vitamin B complex is essential for carbohydrates metabolism and prevention of anaemia.

Vitamin D : It is necessary for normal formation of bones. It is found in egg yolk, fatty fish, cheese and milk. The richest source of Vitamin D in the tropics is sunshine. Vitamins are mainly found in fresh fruits and vegetables. Therefore, a woman should take fresh fruits and vegetables. A pregnant woman should take more fluid.

Folic Acid : The daily requirement is about 0.5-1.0 mg. It can be easily provided in the diet by consumption of green leafy vegetables, cereals and pulses.

Calcium : The recommended calcium requirement is 1000-1200 mg/day.

Iron : Anaemia is very common during pregnancy. It may be due to repeated pregnancy or iron deficiency. Many women embark on a pregnancy with depleted iron stores due to heavy earlier menstrual losses, or rapid successive pregnancies. The demand of the growing maternal tissues and the foetus further contribute to the deficiency state.

In present day practice, it is accepted that all pregnant women should be advised supplemental oral iron daily containing 30-60 mg. While giving iron, the women must be advised that it should be given in between meal and should not be given in tea for proper absorption.

Antenatal Rest and Work

Adequate rest and sleep are very important for the maintenance of good health. Pregnant women should sleep for 8 hours at night in an airy room. If there is anxiety or any pain, women should sleep for more hours. The women should take rest in the afternoon or relax quietly in a comfortable position for about one to two hours. She can do light work but not to lift heavy things. High heeled shoes should not be used because they make the patient lean forward. They also cause lower abdominal discomfort and fatigue.

Exercise and Recreation

Exercise and recreation is very important during pregnancy. Pregnant woman should not be upset. She may have fear of labour or any complication of pregnancy. It is also unsafe for a pregnant woman to undertake long strenuous journeys towards the end of her pregnancy. Moderate exercise, particularly in the open air is beneficial. Healthy women may undertake exercise to which they are accustomed. Ordinary housework should be done but not lifting or pulling any heavy articles. Breathing exercises are performed during the last eight weeks of pregnancy. Slow, continuous, deep breathing is done with a relaxed abdominal wall.

Personal Hygiene

Pregnant women have to take bath daily because the skin is more active during pregnancy. She should clean her teeth daily so as to keep them in good condition. The clothing should be clean, loose and of cotton material.

A daily bath or shower is necessary because the sweat and sebaceous glands are more active. Tub bath should be avoided particularly in the last two months. While taking bath, she should take care of her breast, as care of breast promotes successful breast-feeding. Particular attention to the nipple is to be encouraged. The areola should be thoroughly washed with the soft cloth and soap. Each nipple should be pulled out and rolled between the fingers about three times daily to make it more projectile. In the last trimester, colostrum should be expressed from the breast in order to keep the duct clear. The undergarments should be adjustable so that it fits the patient throughout the duration of pregnancy. Bowels must be moved daily. Dental caries and septic foci must be treated during pregnancy.

Coitus

Sexual intercourse is not harmful but it should be avoided during first and last trimester. Teaching is to be given about sexual relationship. Sexual expression during pregnancy is affected by physical, emotional and interactional factors.

Special Teaching

Feelings of anxiety are common to all pregnant women and common problems in pregnancy leads to anxiety. Health teaching is to be given for various reasons because if pregnancy is increased irritability, explosions of tears and anger, or feeling of great joy and cheerfulness alternate with little or no provocation.

Explain the pregnant women about birth process and labour pain. In each case any complication like antepartum haemorrhage, placenta praevia or early rupture of membranes then inform doctor immediately. Women should be instructed to report immediately if any of the following symptoms is experienced:

- Vaginal bleeding
- Puffiness of face or tightness of rings
- Severe or continuous headache
- Blurring or dimness of vision, double vision or spots before the eyes
- Dizziness or fainting spells
- Acute persistent abdominal pain
- Persistent vomiting
- Chill or fever
- Dysuria

The pregnant woman should be advised not to take any medicine unless it is prescribed by doctor. As far as possible, medicine should be avoided for the first 3 months unless very essential. Pregnant woman must inform the doctor about pregnancy when seeking any treatment from doctor.

Teach mother for delivery and lactation. If mother want to have confinement, teach the mother accordingly.

Advise her to check foetal movement, any vaginal bleeding etc.

Travel

Travelling is allowed in the second trimester but as a whole travelling should be avoided. With a history of recurrent abortions or pre-term deliveries, travelling should be avoided at the gestational age. Sometimes morning sickness is further complicated by motion sickness during travel. Air travel poses the risk of hypoxia due to high altitude. Air travel should not be undertaken after 32 completed weeks of pregnancy for fear of onset of labour during travel.

Psychological Care in Pregnancy

The addition of a new baby to the family affects not only the mother but also the father. So both the parents should be encouraged to learn about their baby. The husband

is the best person to support the woman during pregnancy and labour. The change in body size and shape raises certain anxieties. Some women feel their self image is affected by society's standards of beauty. Women may be concerned that she is no longer attractive to her partner; weight gain and increase in size are not the only issues in the sense of decreased attractiveness.

Other body changes may also contribute to the sense of loss of physical appearance.

Family planning

Family planning is related to every phase of maternity cycle educational and motivational efforts must be initiated during the antenatal period. If mother has two or more children she should be motivated for puerperal sterilisation. The mother should be educated and motivated for small family and spacing of children.

Antenatal Assessment of Foetal Well-Being

A foetal growth assessment is typically performed in the late second and the third trimester of pregnancy to ensure delivery of healthy neonate.

The aim of this examination is to assess:

- The foetal heart activity and rhythm
- The presentation of the foetus (ie head, breech, transverse)
- The foetal size and growth pattern
- The amount of amniotic fluid around the foetus
- The position of the placenta
- The blood flow through the umbilical artery when indicated (and blood flow within the foetal brain or liver if necessary)
- The activity and behaviour of the foetus.
- The length of the cervix
- The presence and position of any uterine fibroids

Benefits of foetal wellbeing assessments

- Early detection of foetuses at risk to prevent perinatal mortality and morbidity.
- Find out normal foetuses and avoid unwarranted interventions.

Methods

1. (a) Clinical assessments

- Weight gain
- Fundal height
- Abdominal girth

- Auscultation of foetal heart
- (b) foetal movement count by mother
- 2. Ultrasound for foetal parameters
- 3. Biochemical tests
- 4. NST
- 5. VAST
- 6. CST
- 7. Nipple stimulation test
- 8. Biophysical profile
- 9. Doppler
- 10. Foetal lung maturation test
- 11. Placental grading

Indications

- Maternal
- Foetal
- Pregnancy related

Maternal

- Hypertension
- Diabetes
- Heart disease
- Chronic renal disease
- Sever anaemia
- APLA
- Acute illnesses

Foetal

- Foetal growth restriction
- Rh isoimmunisation
- Foetal cardiac arrhythmias
- Foetal infections

Pregnancy related

- Multiple pregnancy
- Gestational hypertension
- Preeclampsia
- Decreased foetal movement



- Abnormal placentation
- Placental abruption
- Amniotic fluid disorders
- PROM (Preterm rupture of membranes)
- GDM (Gestational diabetes mellitus)
- Previous unexplained still birth
- ICP
- Post term pregnancy

Time when foetal assessments should be done

Generally monitoring is recommended when estimated foetal maturity is sufficient (in the late second and the third trimester) to expect a reasonable chance of survival should intervention be necessary.

But it should be done previously when :

- Past history of adverse outcome
- Severity of maternal and foetal conditions

Prenatal screening in early pregnancy

Prenatal screening is a part and parcel of routine ante-natal care and is usually non-invasive.

1. Ultrasound : Generally screening test are non-invasive and diagnostic tests are invasive with ultrasound as exception; it is both screening as well as diagnostic test for congenital structural anomalies. Usually done during 2nd trimester and termed as anomaly scan.
2. Maternal serum alpha feto-protein (MS-AFP) : As the name suggest, it is a foetal protein produced in the yolk sac and foetal liver. It enters the amniotic fluid with foetal urine. In open NTD's (neural tube defect) there is extra AFP leak in amniotic fluid and so the maternal levels are raised. It is screened between 14-22 weeks, and its normal value is 2.5 ng/mL. High levels are usually indicative of poor pregnancy outcome and needs high resolution USG to rule out NTDs.

Raised MS-AFP : NTDs, abdominal wall defects, oesophageal atresia, duodenal atresia, sacrococcygeal teratoma, congenital nephrosis, urinary obstruction, renal anomalies, osteogenesis imperfect a congenital skin defects, placental chorio-gangioma, multiple pregnancies, LBW, reduced maternal weight, maternal hepatoma and teratoma, underestimated GA.

Low MS-AFP : Chromosomal Trisomy's gestational trophoblastic disease, intra uterine foetal death, overstimated GA, increased maternal age.

3. Acetyl cholinesterase is raised in open NTDs and low in abdominal wall defects.
4. Pseudocholeline esterase is low in NTDs but high in abdominal wall defects.
5. Triple test : Low MS-AFP, raised β -hCG, low unconjugated oestriol seen in Down's syndrome pregnancies between 15-20 weeks. The test results given a risk ration. 1:250 is taken as a cut off to perform amniocentesis.
6. Quadruple test : Triple test + inhibin A at 15-20 weeks (Inhibin a decreased in down's syndrome).
7. First trimester screening for Down's syndrome : Pregnancy associated placental protein-A (PPAP-A) low in Down's and raised β -hCG at 10 weeks with nuchal translucency between 10-14 weeks.
8. Screening for genetic disorders are recommended after birth of an affected child or if there is a positive family history. Hemoglobinopathies like thalassemia, sickle cell disease etc. can be ruled out by FBC with red cell indices and peripheral smear. It is further confirmed by PCR analysis of foetal DNA obtained by CVS (chorion villus sampling).

Prenatal diagnosis

	Chorion villus sampling	Amniocentesis	Cordocentesis
Time	Transcervical 10-12 weeks, Transabdominal 10 weeks to term	14-16 weeks (early 12-14 weeks)	18-20 weeks
Materials for study	Trophoblast cells	<ul style="list-style-type: none"> • Foetal fibroblasts • Fluid for biochemical study 	<ul style="list-style-type: none"> • Foetal white blood cells (others-infection and biochemical study)
Karyotype result	Direct preparation-24-48 hrs. Culture-10-14 days.	<ul style="list-style-type: none"> • Culture 3-4 weeks 	<ul style="list-style-type: none"> • Culture 24-48 hours
Foetal loss	1-2%	0.5-1%	2-4%
Accuracy	Accurate; may need amniocentesis for confirmation	Highly accurate	Highly accurate
Termination of pregnancy when indicated	1st trimester-safe	2nd trimester-risky	2nd trimester-risky
Maternal effects following termination of pregnancy	Very little	More traumatic; physically and psychologically.	Same as amniocentesis

Prenatal screening in late pregnancy

It is a screening test for utero-placental insufficiency. The foetal biophysical activities are initiated, modulated and regulated through foetal nervous system. The foetal CNS is very much sensitive to diminished oxygenation. Hypoxia → metabolic acidosis → CNS depression → changes in foetal biophysical activity.

The following biophysical tests are used :

1. Foetal movement count
 - a. Cardiff 'count 10' formula
 - b. Daily foetal movement count (DFMC)
2. Cardiotocography
3. Non stress test (NST)
4. Foetal biophysical profile (BPP)
5. Doppler ultrasound
6. Vibroacoustic stimulation test (VAST)
7. Contraction stress test (CST) or Oxytocin challenge test (OCT)

Foetal movement count

A pregnant woman should perceive at least 10 movements in 12 hour period, but for practical purpose it is advisable to ask a woman to count up to 3 movements in an hour.

Non-stress test (NST)

NST by cardiotocography is the most commonly used method for assessing foetal well being. This test is based on the hypothesis that heart rate of the foetus accelerates in response to foetal movements. The frequency of this test is in accordance to the clinical indication i.e. once/twice daily in high risk cases and once in a week for low risk cases. It is indicative of acute foetal hypoxia and is of limited value in extremely premature infant or gestation prior 30-32 weeks due to CNS immaturity.

Reactive NST presence of two or more foetal heart rate accelerations during 20 minute period, with each acceleration of ≥ 15 beats/min lasting for ≥ 15 sec occurring with foetal movements. Accelerations without foetal movements are also accepted but extended for 40 min.

Non-reactive NST is usually associated with foetal hypoxia, sleep periods, GA < 28 weeks. Non-repetitive and brief variable decelerations are insignificant but repetitive (at least 3 in 10 min) or prolonged (> 30 sec) variable decelerations are considered abnormal.

Biophysical Profile

Foetal biophysical profile considers several parameters. BPP using real time ultrasonography as productive value.

Scoring (Manning-1985)

Observation for 30 minutes. Normal score=2, Abnormal=0

Parameters	Minimal normal criteria	Score
1. Non stress Test (NST)	Reactive pattern	2
2. Foetal breathing movements	1 episode lasting > 30 sec.	2
3. Gross body movement	3 discrete body/limb movements	2
4. Foetal muscle tone	1 episode of extension (limb or trunk) with return of flexion	2
5. Amniotic fluid	1 pocket measuring 2 cm in two perpendicular planes	2

BPP score	Interpretation	Management
8-10	Non foetal asphyxia	Repeat testing at weekly interval
6	Chronic asphyxia	If > 36 weeks → deliver
4	Chronic asphyxia	If ≥ 36 weeks deliver, if < 32 weeks repeat testing in 4-6 hours
0-2	Certain asphyxia	Test for 120 min. → persistent score ≤ 4 → deliver regardless of gestational age

Ultrasound

A single series of measurements at one point in time can diagnose a small or a large foetus, but the overall growth pattern can only be assessed over at least 2 separate scans, at least 14 days apart. The measurements will be plotted onto a foetal growth chart, which is a graphical representation of baby individual growth pattern.

Amniotic fluid volume

It is the most important parameter in the antepartum foetal assessment. This is based on the fact that decreased utero-placental perfusion results in decreased renal blood flow, decreased urine output leading to oligohydramnios.

Techniques of assessment : It is calculated by dividing the uterus into four

REDUCED AMNIO FLUID VOLUME

quadrants and measuring largest vertical pocket or liquor in each quadrant during ultrasonography. The sum of four measurement is amniotic fluid index (AFI). Normal value of AFI is 5-25 cm.

Single deepest pocket (SDP)— It is depth of single cord free pocket of amniotic fluid. Its normal value is 2-8 cm.

Vibro acoustic stimulation test (VAST)

An external sound stimulus applied for 1-2 sec is used to provoke the foetal heart rate acceleration in non-reactive cases. Only 2 % of NSTs are non-reactive to VAST. It is indicative of chronic foetal hypoxia.

Oxytocin challenge test / Contraction stress test

This test is based on the fact that utero-placental blood flow decreases markedly during uterine contractions and a normal foetus can only withstand such hypoxia without much difficulty. FHR and uterine contractions are monitored with an external monitor. This test indicates whether the foetus can tolerate the stress of labour.

A. Negative test— No significant variable or late decelerations.

B. Positive test— Late decelerations following 50% or more of the contractions

C. Equivocal test— No significant variable or intermittent late decelerations.

D. Suspicious test— Inconsistent decelerations elicited but not with all the contractions.

E. Unsatisfactory test— Less than 3 contractions in 10 min or uninterpretable.

CST is contraindicated in placenta praevia, vertical uterine scar, cervical incompetence, twins etc.

Nipple stimulation test

It is cheap and non-invasive test based on the fact that nipple stimulation in late pregnancy releases oxytocin via neurohypophyseal reflex inducing uterine contractions.

Cardiotocography and Doppler ultrasound are described in chapter special topics of obstetrics.

Vaccination during Pregnancy

Ideally, women should embark on pregnancy with pre-existing immunity to common infective diseases. This not only saves the mother from the risks associated with acquiring infection during pregnancy, but also avoids the potential risks of vaccination with a foetus growing in utero. However, the need for vaccination during pregnancy may arise due to an outbreak of infection or the necessity to travel to an area endemic for a particular infective disease.

The hazards of maternal vaccination to a developing foetus are largely theoretical, and there is no evidence of foetal risks as a result of immunisation with inactivated virus or bacterial vaccines or toxoids. Therefore, the benefit of immunising a mother who is at high risk of infection usually outweighs the potential risks to the foetus. Besides, the foetus acquires immunity for a variety of infections through transmission of antibodies from the mother, before the baby itself is vaccinated and generates immunity of its own. This protects the baby in the immediate neonatal period from infections like pertussis, which is showing resurgence.

Vaccinations for measles, mumps, and rubella are contraindicated in pregnancy and pregnancy should be avoided for at least four weeks after the administration of the vaccine. Table described below provides the indications and risks of common vaccines during pregnancy based on the recommendations of Center for Diseases Control and Prevention (updated in September 2006), and American College of Obstetricians and Gynecologists.

Passive Immunisation in Pregnancy

Administration of standard or specific immuno-globulins for passive immunisation of the mother during pregnancy has not been shown to have any adverse effects or risks to the foetus.

Breastfeeding and Vaccination

Breastfeeding does not adversely affect immunisation and is not a contraindication for any vaccine, with the exception of smallpox vaccine. Neither inactivated nor live vaccines administered to a lactating woman affect the safety of breastfeeding for women or their infants.

Indications and risks of common vaccines during pregnancy

Infective agent	Nature of vaccine	Indications	Vaccination schedule
Anthrax	Cell free filtrate from B. anthracis	Indicated if high risk of infection. No studies on safety of vaccination in pregnancy	Six dose primary vaccination SC, then annual booster
BCG	Live-attenuated virus	Contraindicated	
Hepatitis A	Inactivated virus	Pre-exposure and post-exposure prophylaxis in women at high risk	Two doses at 6 months interval
Hepatitis B	Purified recombinant surface antigen	Pre-exposure and post-exposure prophylaxis in women at high risk	Three doses IM at 0,1, 6 months
Influenza	Inactivated (live-attenuated influenza virus vaccine should not be given in pregnancy)	All women pregnant during the flu season can be vaccinated in any trimester	One dose IM

Measles	Live-attenuated virus	Contraindicated in pregnancy. Pregnancy should be avoided for 4 weeks after vaccination. Recommended postpartum in susceptible women, breastfeeding not contraindicated.	Postpartum: Single dose SC, preferably as measles-mumps-rubella
Meningo-coccal	Inactivated bacterial vaccine	As in non-pregnant	One dose SC
Mumps	Live-attenuated virus	Contraindicated in pregnancy. Pregnancy should be avoided for 4 weeks after vaccination. Recommended postpartum in susceptible women.	Postpartum: Single dose SC, preferably as measles-mumps-rubella
Pneumo-coccal	Inactivated bacterial vaccine	As in non-pregnant	One dose SC/IM. Consider re-repeat dose in 6 years in high risk
Rabies	Killed virus vaccine	As in non-pregnant	
Rubella	Live-attenuated virus	Contraindicated in pregnancy. Pregnancy should be avoided for 4 weeks after vaccination. Recommended postpartum in susceptible women.	Postpartum: Single dose SC, preferably as measles-mumps-rubella
Tetanus	Toxoid	Lack of primary series or no booster within 10 years	For previously unimmunised: Two doses IM at 1-2 months interval in second/third trimester. Booster if >10 years since last vaccination
Tdap (Tetanus, diphtheria, pertussis)		To all pregnant women. Can be given any time during pregnancy.	One dose in every pregnancy, preferably between 27-36 weeks.
Typhoid	Parenteral: Vi polysaccharide vaccine (ViCPS) Oral: Live-attenuated	Not indicated routinely except for close continuous exposure or travel to endemic area. Oral vaccine contraindicated. Parenteral can be given.	ViCPS: Single injection IM
Varicella	Live-attenuated virus	Contraindicated in pregnancy.	
Yellow fever	Live-attenuated virus	Contraindicated. Administered only if travel to endemic area is unavoidable	Two doses at 4-8 weeks interval
Herpes zoster	Live-attenuated virus	Contraindicated	Single dose SC

गर्भ-व्यापद्

.....तथाष्टौ	गर्भजा	गदाः ॥
उपविष्टकगर्भः	स्यात्तया नागोदरः	स्मृतः ।
मक्कलो	मूढगर्भश्च विष्कम्भो	गूढगर्भकः ।
जरायुदोषो	गर्भस्य पातश्चाष्टमकः	स्मृतः ॥

(शा.सं.पूर्व. 7/180-181)

शार्ङ्गधर ने आठ गर्भज रोगों का नामोल्लेख किया है परन्तु इनके विशिष्ट लक्षणों आदि का वर्णन नहीं किया ।
जो इस प्रकार है—

- उपविष्टक
- नागोदर
- मक्कल्ल
- मूढगर्भ
- विष्कम्भ
- गूढगर्भ
- जरायु-दोष
- गर्भपात ।

गर्भ व्यापति का कारण—महर्षि भेल ने पुरुष का स्त्रीस्वरत्व, स्त्री का पुरुषस्वरा होना तथा आमगर्भ की च्युति होना आदि विकारों को गर्भ व्यापति का कारण माना है ।

गर्भस्त्राव एवं गर्भपात

परिभाषा

आचतुर्थात् ततो मासात् प्रस्रवेद् गर्भविच्युति ।
ततः स्थिरशरीरस्य पातः पञ्चमषष्ठयोः ॥

(सु.सं.नि. 8/12)

गर्भधारण के दिन से चतुर्थ मास तक गर्भ के विच्युति (स्वस्थान से अलग होकर गिरना) को गर्भस्त्राव कहते हैं तथा उसके बाद पाँचवें और छठवें मास में स्थिर (हस्तपादादि अंगों से युक्त तथा घन) शरीर के विच्युति को गर्भपात कहते हैं ।

अर्थात् चतुर्थ मास तक की गर्भ-च्युति को गर्भस्त्राव तथा पाँचवें एवं छठे महीने की गर्भ-विच्युति को गर्भपात कहते हैं ।

आचार्य माधवकर, भाव मिश्र एवं योगरत्नाकर ने गर्भ के चतुर्थ मास तक गर्भ का विद्रव होना गर्भस्त्राव माना है ।

मधुकोष में भोज का वचन उद्धृत करते हुए गर्भस्त्राव की मर्यादा तीन माह तक तत्पश्चात् संघातभूत होने के कारण गर्भपात की संज्ञा दी गई है ।

निदान

सा चेच्चतुष्प्रभृतिषु मासेषु क्रोधशोकासूयेर्ष्याभयत्रासव्यवायव्यायामसंक्षोभसंधारण
विषमाशनशयनस्थानक्षुत्पिपासातियोगात् कदाहारद्वा पुष्पं पश्येत् । (च.सं.शा. 8/24)

ग्राम्यधर्मयानवाहनाध्वगमनप्रस्खलनप्रपतनप्रपीडनधावनाभिघातविषमशयनासनोपवासवेगा-
भिघातातिरूक्षकटुतिक्तभोजनशोकातिक्षारसेवनातिसारवमनविरेचनप्रेङ्खोलनाजीर्णगर्भशातन-
प्रभृतिभिर्विशेषैर्बन्धनान्मुच्यते गर्भः, फलमिव वृन्तबन्धनादभिघातविशेषैः ॥ (सु.सं.नि. 8/3)

कृमिवाताभिघातैस्तु तदेवोपद्रुतं फलम् ।
पतत्यकालेऽपि यथा तथा स्याद् गर्भविच्युतिः ॥

(सु.सं.नि. 8/11)

आचार्यों ने गर्भस्त्राव एवं गर्भपात के निदान का विस्तृत रूप में वर्णन किया है जिसका संक्षिप्त वर्णन इस प्रकार है—

- गर्भ-वृद्धि के जो हेतु बताए गए हैं यदि उनमें विकार या विपरीतता।
- वायु की विकृति।
- शुक्र, आर्तव, आत्मा, गर्भाशय, ऋतुकाल तथा माता के आहार-विहार के विकार।
- कृमि, वात एवं आघात से उपद्रुत।
- मानसिक और आगन्तुक दुखों के कारण तथा व्याधियों से (गर्भ अपनी स्वयं की व्याधियों से) पीड़ित होने।
- रजःस्त्राव के तीसरे दिन संभोग से गर्भाधान होने।
- पच्चीस वर्ष से कम आयु के पुरुष द्वारा सोलह वर्ष से कम आयु की स्त्री में गर्भाधान कराने।

आहारज निदान— कदाहार सेवन, क्षार का अतिसेवन, गर्भपातक औषधियों का प्रयोग, तीक्ष्ण, उष्ण, कटु, तिक्त तथा रूक्ष द्रव्यों का सेवन, सर्षप शाक, मन्दक दधि का अत्यधिक सेवन।

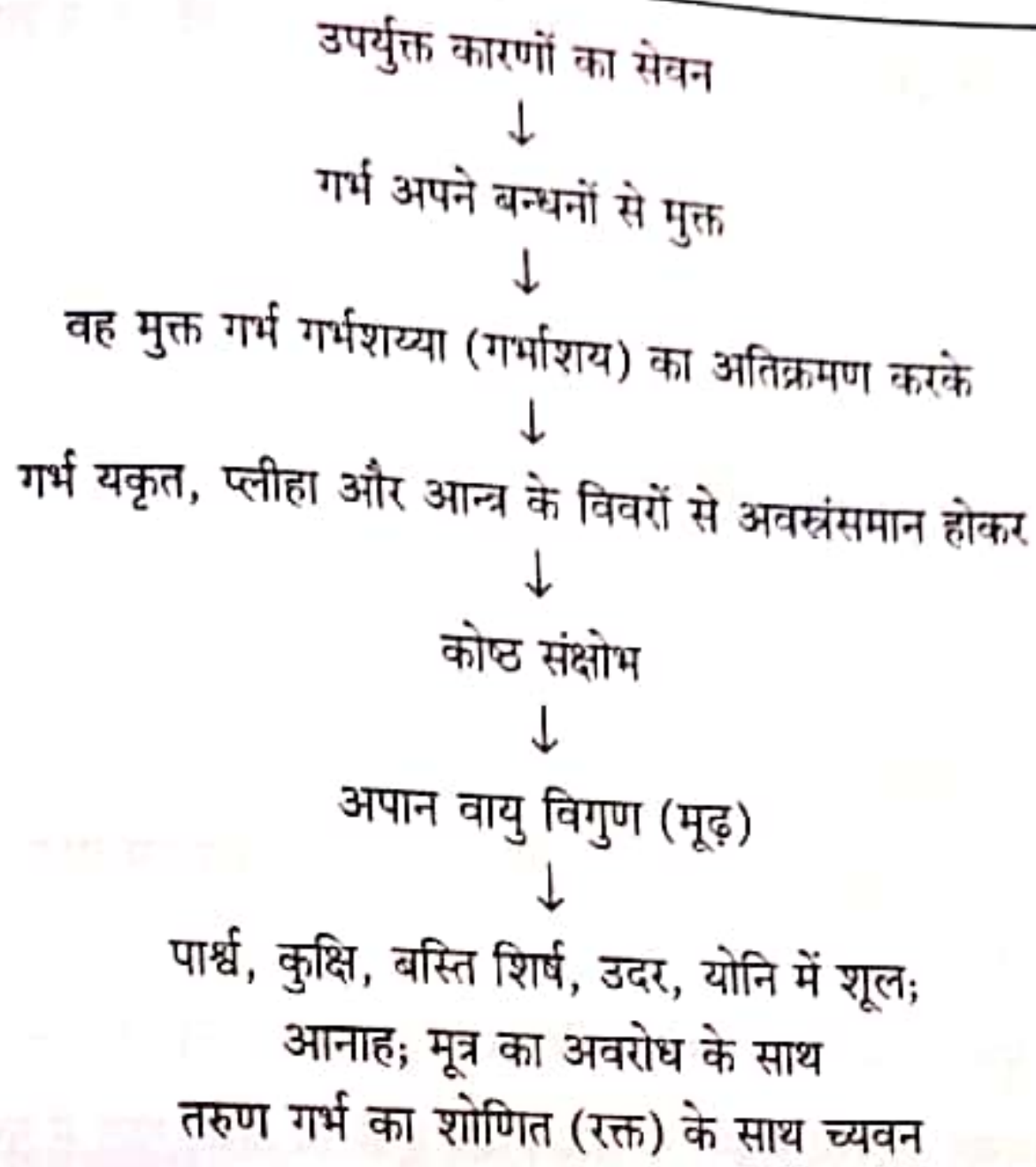
विहारज निदान— व्यवाय, (अत्यधिक) व्यायाम, संक्षोभ, वेग-विधारण, विषम रूप से या विषम स्थान में बैठने, सोने या खड़े होने, भूख एवं प्यास का अतियोग (अत्यधिक निरोध करना), यान (रथादि की सवारी), वाहन (अश्वदि की सवारी), अध्वगमन (पैदल चलना), प्रस्खलन (लड़खड़ाना) प्रपतन (ऊँचे स्थान से तीव्रता से गिर जाना), प्रपीडन, धावन, अभिघात (शस्त्र आदि से प्रहार), प्रेङ्खोलन (झूले में झूलना), वमन एवं विरेचन का अतिप्रयोग।

मानसिक निदान—क्रोध, शोक, दूसरे की निन्दा या असंतोष, ईर्ष्या, भय, त्रास।

व्याधियाँ—अतिसार, अजीर्ण, ज्वर, विंशति योनिदोष, वात के अस्सी विकार, प्रकुपित वायु के शुक्रस्थ होने पर गर्भस्त्राव या गर्भपात होता है।

सम्प्राप्ति

यद्यपि गर्भ-स्त्राव एवं पात की सम्प्राप्ति का वर्णन आचार्यों ने पृथक् रूप से कही नहीं किया, परन्तु मूढ़गर्भ एवं गर्भपात का वर्णन एक साथ ही होने के कारण यह सम्प्राप्ति दोनों की ही मानना चाहिए।



सामान्य लक्षण

तत्र पूर्वोक्तैः कारणैः पतिष्यति गर्भे गर्भाशयकटीवङ्क्षणवस्तिशूलानि रक्तदर्शनं च ।

(सु.सं.शा. 10/62)

तत्र यस्या वस्तिपार्श्वश्रोणियोनिमुखेषु शूलं पुष्पदर्शनं वा स्यात् । (अ.सं.शा. 4/3)

पुष्पे दृष्टेऽथवा शूले.....। (अ.ह.शा. 2/1)

- गर्भाशय, कटि, वंक्षण पार्श्व, श्रोणि, योनिमुख एवं बस्तिप्रदेश में शूल
- रक्त या पुष्प का दर्शन
- टीकाकार डल्हण ने शूलोत्पत्ति गर्भपात-जन्य प्रकुपित वायु के कारण तथा रक्तस्राव आमगर्भ के पात अथवा आर्तववह स्रोतस् के मुख के खुल जाने से उत्पन्न आर्तव-स्राव के कारण बताया है ।
- आनाह
- मूत्रसङ्ग

विशिष्ट लक्षण

1. प्रस्रंसमान गर्भ के लक्षण

प्रस्रंसमाने सदाहपार्श्वपृष्ठशूलासृग्दरानाहमूत्रसङ्गाः । (सु.सं.शा. 10/62)

गर्भ के प्रस्रंसमान अर्थात् पतन के लिए कुछ चलने की अवस्था में निम्न लक्षण उत्पन्न होते हैं—

- पार्श्व एवं पृष्ठ में दाह-युक्त शूल
- असृग्दर (अत्यधिक रक्तस्राव)
- आनाह
- मूत्रसङ्ग

2. गर्भ के स्थानान्तर गमन के लक्षण

स्थानात् स्थानं च प्रक्रामति गर्भे कोष्ठे संरम्भः ॥ (सु.सं.शा. 10/62)

गर्भ के एक स्थान से दूसरे स्थान में जाने से कोष्ठ में क्षोभ उत्पन्न होता है। टीकाकार डल्हन ने शूलादि लक्षणों का भी समावेश किया है।

गर्भस्राव की चिकित्सा में कठिनता का कारण

सा चेदपचाराद् द्वयोस्त्रिषु वा मासेषु पुष्यं पश्येन्नास्या गर्भः स्थास्यतीति विद्यात्; अजातसारो हि तस्मिन् काले भवति गर्भः। (च.सं.शा. 8/23)

अपूर्णत्रिमासायास्तु पुष्यदर्शने गर्भः प्रायो न तिष्ठत्यसञ्जातसारत्वात्। (अ.सं.शा. 2/6-7)

उस गर्भिणी स्त्री को अपचार (अपथ्य सेवन) के कारण यदि दूसरे या तीसरे मास में पुष्य-दर्शन (रक्तस्राव) हो तो वह गर्भ स्थित नहीं होता क्योंकि उस काल में गर्भ अजातसार या असंजातसार (सारहीन) होता है।

टीकाकार इन्दु के अनुसार यदि सम्यक् चिकित्सा भी की जाय तब भी गर्भ नहीं ठहरता। तीन मास के बाद चौथे मास आदि में भी अकाठिन्य (अदृढ़ता) होने पर गर्भ नहीं ठहरता।

यस्याः पुनरामान्वयात् पुष्यदर्शनं स्यात्, प्रायस्तस्यास्तद्गर्भोपघातकरं भवति, विरुद्धोपक्रमत्यात्तयोः ॥ (च.सं.शा. 8/25)

गर्भिणी स्त्री को तीसरे मास के बाद भी आमन्वय के कारण पुष्यदर्शन होता है तो वह विरुद्ध उपक्रम होने के कारण उस गर्भ को घातक होता है। चक्रपाणि ने विरुद्धोपक्रम के स्पष्टीकरण में लिखा है कि गर्भस्राव में स्तम्भन के लिए शीत, मृदु, मधुर चिकित्सा करनी होती है जो आम के अविरुद्ध एवं आमजनक है तथा आमदोष की चिकित्सा लघु, रुक्ष, उष्ण द्रव्य से की जाती है जो रजःस्राव की वृद्धि करेगा अतएव जब आम की चिकित्सा की जायेगी तो रजःस्राव की वृद्धि हो जायेगी एवं जब रजःस्राव की चिकित्सा की जायेगी तो आम की वृद्धि हो जायेगी। अतः विरुद्धोपक्रम से गर्भ में बाधा उत्पन्न हो जाती है।

असम्पूर्णत्रिमासायाः प्रत्याख्याय प्रसाधयेत् ॥ (अ.ह.शा. 2/6-7)

वाग्भट के अनुसार तीन मास के पूर्व गर्भस्राव होने पर प्रत्याख्यान (असाध्य) कह कर ही चिकित्सा करनी चाहिए और तीन मास के बाद भी यदि आम सम्बद्ध रक्त स्राव होने लगे तो असाध्य कह कर चिकित्सा करनी चाहिए। टीकाकार अरुणदत्त ने भी लिखा है कि तीन मास से पूर्व गर्भ आमन्वय एवं असंजातसार होने के कारण बहुत ही कठिनता पूर्वक रुकता है। आमन्वय होने पर सम्पूर्ण तीसरे एवं चौथे मास या इसके बाद संजातसार होने पर भी विरुद्धोपक्रम होने के कारण कठिनता पूर्वक ही रुकता है।

गर्भस्राव अथवा गर्भपात के उपद्रव

आचार्यों ने कुछ व्याधियों के निदानान्तर्गत गर्भस्राव एवं गर्भपात का वर्णन किया है। जिन्हें गर्भस्राव अथवा पात का उपद्रव माना जा सकता है। जैसे—

- शोथ
- अर्श
- अपतानक
- गर्भस्फुरण
- अत्यधिक वेदना
- अत्यधिक रक्तस्राव
- अदृष्टशोणित वेदना
- मूत्रसङ्ग
- बस्ति - उदर शूल

चिकित्सा

1. आम गर्भस्राव की चिकित्सा

इसका वर्णन आचार्य सुश्रुत एवं वाग्भटद्वय ने विस्तृत रूप में किया है।

पात होने के पूर्व चिकित्सा—

- रुक्ष एवं शीत द्रव्यों का प्रयोग।
- प्रथम उपवास करने के पश्चात् दुरालभा, अमृता, उशीर, पर्पटक, घन, चन्दन, अतिविषा, बला, कट्वङ्ग तथा घान्यक का क्वाथ पान।
- तृण-धान्य, शालि या षष्टिक का पेया या भोजन के रूप प्रयोग।
- मुद्गादि से बने यूष का पान।
- आम के शांत हो जाने पर स्निग्ध, शीत या स्निग्ध क्रिया पूर्ववत् करें।

पात हो जाने के बाद चिकित्सा—

आमगर्भे तु पतिते मद्यानामन्यतमं सामर्थ्यतः पाययेद्गर्भकोष्ठविशुद्ध्यर्थमर्तिविस्मरणार्थं चा
अमद्यपां पाचनीयद्रव्योपहिताभिः स्नेहलवणवर्जाभिः सतिलाभिरुद्दालकादियवागूभिरुपाचरेद्यावन्तो
पासास्तावन्त्यहनीति । (अ.सं.शा. 4/10)

- आम गर्भ के पात हो जाने के बाद गर्भकोष्ठ की शुद्धि तथा वेदना विस्मरण के लिए सामर्थ्यानुसार मद्य का पान।
- मद्यपान के पश्चात् लघुपञ्चमूल से सिद्ध रुक्ष (स्नेह रहित) पेया का पान।
- मद्यापन न करने वाली स्त्री को पाचन द्रव्यों से युक्त, तिल एवं उद्दालक से बनाई, लवण तथा स्नेह से विरहित यवागू अथवा तिल, उद्दालक या तण्डुल से, बिल्वपंचक (बृहत पंचमूल) के क्वाथ में बनी हुई पचकोल कल्क,

- से सिद्ध पेया आदि का क्रम से उतने दिन तक प्रयोग करें जितने मास का गर्भपात हुआ हो अर्थात् यदि तीन मास का गर्भपात है तो तीन दिन यह पेयादि क्रम दें ।
- आचार्य सुश्रुत ने मद्य का विधान नहीं किया है तथा गर्भ के पतित होने पर पाचनीय द्रव्यों से संस्कृत, लवण एवं स्नेह से विरहित उद्दालक आदि की यवागू जितने मास का गर्भ है उतने दिन तक पान का वर्णन किया ।
 - स्नेह एवं लवण विरहित दीपनीय द्रव्य युक्त लघु पेया का पान ।
 - योग रत्नाकर ने कम दिन का गर्भपात होने पर वेणुग्रन्थि, कुलत्थ एवं हरिद्रा का क्वाथ पीने का निर्देश दिया है ।
 - शार्ङ्गधर ने अकालप्रसूता को प्रसव (गर्भस्त्राव या गर्भपात) हो जाने के पश्चात् स्वेदन देने का निर्देश दिया है ।
 - जब तक विकृत दोषों तथा धातुओं के क्लेद की शुद्धि न हो जाए तब तक प्रीणन (तृप्तिदायक) द्रव्यों द्वारा संस्कृत, बल की रक्षा करने वाला, स्नेह रहित आहार देना चाहिए ।
 - पेयादि प्रयोग से दोष एवं धातुओं के परिक्लेद (आमोत्पन्न क्लेद) का शोषण हो जाता है ।

आम गर्भ के शेष रह जाने पर चिकित्सा

आमगर्भशेषेण हि पुनः पुनः शूलमनुषज्येत । तस्मात्तीक्ष्णैरनवशेषयन्नुपाचरेत् ॥

(अ.सं.शा. 4/10)

आमगर्भ शेष रह जाने पर बार-बार शूल उत्पन्न करता है अतः तीक्ष्णादि द्रव्यों के प्रयोग से सम्पूर्ण बाहर निकल जाने तक उपचार करें ।

आमगर्भ के पूर्ण रूप से निकल जाने पर चिकित्सा

ततःपरं स्नेहपानैर्बस्तिभिराहारैश्च दीपनीयपाचनीयजीवनीयबृंहणीयमधुरवातहरैरिति ॥

(अ.सं.शा. 4/10)

आमगर्भ के पूर्णरूपेण निकल जाने के बाद स्नेहपान, बस्ति एवं दीपनीय, पाचनीय, जीवनीय, बृंहणीय, मधुर तथा वातहर आहार द्वारा चिकित्सा करनी चाहिए ।

आचार्य चरक ने अन्तर्मृत गर्भा के वर्णन के पश्चात् गर्भ-श्लोयद्धरण की चिकित्सा वर्णन की है तथा पश्चात् कर्म में व्यपगत गर्भशल्या एवं आमगर्भा शब्दों का प्रयोग किया है अर्थात् वही चिकित्सा यहाँ भी करनी चाहिए ।

अपप्रसूता या अकाल प्रसूता को स्नेह पान का निषेध एवं स्नेह देने का परिणाम

आचार्यों ने अकाल प्रसूता (समय से पूर्व प्रसूता अर्थात् गर्भस्त्राव वाली स्त्री) या अपप्रसूता (स्रुतगर्भा-अरुणन्) को स्नेह पान कराने का निषेध किया है । महर्षि सुश्रुत ने वर्णन किया है कि अकाल प्रसूता को स्नेहपान कराने से गर्भशय के अन्दर रक्त, क्लेद एवं मल आदि दोष अवशेष रह जाते हैं । डल्हण के अनुसार ये रक्तादि अवशेष दोष स्नेह से कुपित होकर असाध्य रोग उत्पन्न कर देते हैं । अतः अकाल प्रसूता को स्नेह का पान नहीं कराकर दस दिन तक एतन्न एवं रूक्ष औषधियों का प्रयोग करने का निर्देश दिया है ।

2. प्रस्रंसमान एवं स्थानान्तर गमित गर्भ की चिकित्सा

तत्र स्निग्धशीताः क्रियाः ॥ (सु.सं.शा. 10/62)

इसमें स्निग्ध एवं शीत क्रिया का प्रयोग करना चाहिए ।

भावप्रकाश तथा योगरत्नाकरकार के अनुसार प्रचलित गर्भ एवं कुक्षि-रुजा में हीबेर, अतिविषा, मुस्ता, मोच तथा शक्र का क्वाथ बनाकर देना चाहिए ।

3. मुहुः मुहुः रक्तस्राव की चिकित्सा

गुर्विण्या गर्भतो रक्तं स्रवेद्यादि मुहुर्मुहुः ।
तन्निरोधाय सा दुग्धनुत्पलादिशृतं पिबेत् ॥

(भा.प्र.चि. 70/74)

भावमिश्र ने गर्भिणी स्त्री के गर्भ से बार-बार रक्तस्राव होने पर उसे रोकने के लिए उत्पलादि गण की औषधियों से सिद्ध दुग्ध का पान कराने का निर्देश किया है ।

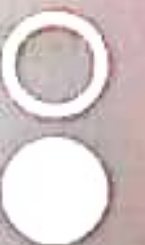
4. परिहार्य गर्भस्राव की चिकित्सा

- उसे (पुष्प-दर्शन होने वाली गर्भवती स्त्री को तत्काल ही) मृदु, सुखकारी एवं शीतल विस्तर पर शिर को थोड़ा सा नीचे की ओर करके शयन कराए ।
- शीतल परिषेक, अवगाह, प्रदेह एवं जीवनीय औषधियों से सिद्ध क्षीर-पान आदि के द्वारा चिकित्सा करें ।
- महर्षि भेल ने दोषानुसार चिकित्सा करने का निर्देश किया है ।
- वाग्भट ने शोधन-विरहित रक्तपित्त की क्रिया करने का निर्देश दिया है ।
- इसमें दुग्ध-पान पथ्य होता है ।

बाह्य-प्रयुक्त औषधियाँ

- मधुयष्टी एवं सर्पि से आप्लावित अति शीतल जल में रखे हुए पिचु को उपस्थ के समीप (योनि में) धारण करें ।
- शतधौत या सहस्रधौत घृत को नाभि के नीचे चारों ओर प्रदेह (लेप) करें ।
- अच्छी प्रकार शीतल किए हुए गाय के दुग्ध या मधुयष्टी के क्वाथ या न्यग्रोधादिगण औषधियों के कषाय से नाभि के नीचे परिषेचन ।
- अच्छी प्रकार से शीतल जल से अवगाहन ।
- कषाय एवं क्षीरिवृक्षों के स्वरस में पिचु भिगोकर योनि में ग्रहण (धारण) करें ।
- न्यग्रोधादि गण के शुंग से साधित क्षीरसर्पि (क्षीरोद्धृत घृत) अथवा क्षीर या सर्पि का पिचु धारण करें ।
- मधुयष्टी से सिद्ध अच्छी प्रकार से शीतल घृत की पिचु योनि के समीप स्थापन करें ।
- न्यग्रोधादिगण से सिद्ध तैल का पिचु योनि में धारण करें ।
- योगरत्नाकर के अनुसार कुमारी लड़की के द्वारा काटे हुए गर्भिणी के शरीर के बराबर लम्बे सूत्र में कंकती ली जड़ को बाँधकर कमर में धारण करें ।
- गर्भिणी का लक्षादि तैल से बार-बार अभ्यङ्ग करने से गर्भ पुष्ट होता है ।

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आभ्यन्तर प्रयुक्त औषधियाँ

- चक्रपाणि एवं इन्दु ने गर्भस्थापक औषधियों का प्रयोग करने का निर्देश किया है ।
- डल्हन, इन्दु एवं अरुणदत्त ने गर्भस्थापन हेतु पुंसवन कर्मान्तर्गत वर्णित लक्ष्मणा का मुख या नासा से प्रयोग करने का निर्देश दिया है ।
- न्यग्रोधादि शुङ्ग से साधित क्षीरसर्पि एक अक्ष की मात्रा में पान ।
- केवल क्षीरसर्पि का पान ।
- पद्म, उत्पल, कुमुद के केशरों का कल्क, मधु एवं शर्करा के साथ या सिता, मधु एवं क्षीरघृत के साथ चटायें ।
- शृंगाटक, कसेरु एवं पुष्करबीज का सेवन ।
- गन्धप्रियंगु, नीलकमल, शालूक (कमल की जड़), उदुम्बर-शलाटु एवं न्यग्रोध-शुङ्ग को अजा-क्षीर के साथ पान ।
- लाव, कपिंजल, कुरंग (मृग), शाम्बर (बारहसिंघा), शशक, हरिण, कालपुच्छक (काली पुँछ वाली हिरण) के मांस रस को घृत से सुसंस्कृत करके गर्भिणी को सुखाकारी, शीतल, वायु- युक्त स्थान में बैठाकर रक्तशाली के ओदन के साथ सेवन कराएँ ।
- धातकी, गैरिक, सर्जरस एवं रसांजन के चूर्ण को मधु के साथ चटायें ।
- न्यग्रोधादि गण के वृक्षों की त्वचा या कोमल पत्तों के कल्क को अकेला ही या दुग्ध के साथ पान ।
- शार्ङ्गधर ने जीवनीयगण की औषधियों को स्वादु (मधुर) एवं गर्भसंधानकृत (गर्भ को गिरने से रोकने वाला) बताया है ।
- जीवनीय गण की औषधियों से सिद्ध क्षीर अथवा क्षीर में शालि-पिष्टी मिलाकर सेवन ।
- उत्पलादि गण या कशेरू, शृंगाटक एवं शालूक कल्क को दुग्ध के साथ शृत करके (उबाल कर) पान ।
- शश, एण एवं हरिण के रक्त को मधु के साथ पान ।
- आचार्य काश्यप ने गर्भस्त्राव में दुग्ध पान हितकारी बताया है ।

5. गर्भ के व्यवस्थित हो जाने पर चिकित्सा

व्यवस्थिते च गर्भे गव्येनोदुम्बरशलाटुसिद्धेन पयसा भोजयेत् ॥ (सु.सं.शा. 10/61)

गर्भ के व्यवस्थित हो जाने पर उदुम्बर-शलाटु (गूलर के कच्चे फल) से सिद्ध गोक्षीर का सेवन कराना चाहिए ।

गर्भस्त्राव में पथ्य विहार

- क्रोध, शोक, आयास, व्यावाय एवं व्यायाम का परित्याग ।
- सौम्य तथा मनोनुकूल आदि मन को प्रसन्न करने वाले कथाओं का सेवन ।

गर्भस्त्राव के उपद्रवों की चिकित्सा

गर्भस्फुरण की चिकित्सा- गर्भ में बार-बार स्फुरण होने पर संधारण के लिए उत्पलादि गण की औषधियों से सिद्ध क्षीर का पान ।

अत्यधिक वेदना की चिकित्सा— महासहा, क्षुद्रसहा, मधुक, श्वदंष्ट्रा तथा कण्टकारी से सिद्ध शर्करा एवं मधु-
युक्त क्षीर पान ।

अत्यधिक रक्तस्राव की चिकित्सा— कोष्ठागारिका के घर की मिट्टी, समंगा, धातकी पुष्प, नवमालिका, गौरिक,
सर्जरस तथा रसांजन के चूर्ण को मधु के साथ चटाएँ।

मूत्रसङ्ग की चिकित्सा— दर्भादि (कुश, काश नल, दर्भ, काण्डेशुक) से सिद्ध शर्करा या मधु मिश्रित क्षीर पान ।

आनाह की चिकित्सा— हिंगु, सौवर्चल लवण, लशुन एवं वचा से सिद्ध क्षीर में मधु तथा शर्करा मिलाकर या
अकेले ही पान ।

अदृष्ट शोणित-वेदना की चिकित्सा— दृष्ट रक्तस्राव के बिना ही वेदना होने पर निम्न चिकित्सा का प्रयोग करें—

- मधुक, देवदारु, मञ्जिष्ठा एवं पयस्या से सिद्ध दुग्ध का पान ।
- अश्मन्तक, शतावरी एवं पयस्या से सिद्ध दुग्ध का पान ।
- विदारिगन्धादि गण की औषधियों से सिद्ध दूध दें ।
- बृहतीद्वय, उत्पल, शतावरी, सारिवा, पयस्या एवं मधुक से सिद्ध दुग्ध का पान ।
- श्वदंष्ट्रा स्वरस से सिद्ध दुग्ध या घृत का पान ।
- पलाण्डु स्वरस से सिद्ध घृत मधु के साथ सेवन ।

दाह की चिकित्सा— स्निग्ध एवं शीत क्रिया का प्रयोग ।

महत्वपूर्ण— • उत्पलादिगण की औषधियों से

सिद्ध क्षीर पान - सुश्रुत → गर्भस्फुरण की चिकित्सा

भावमिश्र → मुहुर्मुहु रक्तस्राव की चिकित्सा

• स्निग्ध एवं शीत क्रिया - सुश्रुत → प्रसंसमान एवं स्थानान्तर गमित गर्भ की चिकित्सा

भावमिश्र → दाह की चिकित्सा

गर्भस्राव की मासानुमासिक चिकित्सा

अत	उर्ध्व	मासानुमासिकं	वक्ष्यामः॥
मधुकं	शाकबीजश्च	पयस्या	सुरदारु च ।
अश्मन्तकस्तिलाः		कृष्णास्ताम्रवल्ली	शतावरी ॥
.....			
एवमाप्यायते	गर्भस्तीव्रा	रुक्	चोपशाम्यति ॥

(सु.सं.शा. 10/63-64)

आचार्य सुश्रुत, वाग्भटद्वय, भावप्रकाश एवं योगरत्नाकर ने गर्भस्राव के प्रत्येक मास में प्रयुक्त औषधियों का वर्णन
किया है । इन औषधियों का प्रयोग एक साथ अथवा उपलब्धता के अनुसार अकेले भी किया जा सकता है । इनके
प्रयोग से गर्भ के पीड़ा की शान्ति होती है एवं गर्भवृद्धि को प्राप्त होता है ।

- प्रथम मास—मधुक, शाकबीज, पयस्या तथा सुरदारु ।
- द्वितीय मास—अश्मन्तक, कृष्ण तिल, ताम्रवल्ली एवं शतावरी ।
- तृतीय मास—वृक्षादनी, पयस्या, प्रियङ्गु या लता, उत्पल एवं सारिवा ।
- चतुर्थ मास—अनन्ता, सारिवा, रास्ना, पद्मा एवं मधुक ।
- पंचम मास—बृहतीद्वय, काश्मरी, क्षीरिशुङ्ग एवं त्वचा तथा घृत ।
- षष्ठम मास—पृश्निपर्णी, बला (भा.प्र.-वचा), शिग्रु, श्वदंष्ट्रा तथा मधुपर्णिका ।
- सप्तम मास—शृंगाटक, बिस, द्राक्षा, कशेरु, मधुक तथा शक्कर या बला ।
- अष्टम मास—कपित्थ, बिल्व, बृहती, पटोल, इक्षु एवं निदिग्धिका के मूलों से सिद्ध दुग्ध का पान ।
- नवम मास—अनन्ता, सारिवा, पयस्या से सिद्ध क्षीर पान ।
- दशम मास—शुण्ठी एवं पयस्या से सिद्ध क्षीर अथवा शुण्ठी, मधुष्यटी एवं सुरदारु से सिद्ध क्षीर अथवा केवल पयस्या से सिद्ध क्षीर का पान ।
- एकादश मास—क्षीरिका, उत्पल, समझा-मूल तथा शिवा के कल्क को दुग्ध के साथ पान ।
- द्वादश मास—सिता, विदारी, काकोली, क्षीरी (वंशलोचन या क्षीरकाकोली) तथा मृणालिका को दुग्ध के साथ पान ।

गर्भपात प्रतिषेधार्थ वरणबन्ध

महर्षि काश्यप ने कल्पस्थान के रेवती कल्पाध्याय में गर्भिणी स्त्री को वरणबन्ध बाँधने का विधान बताया है । यह वरणबन्ध मंत्र-चिकित्सा का ही एक रूप है एवं इसमें मातंगी विद्या का प्रयोग बताया है ।

यह बन्ध गर्भिणी को आठवें मास के पूर्व ही बाँधना चाहिए । आठवें मास के पश्चात् इसके प्रयोग का निषेध है । यह बन्ध गर्भस्त्राव एवं गर्भपात के प्रतिषेध हेतु बाँधा जाता है ।

गर्भशोष या वातभिपन्न गर्भ या वातोदर

आहारमाप्नोति यदा न गर्भः, शोषं समाप्नोति परिस्त्रुतिं वा । तं स्त्री प्रसूते सुचिरेण गर्भं, पुष्टो यदा वर्षगणैरपि स्यात् ॥ (च.सं.शा. 2/15)

वाताभिपन्न एव शुष्यति गर्भः । स मातुः कुक्षिं न पूरयति मन्दं स्पन्दते च ॥ (सु.सं.शा. 10/62)

यदा तून्मार्गगो वातो गर्भस्य रसवाहीनि स्रोतांसि शोषयति तदा वातरोगी हीनो जायते । बहूनि च वर्षाण्युदरे तिष्ठति ॥ (अ.सं.शा. 2/37)

निदान

- गर्भ को उचित आहार नहीं प्राप्त होना ।
- गर्भधान होने के बाद भी योनि से रक्तस्त्राव होना ।
- वात से आक्रांत होना ।
- गर्भ की नाड़ी में रस का वहन न होना या अल्प वहन होना ।

- गर्भ को समय पर भोजन न मिलना ।
- उन्मार्गगामी (प्रकुपित) वायु द्वारा गर्भ के रसवाही स्रोतों को सुखा देना ।

लक्षण

- गर्भ सुख जाता है ।
- माता के कुक्षि का पूरण नहीं करता है ।
- मन्द-मन्द स्पन्दन करता है ।
- गर्भ वातरोगी एवं हीन हो जाता है ।
- वर्षों के बाद भी पुष्ट हुए गर्भ को स्त्री चिरकाल के बाद प्रसवित करती है अथवा गर्भ बहुत वर्षों तक उदर में ठहरता है ।
- डल्हण ने मन्द मन्द स्पन्दन का कारण गर्भ के वात से आक्रान्त होने के कारण ओज का विरहित होना माना है ।

आचार्य भेल के अनुसार जब वायु योनि-गत शुक्र को ग्रहण कर लेती है एवं उसी शुक्र तथा शुद्ध आर्तव के समन्वय से स्त्री को गर्भ धारण हो जाता है तब यदि रक्त स्राव होता है तो गर्भ का नाश हो जाता है, उसे वातोदर कहते हैं ।

चिकित्सा

- रुक्ष पदार्थों का परित्याग ।
- बृंहणीय औषधि, दुग्ध एवं मांसरस का प्रयोग ।
- मधुयष्टी, काश्मरी-फल, शारिवा एवं शर्करा से शृत दुग्ध पान ।
- मांसाहारी प्राणियों के मांसरस में बृंहणीय औषधियाँ एवं स्नेह मिलाकर सेवन ।
- सिता, काश्मरी एवं मधुक से सिद्ध दुग्ध का पान ।
- लीन गर्भ वर्णित चिकित्सा का प्रयोग ।

उपविष्टक गर्भ

यस्याः पुनरुष्णातीक्ष्णोपयोगाद्गर्भिण्या महति संजातसारे गर्भे पुष्पदर्शनं स्यादन्यो वा योनिस्त्रावस्तस्या गर्भो वृद्धिं न प्राप्नोति निःस्रुतत्वात्, स कालमवतिष्ठतेऽतिमात्रं, तमुपविष्टकमित्याचक्षते केचित् । (च.सं.शा. 8/26)

यस्याः पुनर्महति जातसारे गर्भे.....प्राप्तात्परिमाणादपरिहीयमान एव स्फुरति न च कुक्षिर्विवर्धते तमुपविष्टकमित्याचक्षते ॥ (अ.सं.शा. 4/11-12)

सञ्जातसारे	महति	गर्भे	योनिपरिस्त्रवात् ।
वृद्धिमप्राप्नुवन्	गर्भः	कोष्ठे	तिष्ठति सस्फुरः ॥
उपविष्टकमाहुस्तं,	वर्धते	तेन	नोदरम् ।

(अ.ह.शा. 2/14-15)

निदान

- बड़ा एवं संजातसार गर्भ हो जाने के बाद गर्भिणी द्वारा उष्ण, तीक्ष्ण आदि द्रव्यों के प्रयोग से पुष्पदर्शन (रजःस्राव) ।
- अन्य किसी भी प्रकार का योनि से स्राव होने पर निःस्रुति के कारण ।
- गर्भिणी स्त्री को थोड़ा-थोड़ा परन्तु निरन्तर रक्तस्राव के कारण ।

वृद्ध वाग्भट ने उपविष्टक एवं उपशुष्क गर्भ दोनों के सामान्य निदान एवं सम्प्राप्ति का वर्णन में लिखा है, कि जब गर्भिणी स्त्री द्वारा गर्भ के जातसार हो जाने के बाद भी परित्याज्य आहार एवं विहार न पालन करने के कारण योनि में पुष्प-दर्शन या अन्य प्रकार का स्राव होता है, तब प्रकुपित हुआ वायु पित्त एवं श्लेष्मा को लेकर गर्भ की रसवहा नाड़ी को प्रतिपीड़ित करता है । जिससे गर्भ में तृण-पत्र से प्रतिच्छत्र (रुकावट उत्पन्न की हुई) कुल्या के सदृश गर्भ की रसवहा नाड़ी में रस के असम्यक् वहन के कारण गर्भ वृद्धि को प्राप्त न होता हुआ उपविष्टक या उपशुष्क हो जाता है ।

लक्षण

- गर्भ की वृद्धि नहीं होती ।
- कुक्षि की वृद्धि नहीं होती ।
- वह गर्भ गर्भाशय में अतिकाल तक बना रहता है ।
- गर्भ उतना ही बड़ा बना रहता हुआ स्फुरण करता है ।

टीकाकार अरुणदत्त ने संजातसार अथवा बलवान् गर्भ की वृद्धि होने के बाद (अर्थात् पाँचवें या छठे मास के बाद) इस अवस्था के होने का निर्देश किया है

नागोदर या उपशुष्क गर्भ

उपवासव्रतकर्मपरायाः पुनः कदाहारायाः स्नेहद्वेषिण्या वातप्रकोपणोक्तान्यासेवमानाया गर्भो वृद्धिं न प्राप्नोति परिशुष्कत्वात्; स चापि कालमवतिष्ठतेऽतिमात्रम्, अस्पन्दनश्च भवति, तं तु नागोदरमित्याचक्षते ॥ (च.सं.शा. 8/26)

शुक्रशोणितं वायुनाऽभिप्रपन्नमवक्रान्तजीवमाध्मापयत्युदरं, तं कदाचिद्यदृच्छयोपशान्तं नैगमेषाहतमिति भाषन्ते, तमेव कदाचित् प्रलीयमानं नागोदरमित्याहुः, तत्रापि लीनवत् प्रतीकारः ॥ (सु.सं.शा. 10/57)

यदा तु प्रतिमासमार्तवं प्रत्यहं वा परिस्त्रवणं नात्यल्पं च तथा परिहीयमाणो गर्भश्चिरात्किञ्चित्स्पन्दते। कुक्षिश्च वृद्धोऽपि परिहीयते तदुपशुष्ककं नागोदरं च ॥ (अ.सं.शा. 4/13)

शोकोपवासरुक्षाद्यैरथवा.....। उदरं वृद्धमप्यत्र हीयते स्फुरणं चिरात् ॥ (अ.ह.शा. 2/15-ic)

आचार्य सुश्रुत के अनुसार वायु से पीड़ित शुक्र एवं शोणित जीवात्मा की अवक्रान्ति होने के बाद उदर का आध्मान उत्पन्न करते हैं । वह कभी अपने आप शान्त हो जाने पर नैगमेषापहत कहलाता है तथा कभी प्रलीयमान होने पर 'नागोदर' कहलाता है ।

निदान

- उपवास एवं व्रत परायण ।
- कुत्सित (दूषित) भोजन सेवन ।
- स्नेहद्वेषी (भोजन एवं पान में स्नेह द्रव्यों का प्रयोग न करना) अथवा रूक्ष अन्नपान सेवन ।
- वात प्रकोपक आहार-विहार का सेवन ।
- शोक ।
- गर्भिणी स्त्री को प्रतिमास या प्रतिदिन अनल्प (अधिक) मात्रा में आर्तव स्रवित होना ।

लक्षण

- गर्भ शुष्क हो जाता है ।
- गर्भ वृद्धि को नहीं प्राप्त होता है ।
- उदर की वृद्धि भी घटती है ।
- गर्भ उदर में अतिकाल तक अर्थात् बहुत दिन तक ठहरता है ।
- वायु से पीड़ित एवं जीवात्मा के द्वारा परित्यक्त गर्भ कठिन होकर (भावमिश्र), क्वथित होकर या सड़कर (योगरत्नाकर) गर्भाशय में ठहरता है ।
- आचार्य भेल के अनुसार असम्पूर्ण होने के कारण नाग (हाथी के गर्भ) की तरह वर्षों तक गर्भाशय में स्थित रहता है ।
- गर्भ में स्पन्दन नहीं होता है (चरक), बहुत देर से एवं थोड़ा-थोड़ा स्पन्दन होता है (वृद्ध वाग्भट), देर से स्फुरण होता है (वाग्भट) ।

उपविष्टक गर्भ एवं उपशुष्क गर्भ की समानताएँ

उपविष्टक गर्भ	उपशुष्क गर्भ
1. यह स्थिति संजातसार होने पर अर्थात् चौथे माह के बाद की है ।	1. यह स्थिति भी चौथे माह के बाद की है ।
2. योनिमार्ग से रक्तस्राव होता है ।	2. योनिमार्ग से रक्तस्राव होता है ।
3. गर्भ की रसवह नाड़ी में अवरोध होता है ।	3. गर्भ की रसवह नाड़ी में अवरोध होता है ।
4. कुक्षिवृद्धि नहीं होती ।	4. कुक्षि वृद्धि नहीं होती ।

उपविष्टक गर्भ तथा उपशुष्क गर्भ में असमानताएँ

उपविष्टक गर्भ	उपशुष्क गर्भ
1. गर्भ अपने प्राप्त परिणाम से नहीं घटता है ।	1. गर्भ अपने प्राप्त परिणाम से घट जाता है ।
2. कुक्षिवृद्धि उतनी ही रहती है ।	2. कुक्षिवृद्धि पहले से घट जाती है ।
3. गर्भस्फुरण सामान्य होता है ।	3. गर्भस्फुरण देर से होता है ।

उपविष्टक एवं उपशुष्क गर्भ में वात प्रकोप होने पर लक्षण

उपविष्टक एवं उपशुष्क में वात के प्रकोप होने पर गर्भिणी स्त्री में निम्न लक्षण उत्पन्न हो जाते हैं—

- शब्द के साथ फेनयुक्त फटा हुआ सा मल-त्याग
- मूत्रावरोध
- कटि, पृष्ठ एवं हृदय प्रदेश में वेदना
- जृम्भा
- निद्रानाश
- अत्यधिक प्रतिश्याय
- शुष्क कास
- अंगसाद
- कर्ण में कण्डु सदृश अनुभूति
- शंखप्रदेश में सुई चुभाने सदृश वेदना
- शरीर में पिपीलिका चलने सदृश अनुभूति
- कुक्षि में वायु घूमती है
- तम-प्रवेश सदृश प्रतीति होती है
- अन्न का कष्ट से पाचन होता है
- शरीर का धीरे-धीरे क्षय होता है
- त्वचा स्फुटित, विवर्ण एवं कठोर हो जाती है ।

उपशुष्क एवं उपविष्टक गर्भ में पित्त का प्रकोप होने पर लक्षण

उपशुष्क एवं उपविष्टक गर्भ में पित्त का प्रकोप होने पर गर्भिणी स्त्री में निम्न लक्षण उत्पन्न होते हैं—

- ताम्र एवं हरित वर्ण का मलत्याग
- धूम सदृश प्रतीति
- अम्ल-छर्दि
- मूर्च्छा
- कुक्षि तथा हृदय प्रदेश में दाह
- नेत्र, मूत्र एवं नख का पीतवर्ण या रक्तवर्ण या गोमूत्र के सदृश होना
- त्वाचा का कालापन
- दुर्बलता तथा नित्यप्रति शूल आदि ।

उपशुष्क एवं उपविष्टक गर्भ में श्लेष्मा का प्रकोप होने पर लक्षण

उपशुष्क एवं उपविष्टक में श्लेष्मका प्रकोप होने पर गर्भिणी स्त्री में निम्न लक्षण उत्पन्न होते हैं—

- मुख में मधुरता
- उत्क्लेश
- श्लेष्मा का वमन
- भोजन में अरुचि
- हाथ, पैर एवं नेत्रों का श्वेत वर्ण
- कास तथा श्वास आदि ।

उपशुष्क एवं उपविष्टक गर्भ का प्रसव काल

उपविष्टक एवं उपशुष्क दोनों माता के आहार के तेज (अग्नि) से धीरे-धीरे बढ़ते हुए जब पुष्ट होते हैं तो केश, दशनादि युक्त उन्हें स्त्री वर्षों के बाद भी प्रसवित करती है । इन्दु के अनुसार अधिक दिन तक गर्भाशय में रहने के कारण गर्भ के केश, दशन आदि निकल आते हैं ।

आचार्य भेल के अनुसार गर्भिणी के आहार-रस से पोषित होकर वह गर्भ जब भी सम्पूर्ण गात्र का हो जाता है, तभी स्त्री की कुक्षि से विच्युत होकर उसका प्रसव हो जाता है ।

उपशुष्क एवं उपविष्टक की चिकित्सा

- आचार्य सुश्रुत ने लीन गर्भवत् चिकित्सा करने का निर्देश दिया है ।
- आचार्य भावमिश्र एवं योगरत्नाकर ने धान्य कुट्टन ही मुख्य चिकित्सा बताया है ।
- भूताधिकार में वर्णित घृत यथा वचाघृत, गुग्गुल्वादिघृत, महापैशाचिक घृत का प्रयोग ।
- भूख लगने पर या भोजन के साथ भी उपर्युक्त घृत आदि का प्रयोग ।
- जीवनीय-बृंहणीय-मधुर तथा वातहर औषधियों से सिद्ध क्षीर, घृत, मांस रस का प्रयोग ।
- क्षीर, मांसरस तथा आमगर्भ (भ्रूण या अण्डे) का प्रयोग ।
- वातघ्न, बृंहण एवं मधुर द्रव्य यथा द्राक्षा एवं शर्करा आदि का प्रयोग ।
- भोजन आदि से तृप्त होकर बार-बार यान, वाहन आदि का प्रयोग तथा क्षोभण एवं मार्जन, जृम्भण आदि का प्रयोग ।
- स्त्री को बार-बार प्रसन्न करने से गर्भ की वृद्धि होती है ।
- न बढ़ते हुये उपशुष्क एवं उपविष्टक गर्भ का तीक्ष्ण, विरेचनीय एवं अपरा-पातनीय द्रव्यों के प्रयोग द्वारा भ्रतन करा देना चाहिए ।

उपविष्टक गर्भ तथा उपशुष्क गर्भ में वात की अधिकता होने पर चिकित्सा

इन स्थितियों में वाताधिक्य होने पर निम्न चिकित्सा करें—

1. सैन्धव मिश्रित दूध की बस्ति देकर शीतल जल से स्नान की हुई स्त्री को शालि ओदन का भोजन करायें ।
2. विदार्यादिगण से सिद्ध घृत की अनुवासन बस्ति दें ।

3. वायु के जहाँ तीव्र झोंके न आते हों, ऐसे स्थान पर स्त्री को रखें ।

उपविष्टक गर्भ एवं उपशुष्क गर्भ में पित्ताधिक्य होने पर चिकित्सा

1. मधुक, विदारी के स्वरस या क्वाथ से सिद्ध दुग्धपान करायें ।
2. अजा सर्पि, अजा क्षीर एवं जीवनीय गण के द्रव्यों से साधित यवागू का प्रयोग करायें ।
3. पयस्या, दोनों काकोली तथा सुनिषण्णक के कल्क से दूध के साथ घृतपाक करें । इसे प्रातःकाल क्षीर के अनुपात से अथवा आम गर्भ (अण्डे) के रस के साथ सेवन करें ।

उपविष्टक एवं उपशुष्क गर्भ में कफाधिक्य होने पर चिकित्सा

1. आनूप जल बहुल स्थान में रहनेवाले और जलचर प्राणियों के मांस को भोजन के साथ खाये एवं अवस्था के अनुसार अच्छा सुरा का तीन, पाँच या सात दिन तक पान करें ।
2. तिल, मूँग, माष, लवण और बिल्वफल के चूर्ण को घी के साथ मिलाकर रख लें । प्रातःकाल गरम करके ठण्डे किये बकरी के दूध के साथ दो तोले की मात्रा में सेवन करें ।
3. उपरोक्त चूर्ण में बेर का चूर्ण भी मिला दें ।

लीन गर्भ

.....गर्भःप्रसुप्तो न स्पन्दते.....। (च.सं.शा. 8/28)

वातोपद्रवगृहीतत्वात् स्रोतसां लीयते गर्भः, सोऽतिकालमवतिष्ठमानो व्यापद्यते । (सु.सं.शा. 10/61)

यस्याः पुनर्वातोपसृष्टस्रोतसि संलीनो गर्भः प्रसुप्तो न स्पन्दते तं लीनमित्याहुः ॥ (अ.सं.शा. 4/23)

लीनाख्ये निःस्फुरे.....। (अ.ह.शा. 2/18)

निदान

- स्रोतों के वात के उपद्रवों से पीड़ित होने के कारण गर्भ के निर्गम मार्ग के स्रोतस् संकुचित हो जाते हैं ।

लक्षण

- गर्भ सुप्त (अत्यधिक शिथिल) हो जाता है ।
- गर्भ स्पन्दन नहीं करता (चरक, वृद्ध वाग्भट), निःस्फुर (वाग्भट्ट) होता है ।
- वह अधिक काल तक गर्भाशय में रहता हुआ कष्ट को प्राप्त करता है या मर जाता है ।
- वह गर्भ लीन या स्रोतों में चिपक जाता है ।

लीन गर्भ का प्रसवकाल

पुष्टोऽन्यथा वर्षगणैः कृच्छ्राज्जायेत, नैव ॥ (अ.ह.शा. 2/21)

पुष्ट होकर सामान्य समय पर अन्यथा वर्षों के उपरान्त अत्यधिक कष्ट से उत्पन्न होता है या कभी-कभी नहीं भी उत्पन्न होता अर्थात् आजीवन गर्भिणी के कुक्षि में ही रहता है ।

तीन गर्भ की चिकित्सा

- मृदु स्नेहादि क्रम से उपचार अर्थात् मृदु स्वेदन, वमन, विरेचन आदि में भी स्नेह द्रव्यों का प्रयोग ।
- श्येन (बाज), मत्स्य, गवय, शिखि (मयूर), ताम्रचूड़, तित्तिर या अन्य पक्षियों का मांस रस एवं घृत अथवा माष-यूष अथवा अधिक मात्रा में घृत एवं मूली के यूष के साथ रक्तशाली के मृदु, मधुर तथा शीतल भात का भोजन ।
- केवल उत्क्रोश मांस-रस से साधित अनल्प (अधिक) स्नेह युक्त यवागू का पान ।
- मेघ मांस अकेला या उपदंश (भोजन में रुचि के लिए साथ में मिलाई गई वस्तु) के साथ सेवन ।
- माष, तिल, बिल्व-शलाटु से साधित कुल्माष का सेवन ।
- माध्वीक-मधु सात रात्रि तक पान ।
- उपविष्टक एवं उपशुष्कान्तर्गत वर्णित चिकित्सा का प्रयोग ।
- स्त्री को बार-बार प्रसन्न करना ।
- ईषत् उष्ण तैल से उदर, बस्ति, वंक्षण, उरु, कटि, पार्श्व एवं पृष्ठ प्रदेश में बार-बार अभ्यंग ।
- विशेषकर कालातीतस्थायी गर्भ में धान्य-युक्त उद्खूल को मसूल से कूटना या विषम यान एवं आसन का सेवन करना ।

गर्भक्षय

लक्षण

गर्भक्षये गर्भास्पन्दनमनुन्नतकुक्षिता च । (सु.सं.सू. 15/16)

- गर्भ का स्पन्दन न होना
- कुक्षि का अनुन्नत (नीचा) होना ।
- गर्भक्षय पीड़ित गर्भिणी मृग, अजा, आवि तथा वराह के सुसंस्कृत गर्भों के मांस, वसा या अनेक प्रकार के भुने हुए मांस आदि खाने की इच्छा करती है ।

चिकित्सा

तत्र प्राप्तवस्तिकालायाः क्षीरवस्ति प्रयोगो मेद्यान्नोपयोगद्येति ॥

(सु.सं.सू. 15/16)

- बस्ति-काल प्राप्त होने पर अर्थात् आठवाँ महीना हो जाने पर क्षीर-वस्ति का प्रयोग ।
- मेघ अन्न (स्निग्ध अन्न या वृष्य अन्न) का प्रयोग ।
- क्षीणता (किसी दोष, धातु या मल की) से पीड़ित स्त्री जो-जो खाने की इच्छा करे वह देना। जैसे उपर्युक्त मृः, अजा, आदि वसा या अनेक का सेवन कराना ।

लक्षण

गर्भो जठरादिभिवृद्धिं स्वेदं च ॥ (सु.सं.सू. 15/21)
स्यात्प्रसवे व्यसनं महत् ॥ (भा.प्र.पूर्व. 7/73)

- उदर की अति वृद्धि
- अधिक स्वेद
- प्रसव में महान कष्ट

चिकित्सा

- यथायोग्य सात्म्य, संशोधन तथा संशमन आहार-विहार द्वारा चिकित्सा ।
- क्षय के अविरुद्ध अर्थात् वृद्ध दोष या धातु का क्षय न करते हुए केवल बढ़ी हुई मात्रा के हासकारक आहार, विहार एवं औषध का प्रयोग ।

वातोदर

कदाचिद्वा गर्भ इव वातोदरं भवति तद्वातोपशमनैरुपशाम्यति ॥

(अ.सं.शा. 1/15)

कभी-कभी गर्भ के ही समान (उदर को बढ़ाने वाला) वातोदर हो जाता है जो वातशामक चिकित्सा करने पर शान्त हो जाता है ।

भूतहत या नैगमेषहत गर्भ

आचार्य चरक एवं वाग्भट ने भूतहत गर्भ का वर्णन अलग से किया है । आचार्य सुश्रुत, भावमिश्र एवं योगरत्नाकरकार ने नागोदर के ही साथ नैगमेष या नैगमेषहत गर्भ का वर्णन किया है । आचार्य काश्यप ने रक्तगुल्म में भेदन के बाद गर्भ के अदृश्यमान होने को 'दिव्य गर्भ या परिप्लुत गर्भ' माना है ।

वायु के द्वारा रुका हुआ आर्तव गर्भाशयान्तर्गत बढ़कर गर्भ के लक्षणों (अनार्तव, स्तन परिवर्तन, कुक्षिवर्धन आदि) को उत्पन्न कर देता है । वह रुका हुआ आर्तव अग्नि, सूर्य, श्रम, शोक, रोग अथवा उष्ण अन्नपान के प्रयोग से योनिमार्ग से बाहर निकलने लगता है । केवल रक्त को ही देखकर एवं गर्भ को न देखकर कुछ लोग उसे भूतहत (गर्भ का भूतों द्वारा हरण) कहने लगते हैं ।

महर्षि सुश्रुत के अनुसार वायु से पीड़ित शुक्र-शोणित जीवात्मा की अवक्रान्ति (संयोग) होने के बाद उदर का आध्मान कर देते हैं, वह (आध्मान) कभी-कभी अपने आप शांत हो जाने पर नैगमेषापहत कहलाता है ।

अष्टांगसंग्रह में वर्णन है कि वही आर्तव कभी-कभी सौम्य, वृंहण एवं आत्मानुकूल आहार-विहार के प्रयोग के कारण स्तम्भित होकर उदर (गर्भाशय) को गर्भाधान की तरह ही बढ़ाता है । इस प्रकार की गर्भ रहित स्त्री को अज्ञानी लोग गर्भिणी कहते हैं । वह रुका हुआ आर्तव विपरीत (सौम्य एवं वृंहण के विपरीत) द्रव्यों के प्रयोग या इच्छा के

हरण प्रवृत्त होता है तो गर्भ शरीर को न देखने के कारण भूत ने हरण कर लिया ऐसा कहते हैं।

आचार्य काश्यप ने वर्णन किया है कि यदि किसी कारण से उस रक्त गुल्म का भेदन हो जाता है तो लोग उस स्त्री को गुल्म से मुक्त हुई समझते हैं। अर्थात् यदि रक्त गुल्म किसी कारण से पककर फटजाये तो उसका स्राव बह जाता है जिससे लोग यह समझने लगते हैं कि उसका गुल्म नष्ट हो गया है। जब वह स्त्री इसी प्रकार चिरकाल तक गर्भिणी (गर्भिणी के लक्षणों से युक्त होने के कारण अपने आप को गर्भिणी समझने वाली) रहती है और उसके बाद शोणित (रक्तगुल्म का रक्त) निकल जाता है तब गर्भ के नहीं दिखाई देने पर उसे बड़ा भारी सन्देह होने लगता है। इस आश्चर्यजनक बात को देखकर अज्ञानी लोग उसे कहते हैं कि तुम्हारी जो दिव्य गर्भ उत्पन्न हुआ था, नैगमेष ने उसका हरण कर लिया है। जितनी अशुभ बातें थी उन सबका हरण हो गया है तथा जो कुशल एवं ज्ञानी लोग हैं वे उसे परिप्लुत करते हैं।

चिकित्सा— आचार्य सुश्रुत ने लीनगर्भवत् तथा आचार्य भावमिश्र एवं योगरत्नाकरकार ने धान्य-कुट्टन ही मुख्य चिकित्सा बताई है।

जरायुदोष

.....विकृतजरायुणा छादनं जरायुदोषः ।.....अर्याद्वर्भश्ध्यायां स्थितो यो बालस्तरयोपरि वेष्टितोल्पविकारत्वाज्जरायुदोष इत्यभि प्रायः ॥ (शा.सं.पू. 7/182, आढ. टीका)

गर्भ के आवेष्टन रूप विशिष्ट चर्म को जरायु कहते हैं। विकृत जरायु के द्वारा गर्भ का आच्छादन होना जरायु-दोष कहा जाता है। गर्भाशय में स्थित गर्भ को आवेष्टित करने वाले जरायु में अल्प विकार होने पर उसे जरायुदोष कहते हैं।

मृतगर्भ

निदान

यस्याः पुनरतिमात्रदोषोपचयाद्वा तीक्ष्णोष्णातिमात्रसेवनाद्वा वातमूत्रपुरीषवेगविधारणैर्वा विषमाशा(स) नशयनस्थानसंपीडनाभिधातैर्वा क्रोधशोकेर्ष्याभयत्रासादिभिर्वा साहषैर्वाऽवपरैः कर्मभिरन्तःकुक्षेर्गर्भो म्रियते ।
(च.सं.शा. 8/30)

- दोषों के अत्यधिक संचित होना
- तीक्ष्ण-उष्ण द्रव्यों का अति सेवन
- वात-मूत्र-पुरीष के वेगों का धारण
- विषम आसन, शयन, खड़ा रहना
- उदर में दबाव पड़ना
- अभिघात
- क्रोध, भय, शोक, ईर्ष्या, त्रास आदि
- साहस

- अन्य कारण

इन्हीं कारणों को आचार्य सुश्रुत ने केवल दो भागों में बताया है—

मनसागन्तुभिर्मातुरुपतापैः

गर्भो व्यापद्यते कुक्षी

व्याधिभिश्च

प्रपीडितः।

प्रपीडितः ॥

(सु.सं.नि. 8/15)

- मानसिक उपताप

- आगन्तुक उपताप

महर्षि हारीत ने माता का निराहार रहना गर्भाशय में स्थित गर्भ की मृत्यु का कारण बताया है। भावमिश्र ने गर्भनाश को वात के अस्सी विकारों के अन्तर्गत माना है। अतः वात दोष का प्रकोप मृतगर्भ का मुख्य कारण है।

आचार्य सुश्रुत के मूढ़गर्भ निदानान्तर्गत ही गर्भाशयान्तर्मृतगर्भ का भी वर्णन किया है अतः जो निदान एवं सम्प्राप्ति मूढ़गर्भ के वर्णित हैं उन्हें मृतगर्भ हेतु भी समझनी चाहिए।

लक्षण

तस्याः स्तिमितं स्तब्धमुदरमाततं शीतमश्मान्तर्गतमिव भवत्यस्पन्दनो गर्भः, शूलमधिकमुपजायते, न चाव्यः प्रादुर्भवन्ति, योनिर्नप्रस्रवति, अक्षिणी चास्याः स्रस्ते भवतः, ताम्यति, व्यथते, भ्रमते, श्वसिति, अरतिबहुला च भवति, न चास्या वेगप्रादुर्भावो यथावदुपलभ्यते; इत्येवंलक्षणां स्त्रियं मृतगर्भेयमिति विद्यात् ॥ (च.सं.शा. 8/30)

- मृतगर्भा स्त्री का उदर स्तिमित, स्तब्ध, आतत (तना हुआ), शीतल, अश्मान्तर्गत सदृश हो जाता है।
- गर्भ में स्पन्दन नहीं होता है।
- अत्यधिक वेदना होती है।
- आवी का प्रारंभ नहीं होता।
- योनि से स्राव नहीं होता।
- नेत्र स्रस्त या शिथिल हो जाते हैं।
- तमप्रतिति, व्यथा, भ्रम, श्वास पीडित।
- अत्यधिक पीड़ा होती है।
- मलमूत्रादि के वेगों की उपस्थिति नहीं होती है।

गर्भास्पन्दनमावीनां

भवत्युच्छ्वासपतित्वं

प्रणाशः

शूलं

श्यावपाण्डुता ।

चान्तर्मृते

शिशौ ॥

- गर्भ के स्पन्दन का नाश।

- आवी का नाश।

(सु.सं.नि. 8:4)

- स्यावता या पाण्डुता।
- उच्छ्वास में पूति गंध।
- शूल।

वाग्भट द्वय ने भी इन्ही लक्षणों का वर्णन शब्दभेद से किया है साथ ही गर्भिणी स्त्री रात-दिन रोती रहती है, सोती नहीं, उसके धास में पूतिगन्धि एवं अति कष्ट होता है, बहुत ही कठिनाई से प्राण-धारण करती एवं कुछ भी खाती है, ऐसा बताया है। भावमिश्र एवं योगरत्नाकर ने आचार्य सुश्रुतानुसार ही वर्णन किया है।

चिकित्सा सिद्धान्त

तस्य गर्भशल्यस्य जरायुप्रपातनं कर्म संशमनमित्याहुरेके, मन्त्रादिकमथर्ववेदविहितमित्येके, परिदृष्टकर्मणा शल्यहर्त्रा हरणमित्येके । (च.सं.शा. 8/31)

- जरायु-पातनार्थ कर्म (अपरापातन में वर्णित चिकित्सा का प्रयोग)
- संशमन
- अथर्ववेद वर्णित मन्त्रादि कर्म
- अनुभवी शल्यहर्त्रा द्वारा शल्य का आहरण

चिकित्सा

व्यपगतगर्भशल्यां तु स्त्रियमामगर्भा सुरासीध्वरिष्टमधुमदिरासवानामन्यतममग्रे सामर्थ्यतः पाययेद्गर्भ-कोष्ठशुद्ध्यर्थमर्तिविस्मरणार्थं प्रहर्षणार्थं च, अतः परं संप्रीणनैर्बलानुरक्षिभिरस्नेहसंप्रयुक्तैर्यवाग्वादिभिर्वा। तत्कालयोगिभिराहारैरुपचरेद्दोषधातुक्लेदविशोषणमात्रं कालम् । अतः परं स्नेहपानैर्बस्तिभिराहारविधि-भिश्च दीपनीयजीवनीयबृंहणीयमधुरवातहरसमाख्यातैरुपचरेत् । परिपक्वगर्भशल्यायाः पुनर्विमुक्त-गर्भशल्यायास्तदहरेव स्नेहोपचारः स्यात् ॥ (च.सं.शा. 8/31)

आमगर्भा स्त्री का शल्य निकलने के बाद—

- गर्भकोष्ठ की विशुद्धि, अर्ति-विस्मरण तथा प्रहर्षण हेतु सुरा, सीधु, अरिष्ट, मधु, मदिरा तथा आसव आदि अन्य मद्य का स्त्री की समर्थ्य के अनुसार पान ।
 - दोष एवं धातु के क्लेद का विशोषण होने तक बल्य, बृंहण, स्नेहरहित यवागू पान ।
 - दीपनीयगण, जीवनीयगण, बृंहणीय गण, मधुर एवं वातहर द्रव्यों से साधित स्नेह का पान, स्नेह बस्ति (अनुवासन बस्ति) और आहार द्रव्यों के साथ इसी स्नेह का प्रयोग ।
- परिपक्वगर्भशल्य निकलने के बाद गर्भशल्य के विमुक्त होने के दिन से ही स्नेह का प्रयोग ।

रक्तगुल्म

अष्टगर्भ व्यापद् के समान रक्तगुल्म भी एक ऐसी व्याधि है जो गर्भ से सामंजस्य रखती है । गर्भाशय तथा आर्तव के आगमन की विशेषता के कारण स्त्रियों में ही होता है ।

जेज्जट के मतानुसार जो स्त्री गर्भ-ग्रहण-समर्थ होती है रक्तगुल्म उसी को होता है ।

गुल्मश्चय इति प्रोक्तो रक्तं रुधिरमुच्यते ॥
 रक्तस्य संचयस्तेन रक्तगुल्म इति स्मृतः ।
 गर्भवच्चेष्टते नायं किन्तु सादृश्यदर्शनात् ॥

(का.सं.खिल. 9/40-41)

रक्त अर्थात् रुधिर तथा गुल्म अर्थात् चय या इकट्टा होना इस प्रकार रक्त का संचय होने से इसे रक्तगुल्म कहते हैं ।

स्त्रियों में रक्तगुल्म का कारण

स्त्रीणां गर्भाशयोऽष्टमः ॥ (का.सं.खिल. 9/16)

रजोवहाः सिरा यस्मिन् रजः प्रविसृजन्त्यतः । पुष्पभूतं हि तद्दैवान्मासि मासि प्रवर्तते विपर्ययात्तदेवेह तत्रैव तु निचीयते ॥ (का.सं.खिल. 9/16-17)

स्त्रियों में आठवां आशय गर्भाशय होता है, जिसमें रजोवहा सिराएँ रज को लाकर डालती हैं। वही रज पुष्प (आर्तव) के रूप में दैववश प्रत्येक मास में प्रवृत्त होता है अर्थात् निकलता रहता है । यदि रोग या किसी अन्य कारण से प्रवृत्त न हो सके तो वह रज वहीं गर्भाशय में ही संचित होता रहता है ।

हीनयोऽन्यास्तु बालायाः कायं गच्छति शोणितम् ।

अथ पूर्णस्वभावायाः कायं योनि च गच्छति ॥

(का.सं.खिल. 9/19)

- बालिकाओं की योनि स्वल्प होने के कारण उनका सारा रक्त शरीर में चला जाता है ।
- तथा जिस स्त्री के शारीरिक अवयव पूर्ण हो चुके हैं उनका रक्त शरीर तथा योनि दोनों में जाता है अर्थात् कुछ रक्त जहाँ शरीर के पोषण में व्यय होता है वहाँ कुछ योनि में भी जाता है ।

यदा रक्तवहा रक्तं प्रदोषान्नानुपद्यते ।

विमार्गाद्योनिमन्वेति(विकृति) स्तेन जायते ॥

तथैव रक्तगुल्मोऽपि हेतुनाऽनेन जायते ।

(का.सं.खिल. 9/23-24)

दोषों के कारण जब रक्त रक्तवहा सिराओं में नहीं पहुंचता है तब वह विपरीत मार्ग में जाने से पुनः योनि में पहुंच जाता है जिससे विकार उत्पन्न हो जाते हैं । इस प्रकार कारण से रक्तगुल्म की उत्पत्ति होती है ।

रक्तगुल्म का निदान एवं सम्प्राप्ति

- जब ऋतुकाल में स्त्री लज्जा, भय अथवा मैथुन के कारण शरीर के अधो भाग में प्राप्त हुए वेगों को रोकती है ; अथवा उदीर्ण हुए अन्य कारणों से प्रकुपित हुआ वायु उस रक्त को लेकर स्रोतों में पहुंचता है ।
- ऋतुकाल में अहितकर आहार का सेवन ।
- ऋतुकाल में स्तम्भन और लेखन औषधियों का प्रयोग ।

- भय
- योनिदोष या अन्य योनिव्यापद
- नवप्रसूता, ऋतुमती अथवा योनिरोग पीडित स्त्री द्वारा वातल आहार-विहार का सेवन ।
- जिसका सद्यः गर्भपात हुआ हो उस स्त्री का वायु मिथ्योपचार के कारण प्रकुपित हो जाता है ।
- इस प्रकार प्रकुपित हुआ वायु रक्तसहित गर्भाशय में पहुंच कर रुककर वहां स्थिर हो जाता है । वह रुका हुआ रक्त तथा विषम (प्रकुपित) हुआ वायु रजोवहा सिराओं को घेरकर गर्भ के समान स्थित हो जाता है ।

रक्तगुल्म के लक्षण

केवलश्चास्यागुल्मः पिण्डित एव स्पन्दते, तामगर्भा गर्भिणीमित्याहुर्मूढाः । (च.सं.नि. 3/14)

य : स्पन्दते पिण्डित एव नाङ्गैश्चिरात् सशूलः समगर्भलिङ्गः ।

स रौधिरः स्त्री भव एव गुल्मो.....॥ (च.सं.चि. 5/19)

.....सरुजं सदाहं ।

पैतस्य लिङ्गेन समानलिङ्गं विशेषणं चाप्यपरं निबोध ।

न स्पन्दते नोदरमेति वृद्धिं भवन्ति लिङ्गानि च गर्भिणीनाम् ॥ (सु.सं.उ. 42/14,15)

दर्शयन् यानि रूपाणि तानि वक्ष्यामि सर्वशः । कासते शूल्यते चैव ज्वर्यतेऽथातिसार्यते ॥
मन्यते सर्वगात्राणि मूर्च्छितानि गुरूणि च । तमोऽस्या जायतेऽभीक्षणं कार्श्यं चैव निगच्छति ॥
वमत्यभीक्षणशो भुक्तमन्नं चास्यै न रोचते । जायन्ते चोदरे गण्डा नीलं चास्याः प्रदृश्यते ॥
स्तनान्तरं च नाभिश्च लोमराजी च मूर्च्छिता । औष्ठौ च कृष्णौ भवतस्तथैव स्तनचूचुकौ ॥
पयोधरौ प्रसिच्येते दोहदं च निगच्छति । नानारसान् प्रार्थयते निष्ठीवति मुहर्मुहुः ॥
शुभादुद्विजते गन्धाद्वर्णश्चास्याः प्रसीदति । गर्भिण्या यानि रूपाणि तानि संदृश्य तत्त्वतः ॥
वर्षाणि हरति व्याधिं गर्भोऽयमिति दुःखिता ॥ (का.सं.खि. 9/30-36)

- वह गुल्म पिण्ड रूप में देर से स्पन्दन करता है ।
- हस्त-पाद आदि अङ्गों की फरकाहट नहीं होती है ।
- शूल होता है एवं प्रायः गर्भ के सभी लक्षण स्पष्ट होते हैं ।
- पीड़ा, दाह एवं पित्तज गुल्म सदृश लक्षण ।
- आचार्य सुश्रुत ने स्पन्दन नहीं होना एवं उदर की वृद्धि नहीं होना बताया है ।
- कास, शूल, ज्वर, अतिसार, छर्दि, अरोचक, अविपाक ।
- अंगमर्द, निद्रा, आलस्य
- शरीर मूर्च्छित तथा भारी प्रतीत होना ।
- आंखों के सामने अन्धकार दिखाई देना ।

- शरीर कृश हो जाना ।
 - निरन्तर वमन होना ।
 - पेट में गांठें दिखना, शरीर नीला हो जाना ।
 - ओष्ठ तथा स्तनों के चूचक काला पड़ जाना ।
 - स्तनों से दूध निकलना ।
 - दौहद उत्पन्न होना, नानाप्रकार के अम्ल आदि रसों की इच्छा ।
 - गर्भिणी के अन्य लक्षण जैसे— पादशोफ, रोमराजि उद्गम, योनि चाटालत्व इत्यादि ।
- इस प्रकार के लक्षणों के साथ वह स्त्री अपने आप को गर्भिणी समझने लगती है तथा गर्भ के समान इसकी रक्षा करती है ।

रक्तगुल्म में दौहद का कारण

जो रस धातुओं की वृद्धि करने वाले होते हैं, उत्पत्ति धर्म की समानता के कारण प्रायः उन्हीं रसों की ही स्त्री को उस समय इच्छा होती है ।

रक्तगुल्म में स्तनों में दुग्ध उत्पत्ति का कारण

गर्भ के प्रति प्रीति एवं प्रेम के संकल्प के कारण स्त्री में स्त्रावों की उत्पत्ति होती है ।

रक्तगुल्म में पाण्डुता का कारण

रसवहा सिराओं का पीडन होने से शरीर में रस ठीक प्रकार से नहीं पहुंचता है । इसीलिये सारे शरीर में पाण्डुता तथा गण्डता हो जाता है ।

रक्तगुल्म तथा गर्भ में अन्तर

1. गर्भ अङ्गप्रत्यङ्गों से युक्त हुआ उन्हीं के द्वारा चेष्टा करता है तथा रक्तगुल्म एक गोल ढेले या मांस की लोथ के समान चेष्टा करता है । अर्थात् गर्भ के तीसरे या चौथे मास में हाथ-पैर आदि की पिण्डिकायें प्रकट हो जाती हैं अतः यदि उसके बाद के महीनों में यदि माता के उदर का स्पर्श आदि के द्वारा परीक्षा करें तो हमें गर्भ के हाथ-पैर आदि की पिण्डिकाओं तथा समयानुसार अन्य भी अङ्गप्रत्यङ्गों का अनुभव होता है । जब कि रक्तगुल्म में गुल्म के इधर-उधर हिलने से चेष्टाएं तो अवश्य ही होती हैं परन्तु उसमें हाथ-पैर आदि के पृथक् अनुभव नहीं होते हैं अपितु अङ्ग-प्रत्यङ्गों से रहित केवल एक मांस के लोथड़े मात्र का ही अनुभव होता है ।

2. गर्भ एक स्थान से दूसरे स्थान पर गति करता हुआ व्याविद्ध दिखाई देता है जब कि गुल्म नाभि के नीचे अव्याविद्ध होकर स्थित होता है ।

3. गर्भ प्रतिदिन क्रमशः वृद्धि को प्राप्त होता है । इसके विपरीत गुल्म धीरे-धीरे बढ़ता है ।

4. गर्भ प्रत्येक मास में अपनी भिन्न-भिन्न अवस्था को प्राप्त करता है अर्थात् प्रत्येक मास में गर्भ की अवस्था थोड़ी

बहुत अवश्य बदलती रहती है तथा गर्भिणी को बिना किसी कारण के ज्वर तथा दाह नहीं होता है परन्तु गुल्मिनी (जिस स्त्री को रक्तगुल्म हो) को बिना किसी कारण के ही ज्वर तथा दाह हो जाता है ।

इन सब उपर्युक्त भेदों के होने पर भी अनेक गर्भसंबन्धी विकारों के मिल जाने से चिकित्सक को बड़ा भारी सन्देह हो जाता है । अर्थात् यद्यपि रक्तगुल्म तथा गर्भ की उपरिलिखित अनेक विभेदक पहिचान हैं तथापि कई बार गर्भ के अनेक लक्षणों के मिल जाने से रक्तगुल्म तथा गर्भ में भेद करना अत्यन्त कठिन हो जाता है ।

रक्तगुल्म के उपद्रव

ज्वरारुचिश्वासकासशोषकाश्र्यारतिव्यथाः

शोफश्चोपद्रवा गुल्मे तांश्चिकित्सेत् स्वभेषजैः ॥

(का.सं.खिल. 9/74)

गुल्म में ज्वर, अरुचि, श्वास, कास, शोष, कृशता, अरति (ग्लानि), पीड़ा तथा शोक आदि उपद्रव होते हैं ।

रक्तगुल्म की चिकित्सा सिद्धान्त

....मासे व्यतीते दशमे चिकित्स्यः ॥ (च.सं.चि. 5/19)

तं गर्भकालातिगमे चिकित्स्यमसृग्भवं गुल्ममुशन्ति तज्ज्ञाः ॥ (सु.सं.उ. 42/15)

रक्तेगुल्मे पुनरतीतप्रसवकालाया.....। (अ.सं.चि. 14/119)

- आचार्य चरक एवं काश्यप में दश मास के बाद तथा आचार्य सुश्रुत एवं वाग्भटद्वय ने प्रसव-काल व्यतीत हो जाने पर चिकित्सा का प्रयोग बताया है ।
- रक्तगुल्म की चिकित्सा 10 वें मास से पूर्व नहीं करना चाहिए क्योंकि रक्तगुल्म गर्भ के समान याप्य माना गया है । पकने पर (दसवें मास के बाद) उसका भेदन हो जाता है ।
- दसवें मास के बाद अनुवासन बस्ति और स्निग्ध एवं द्रव भोजन के द्वारा चिकित्सा करने से यदि वह गर्भ होगा तो सुखपूर्वक प्रसव हो जायगा और यदि वह रक्तगुल्म होगा तो उसका पूर्णरूप से भेदन हो जायगा ।
- रक्तगुल्म है या गर्भ है इस प्रकार का संशय उत्पन्न होने पर साधारण क्रिया करनी चाहिए ।

रक्तगुल्म की चिकित्सा

रौधिरस्य तु गुल्मस्य गर्भकालव्यतिक्रमे । स्निग्धस्विन्नशरीरायै दद्यात् स्नेहविरेचनम् ॥

(च.सं.चि. 5/172)

पित्तगुल्मार्दितं स्निग्धं काकोल्यादिघृतेन तु । विरिक्तं मधुरैर्योगैर्निरुहैः समुपाचरेत् ॥

पित्तवद्रक्तगुल्मिन्या नार्याः कार्यः क्रियाविधिः । विशेषमपरं चास्याः शृणु रक्तविभेदनम् ॥

(सु.सं.उ. 42/19.20)

रक्तगुल्मे प्रथमतो युक्त्या स्नेहोपपादनम् ॥

शस्तं बाहुसिरायाश्च वेधनं पाकवारणम् । तथा संशमनीयं च दोषशेषावकर्षणम् ॥

(का.सं.खि. 9. -70)

1. स्नेहन, स्वेदन के पश्चात् स्निग्ध विरेचन का प्रयोग
2. पित्तगुल्म के सदृश (काकोल्यादि घृत से स्नेहन देकर विरेचन एवं मधुर द्रव्यों से निर्मित निरुह बस्ति) चिकित्सा एवं रक्त का भेदन करना चाहिए।
3. गुल्म में पाक को रोकने के लिये हाथ की सिरा का वेधन।
4. बचे हुए दोषों को निकालने के लिये संशमन चिकित्सा का प्रयोग।
5. कल्याणक, पञ्चगव्य, षट्पल अथवा तिक्तक घृत का पान।
6. तीक्ष्ण द्रव्यों के द्वारा आस्थापन बस्ति देने के बाद युक्तिपूर्वक अनुवासन बस्ति का प्रयोग।
7. शूल तथा आटोप को दूर करने के लिये फल तैल के द्वारा अनुवासन बस्ति।
8. आस्थापन योग का प्रयोग (मधु और तैल समान मात्रा में तथा इन दोनों के समान उष्ण जल लें। इसमें दो कर्ष सौंफ तथा आधा कर्ष सैन्धव नमक डालकर उसके द्वारा अथवा दशमूल क्वाथ के द्वारा उसे आस्थापन बस्ति देना चाहिए। फिर संस्कारयुक्त मांसरस तथा दूध का प्रयोग करने से बल की वृद्धि होती है)।
9. रक्तगुल्म शोधन तथा पातन हेतु चूर्ण का प्रयोग— हरीतिकी, वचा, हींग, सैन्धवनमक, अम्लवेतस, अजवायन तथा यवक्षार के चूर्ण को उष्ण जल के साथ सेवन।
10. रक्तगुल्म के भेदन हेतु—
 - रक्तपित्तनाशक क्षार को मधु एवं घृत से साथ चटाना।
 - लशुन, तीक्ष्ण मदिरा और मत्स्य का प्रयोग।
 - तीक्ष्ण एवं उष्ण औषधियों का प्रयोग।
 - तिल के क्वाथ में घृत गुड, व्योष तथा भार्ज्जी का चूर्ण मिलाकर पान।
 - अर्क पुष्प को तैल में पकाकर सेवन।
 - हरीतिकी, यवक्षार तथा सौवर्चल नमक का युक्तिपूर्वक घृत के साथ सेवन।
 - तेजपत्र, पिप्पली तथा सोंठ के चूर्ण में विडलवण मिलाकर गोमूत्र से सेवन।
 - छोटी एला, कलौंजी, चव्य, पिप्पली तथा चित्रक के कल्क को बल्वज के यूष अथवा चावलों के मण्ड के साथ सेवन।
 - अपरा पातन के लिये प्रयुक्त होने वाली औषधियों के द्वारा भेदन।
11. भेदन के उपरान्त रक्तगुल्म में दोष शेष बच जाने पर आस्थापनोक्त विधि से चिकित्सा करनी चाहिए तथा अनुदन्ध की स्थिति में शनैःशनैः शोधन करना चाहिए।
12. रक्तगुल्म शिथिल करने के लिए बिल्व एवं श्योनाक क्वाथ से साधित जांगल पशु-पक्षियों के मांसरस का सेवन।
13. रक्तगुल्म में शोधनकर्म—मूल सहित पद्म आदि को जलाकर उसकी भस्म में सोंठ, पिप्पली, कुष्ठ, चव्य, दिक्क, देवदारु आदि का चूर्ण डालकर गाढ़ा क्वाथ बनाकर पान करें।
14. रक्तगुल्म नाशक योग— शिलाजीत तथा अभयारिष्ट कल्प।

15. वर्ति अथवा पिचु—

- यवक्षार अथवा सेंहुड़ के दूध के साथ पलल (तिल का कल्क) को योनि में धारण करने को दें ।
- यवक्षार तथा सेंहुड़ दुग्ध से भावित कटुक मत्स्य को योनि में धारण कराना चाहिए ।
- बाराह तथा मत्स्य के पित्त से भावित वस्त्र को योनि में धारण करायें ।
- किण्व, गुड़ एवं क्षार को मिलाकर वर्ति बनाकर योनि-विशोधन के लिए दें ।

शल्य-क्रिया द्वारा रक्तगुल्म का भेदन— यदि पूर्वोल्लिखित औषधियों द्वारा गुल्म का भेदन न हो तब शल्यक्रिया द्वारा भेदन करना चाहिए ।

पथ्य

- दूध, यूष, एवं मांसरस आदि का प्रयोग ।
- जांगल मांसरसों के द्वारा सिद्ध किये हुए बिल्व एवं श्योनाक के क्वाथ का पान ।
- कुलत्थ के यूष अथवा लाव के द्वारा संस्कारयुक्त त्रिवृत एवं त्रिफला का विरेचन हेतु प्रयोग करना चाहिए ।

अपथ्य

- रूक्ष, विदाही एवं गुरु अन्नपान, व्यायाम, मैथुन तथा चिन्ता ।

बह्वपत्यता

भिनत्ति यावद्बहुधा प्रपन्नः शुक्रार्तवं वायुरतिप्रवृद्धः।
तावन्त्यपत्यानि यथाविभागं कर्मात्मकान्यस्ववशात् प्रसूते ॥

(च.सं.शा. 2/40)

बीजेऽन्तर्वायुना भिन्ने द्वौ जीवौ कुक्षिमागतौ ।
यमावित्यभिधीयेते धर्मेतर-पुरःसरौ ॥

(सु.सं.शा. 2/37 एवं भा.प्र.पूर्व. 3/39)

शुक्रार्तवेऽनिलेन खण्डशो भिन्ने यथाविभागमपत्यानामुत्पत्तिः ॥

(अ.सं.शा. 2/6)

.....शुक्रार्तवे पुनः ।
वायुना बहुशो भिन्ने यथास्वं बह्वपत्यता ॥

(अ.ह.शा. 1/5-6)

एकमेव हि तद् बीजं भिन्नं वायुबलादथ ॥

(का.सं.क. 6/59)

निदान— शुक्रार्तव को गर्भाशय की अत्यन्त बड़ी हुई वायु जितने भागों में विभक्त करती है उतनी ही सन्तानें उत्पन्न होती हैं । यह पूर्वजन्म के कर्म के अनुसार होता है, स्त्री का अपना कोई वश नहीं होता ।

महर्षि सुश्रुत के अनुसार अधर्म के कारण गर्भाशयान्तर्गत वायु द्वारा बीज (शुक्रार्तव) के दो भागों में विभक्त होने पर दो जीव कुक्षि में आते हैं। टीकाकार डल्हण ने गयी के वाक्य को उद्धृत करते हुए अधर्म से ही यमलोत्पत्ति मानी है तथा श्रुति, स्मृति के आधार पर प्रायश्चित्त करने का भी उल्लेख किया है।

वाग्भटद्वय एवं टीकाकार इन्दु के अनुसार वायु के द्वारा शुक्रार्तव का जितने खण्डों में विभाग होगा उतने ही अपत्यों की उत्पत्ति होगी।

महर्षि काश्यप ने लिखा है कि बीज एक ही होता है उसे वायु (दो में) भिन्न कर देती है। महर्षि भेल ने वायु द्वारा कलल का विभाजन यमल-गर्भ की उत्पत्ति का कारण माना है एवं कुत्ते तथा वराह का उदाहरण देते हुए बहूपत्यता का भी वायु ही कारण माना है।

महर्षि हारीत के अनुसार दोष एवं धातु के एक साथ होने पर अंग-प्रत्यंग की उत्पत्ति होती है एवं भ्रांत-चित्त होकर मैथुन करते हैं, तो दोनों अर्थात् दोष-धातु के प्रभाव एवं भ्रांत-चित्तता से मन द्रवता है। तब यमल की उत्पत्ति देखी जाती है, जो दूसरे के चित्त को प्रसन्न करते हैं।

युग्म गर्भ में समानता होने का कारण

महर्षि काश्यप ने वर्णन किया है कि दोनों (यमल पुत्रों) के समान कर्म (वायु द्वारा विभाजन आदि), नाड़ी (रसवहा-नाड़ी) एवं जन्म, गर्भाधान प्रभृति से लेकर सम्पूर्ण गर्भ-वृद्धि एवं जन्म से ही स्तन-सेवन आदि तुल्य या एक समान होने से आयु, सुख, दुःख, भव (आरोग्य), अभव (रोग), लक्षण, आकृति, वर्ण, अंग, बल एवं प्रकृति आदि में समानता होती है। परन्तु दोनों के पृथक् होने से उनकी तृप्ति (पोषण) एवं विसर्ग (मल-मूत्रादि का विसर्जन) समान नहीं होता।

युग्म में लिङ्गोत्पत्ति का कारण

रक्तेन कन्यामधिकेन पुत्रं शुक्रेण तेन द्विविधीकृतेन ।
बीजेन कन्यां च सुतं च सूते यथास्वबीजान्यतराधिकेन ॥
शुक्राधिकं द्वैधमुपैति बीजं यस्याः सुतौ सा सहितौ प्रसूते ।
रक्ताधिकं वा यदि भेदमेति द्विधा सते सा सहिते प्रसूते ॥

(च.सं.शा. 2/12-13)

रक्त की अधिकता से कन्या एवं शुक्र की अधिकता से पुत्र उत्पन्न होता है। जब शुक्रार्तव मिश्रित बीज को वायु दो भागों में बाँटती है तो बीज के जिस भाग में शुक्र की अधिकता होगी उससे पुत्र एवं जिसमें आर्तव की अधिकता होगी तो उससे कन्या की उत्पत्ति होगी। जब वायु बीज का इस प्रकार विभाग करती है कि दोनों में शुक्र की ही अधिकता होती है तो दो पुत्र एक साथ उत्पन्न होते हैं। इसी प्रकार जब वायु बीज का ऐसा विभाग करती है कि दोनों में रक्त की ही अधिकता हो तो दोनों कन्यायें उत्पन्न होती हैं।

अचार्य भेल ने भी शुक्राधिक भाग से पुत्र एवं रक्ताधिक भाग से कन्या की उत्पत्ति मानी है।

टीकाकार अरुणदत्त ने महर्षि चरक के अनुसार वर्णन किया है, शुक्राधिक्य के गर्भ का वायु द्वारा विभाजन करने पर पुमान् तथा रजसाधिक्य-गर्भ के वायु द्वारा विभाजन से कन्या की उत्पत्ति होती है।

पुत्र में एक गर्भ की अधिक वृद्धि एवं एक की कम वृद्धि होने का कारण
 कर्मात्मकत्वाद्विषमांशभेदाच्छुक्रासृजोर्वृद्धिमुपैति कुक्षी ।
 एकोऽधिको न्यूनतरो द्वितीय एवं यमेऽप्यध्यधिको विशेषः ॥

(च.सं.शा. 2/16)

कर्म के वशीभूत होकर गर्भाशयगत शुक्रार्तव को वायु विषमांश में (एक अंश अधिक एवं दूसरा अंश छोटा) भेद करती हैं। जब गर्भाशय में गर्भ की वृद्धि होती है तो एक यमल विशेष रूप से पुष्ट एवं दूसरा न्यून होता है अर्थात् जो भाग बड़ा होता है उससे उत्पन्न गर्भ पुष्ट एवं बड़ा तथा जो जो भाग छोटा होता है उससे दुर्बल एवं छोटा गर्भ होता है।

Abortion

Definition

Abortion is the termination of pregnancy, spontaneous or induced, before the period of viability; which is now accepted as 20 weeks of gestation or a birth weight of 500 g. The expelled embryo or foetus is called abortus.

Types

1. Spontaneous :

- An abortion can occur spontaneously due to complications during pregnancy.
- Spontaneous abortion is beyond the patient's control.
- The spontaneous abortions are termed as miscarriages.
- A spontaneous abortion in its natural course goes through several stages -
 - a) Threatened abortion
 - b) Inevitable abortion
 - c) Incomplete abortion
 - d) Complete abortion
- Missed and septic abortions are also the type of spontaneous abortion.

2. Induced :

- An induced abortion to preserve the health of the pregnant female or due to foetal disease is termed a therapeutic abortion.
- An induced abortion for any other purpose is termed as elective abortion. Induced abortion may be legal (MTP) and illegal (criminal-common).
- Medications and surgical procedures are used to induce abortion.

Depending upon period of amenorrhoea abortion is of two types:

1. Early Abortion – That occurs before the 12th week
2. Late abortion – That occurs between the 12th and 20th week.

Etiology of abortion

1. Genetic factors

- Autosomal trisomy
- Polyploidy
- Monosomy
- Structural chromosomal rearrangement

2. Endocrine and metabolic factors :

- Luteal phase defect
- Deficient progesterone
- Thyroid abnormalities
- Diabetes mellitus

3. Anatomical factors :

- Cervical incompetence
- Congenital malformation of uterus
- Uterine fibroid
- Intra-uterine adhesions

4. Infections :

- Bacterial – Chlamydia, Brucella
- Viral – Rubella, Cytomegalo virus, Variola, HIV
- Parasite – Toxoplasma, Malaria

5. Immunological factors – Anti-nuclear antibody, Lupus anticoagulant, Anti-cardiolipin antibody and paternal human leukocyte antigens are responsible for abortion.

6. Others –

- Maternal medical illness
- ABO incompatibility – husband having A blood group with wife of O group.
- Inherited thrombophilia
- Smoking, alcohol intake, X-ray radiation
- IUCD in situ

7. Unexplained – In about 40-60% of cases the exact cause of abortion is not diagnosed.

Threatened abortion

Definition

Threatened abortion is the process of abortion which starts and can still be reversed to recovery and continuation of gestation.

Clinical features

- Bleeding p/v which usually precedes the onset of pain.
- Bleeding is usually slight and bright red.
- The amount of bleeding is variable but usually never heavy.
- Pain is usually not more than a mild discomfort at this stage.

Examination

- On vaginal examination, the uterus and cervix is soft and corresponding to the period of gestation and the internal os is closed.
- If the bleeding continues beyond a few days, even though not heavy, a speculum examination should be done to exclude local pathology like a polyp, erosion, or very rarely cervical malignancy.

Investigations

- Ultrasound confirms the diagnosis
- Serum progesterone value of 25 ng/ml or more indicates viable pregnancy.
- Serial serum chorionic gonadotrophin (hCG) level assessment.

Management

1. Rest
2. Drugs – striptics, Phenobarbitone 30 mg for relief of pain.
3. Patient should limit her activities for about 2 weeks and avoid heavy work and coitus.
4. Re-examination should be done after one month to assess the growth of foetus.

Inevitable abortion

Definition

Inevitable abortion is the one where the changes have progressed to such a state from where further continuation of pregnancy is not possible. Following the onset of bleeding, if intermittent uterine contractions occur that are painful, the abortion has most likely become inevitable.

Clinical features

- Bleeding increases significantly.

- Colour of blood is brighter and more profuse than in cases of ectopic gestation.
- Aggravation of lower abdominal pain.

Examination

On vaginal examination, the uterus is still felt soft and enlarged, but the internal os is open through which the products can be felt. If the products of conception can be withdrawn easily by means of a sponge forceps, further bleeding may cease and it is even possible that little other than decidual remnants may be found on subsequent curettage.

Investigations

- USG
- Haemogram to assess the loss of blood.

Management

1. Correction of blood loss by IV fluids and BT.
2. Methergin 0.2 mg – To control excessive bleeding when cervix is dilated and size of uterus is less than 12 wks.
3. Before 12 weeks – D&C or suction evacuation followed by curettage under general anaesthesia or by using analgesia.
4. After 12 weeks – Mini labour should be established by oxytocin drip.

Incomplete & Complete Abortion

Definition

Uninterrupted, an inevitable abortion for obvious reasons will proceed to discharge the products of conception outside the uterine cavity either partially as in an incomplete, or completely in mass as in complete abortion.

History

Passage of products of conception which may be described by the patient as fleshy bits.

Clinical features

Pain and bleeding which are prominent symptoms of an incomplete abortion usually settle down as the abortion becomes complete.

Examination

- The internal os is open on vaginal examination in case of an incomplete abortion
- Once all the products have been expelled out, the os gradually closes down and uterus can be felt to be much more firmer after a complete abortion.

- If the patient's general condition is worse that can be accounted by the estimated quantity of blood lost, other possibilities must be considered, especially haemoperitoneum.

Complications

In retained product of conception excessive bleeding, sepsis and placental polyp may occur.

Investigations

USG: reveals empty uterine cavity in complete type and retained product of conception in incomplete abortion.

Management

A. In incomplete abortion -

1. Before 12 weeks - D&E or suction evacuation followed by curettage under general anaesthesia or by using analgesia.
2. After 12 weeks - D&C under general anaesthesia.
3. In Rh negative patient anti-D gamma globulin 50 µg IM should be given after D&C.

B. In complete abortion

If uterine cavity is empty then no treatment should be required.

Anembryonic gestation (blighted ovum)

The term blighted ovum is used to describe the fertilised ovum whose development is arrested early in pregnancy. The fertilised ovum implants in the uterus, but the embryo does not develop. A blighted ovum is the cause of about 50% of first trimester miscarriages and is usually the result of chromosomal abnormalities. It differs from missed abortion largely in degree and particularly because of the absence of recognizable foetal parts.

Missed Abortion or Foetal Demise

In missed abortion, the embryo is dead and retained in uterus for weeks or months. There is bleeding in choriodecidual space.

Clinical Features

- Mild like those of threatened abortion, absence of usual signs of progress in pregnancy.
- Subsidence of pregnancy symptoms.
- Non-audibility of foetal heart sounds later in pregnancy.

- Size of uterus becomes smaller than period of amenorrhoea, os is closed and there may be brownish discharge through os.
- Patient may abort spontaneously.

Investigation

- USG does not show growth of foetus and FHS are absent.
- Routine investigations, bleeding time, clotting time and clot retraction time should be noted.
- Patients may develop hypofibrinogenaemia due to release of thromboplastins into maternal circulation if dead foetus is not expelled in 3-4 weeks time.

Management

1. If the above findings are deranged, then they should be corrected first by fresh blood transfusion before undertaking evacuation of uterus.
2. When uterus is less than 12 weeks size, suction evacuation can be done under sedation and paracervical block or general anaesthesia after arranging one unit of blood.
3. With more than 12 weeks size uterus, vaginal prostaglandins along with escalating doses of syntocinon or parenteral prostaglandin can be used to achieve spontaneous expulsion.
 - Syntocinon drip is started as 10 units. Syntocinon in glucose saline and after every 100 ml, 10 units of syntocinon is added till patient starts pains or syntocinon concentration of 100 units is reached. Intake and output chart should be maintained and drip should be discontinued for at least six hours in a day.
 - Vaginal suppository of prostaglandin E₂, 20 mg 3 hourly for four doses can be given or prostaglandin E₂ gel (Cerviprime) 5 mg may be applied to cervix, if there is no contraindication to prostaglandin (PG) use.
 - 15 methyl PG F_{2α} (carboprost) can be given in doses of 250 mg 3 hourly for maximum of 10 injections. It can cause vomiting and diarrhoea; this complication can be minimised by loperamide (2 mg tablet) 2 tabs three times daily.

Recurrent Abortion

When patient aborts spontaneously repeatedly 3 times or more before 20 weeks it is called as recurrent abortion. The patient should have detailed investigation to diagnose the cause.

Causes

First trimester abortion :

1. Parental chromosomal abnormalities

2. Diabetic patient
3. Presence of thyroid autoantibodies
4. Luteal phase defect-Less production of progesterone hormone
5. PCOS-Over production of luteinising hormone
6. Active genital tract infection
7. Immunological cause- Presence of Antinuclear antibodies, Lupus anticoagulant & Anticardiolipin antibodies.
8. Unexplained.

Second trimester abortion :

1. Congenital anatomic abnormalities of uterus e.g. unicornuate, bicornate, separate or double uterus.
2. Acquired anatomic abnormalities of uterus e.g. uterine fibroids, intrauterine adhesions, endometriosis, cervical incompetence, cone biopsy or cervical amputation and forceful surgical dilatation.
3. Chronic maternal illness
4. Syphilis, toxoplasmosis
5. Unexplained.

Clinical features

- History of mid trimester loss which is almost painless following spontaneous rupture of membranes in cervical incompetence. It may be primary or secondary to live birth; in latter case, cervical incompetence caused by cervical tear is a strong possibility and should be excluded. If the abortions have taken place at same period of gestation and in similar fashion, then the underling recurrent cause is the only possibility.

On examination

- Findings like cervical tear going up to internal os, shortening of cervical length with patulous os and membranes bulging through os suggest incompetent os. By USG dilated os, funneling of membranes into os will help in diagnosing incompetent os.

Investigations

- To rule out possible cause of recurrent abortion investigations should be done in preconceptional period.
- ABORh (Husband and Wife), EBS, PPBS, VDRL, Thyroid function test, TORCH profile, Serum LH.
- Autoimmune screening of lupus anticoagulant & anticardiolipin antibodies.
- USG

- HSG to detect uterine malformations, cervical incompetence etc.
- Karyotyping of husband & wife.
- Endocervical swab-culture & sensitivity.

Management

- Treatment will vary according to cause and proper treatment should be given before starting next pregnancy. In cases where no cause is detected, general advice regarding balanced diet, abstinence during critical period and assurance is given to patient. She may be hospitalised during time of previous abortions.
- To control diabetes & thyroid dysfunction.
- In hypersecretion of LH GnRH analogue therapy should be given.
- In progesterone deficiency (LPD) 17 alpha hydroxy progesterone injection 250 mg twice weekly or chorionic gonadotrophin 10000 I.U. biweekly can be given from 8th week onwards after confirming foetal heart activity ultrasonographically.
- Antiphospholipid antibody syndrome (APS)- Low dose aspirin (75 mg/day) or Heparin (5000 IU SC 12 hourly) and low dose aspirin.
- Inherited thrombophilias-Heparin (5000 IU SC twice daily).
- Cervical incompetence- During pregnancy repeated pelvic examination may be required at weekly interval from 10 weeks onwards in suspected cases of incompetence. Shirodkar & McDonald operation are performed. In a proven case, the operation should be done around 14th weeks of pregnancy or at least two weeks earlier than the lowest period of previous wastage, as early as 10th week.

Mc Donald operation : It is treated under general anaesthesia by insertion of purse string suture of non-absorbable material in the thickness of wall of the cervix at the level of internal os after pushing the bladder up or putting the stitch below internal os.

- Preoperatively patient should have proluton depot 500 mg I.M. which is then continued postoperatively biweekly for one week.
- Patient should be kept sedated for 24 hours afterwards.
- Stitch is removed at 38 weeks or at onset of labour. Failure to remove stitch will cause obstructed labour or annular detachment of cervix posteriorly and bleeding.
- Patient should be told about this risk.
- Complications like slipping or cutting through the suture requires biweekly examination. Intrauterine infection, rupture of membranes and abortion can take place.
- Contraindications to stitch application are leaking, features of amnionitis, bleeding and uterine irritability.

Septic Abortion

In any abortion uterine contents can become infected and then this is known as septic abortion. Infection mostly follows illegal induced or criminal abortion although it can follow spontaneous abortion. About 10% of abortions requiring admission are septic and this is an important cause of maternal morbidity and mortality. 20-30% of maternal mortality is due to septic abortions.

Cause

Products of conception and blood are good culture media for organisms. Microorganisms which are normally present in vagina can infect these (endogenous infection) or infection can be introduced in the uterus by use of infected instruments, non-observation of asepsis, injury to gut or by leaving the evacuation process incomplete. Microorganisms can be either anaerobes like bacteroides, streptococci, clostridium welchi and tetanus bacilli; or aerobes like E. coli, Klebsilla, staphylococcus, pseudomonas, proteus and haemolytic streptococci.

Grading

Grade I - In majority of cases, infection is confined to contents of uterus.

Grade II - In 15% cases spreads to myometrium, parametrium, tubes, ovaries and pelvic peritoneum, infection is contained within the pelvis.

Grade III - In about 5% cases there is generalised peritonitis (when infection spreads to peritoneum either through fallopian tubes or directly due to uterine perforation and gut perforation) or endotoxic shock.

Clinical Symptoms

- Depend on severity and site (uterine or gut perforation of infection).
- Usually temperature with chills and rigors.
- Patient complaints of pain abdomen and offensive or purulent discharge or vaginal bleeding.

On examination

- Patient may be febrile,
- Features of septicaemia (tachycardia and increased respiratory rate)
- Patient may be anaemic due to haemorrhage and sepsis.
- Tenderness in lower abdomen (in pelvic peritonitis) or whole abdomen may be tender with guarding, rigidity and/or distension (features of generalised peritonitis)
- Mass in lower abdomen may be felt.
- Bowel sounds may be absent which indicate gut perforation.

Pelvic examination

- a) Tender uterus, offensive or purulent discharge through cervix, os may be closed or open.
- b) Products of conception can be felt when os is open and sometimes foreign bodies used for abortion can also be felt.
- c) There may be cellulitis, firm and tender thickening in parametrium, tender adenexal masses in the fornices (Infected tubo-ovarian masses); or fullness or cystic fluctuating mass in the posterior or lateral fornix (pelvic abscess).
- d) Parametrial involvement or pelvic cellulitis and abscess is best felt through Per Vaginum and Rectal (PVR) examination; keeping index finger of right hand in vagina and middle finger in rectum and left hand on abdomen.
- e) In case of pelvic abscess, patient complains of high temperature, purulent discharge per vaginum, tenesmus and mucus diarrhoea. There is tenderness and guarding in lower abdomen and PVR examination reveals cystic fullness in pouch of Douglas.

Investigations

- Hb, TLC, DLC, ABO, Rh typing, blood urea, serum electrolytes, liver function tests and coagulation profile.
- In cases of respiratory difficulty, blood for acid, base and gas analysis should be sent.
- Urine should be examined microscopically and for albumin and sugar.
- Blood, cervical swab and urine are sent for culture and sensitivity.
- X-ray of chest and abdomen in sitting and lying position (to demonstrate gas under diaphragm following uterine or gut perforation) is taken. Absence of gas under diaphragm does not rule out perforations.
- USG can be done to demonstrate any free fluid in abdomen (blood or pus) or any products in uterus or collection of fluid (pus or blood) in Pouch of Douglas.

General Management

1. Hospitalization
2. Broad spectrum antibiotics like ampicillin 500 mg I.M. six hourly plus gentamycin 80 mg I.V. twice daily and metronedazole 500 mg I.V. 8 hourly is given to patient.
3. Pulse rate, B.P., central venous pressure (normal is 0-5 cm of water) and intake output chart is maintained.
4. Urine output of 30 ml/hour shows adequate blood circulation and tissue perfusion.
5. Prophylactic anti-gasgangrene serum (8000 units) and anti-tetanus serum (3000 units) are given to illegal abortion cases.

6. Analgesics and sedatives can be given.
7. If patient is toxic or looks very ill then higher antibiotics like 3rd generation cephalosporins can be started, intravenous drip is given.
8. Blood transfusion is given to severely anaemic patients.
9. Evacuation of uterus is done after starting antibiotics in grade I. One should be very gentle and sharp curettage should be avoided to prevent perforation and spread of infection.

Patient should be watched for complications like

- Haemorrhage.
- Spread of infection outside uterus (pelvic peritonitis, generalised peritonitis, septicaemia)
- Renal failure (due to toxic cortical necrosis or tubular nephrosis)
- Thrombophlebitis and embolisation
- Coagulation failure
- Renal shut down due to release of thromboplastins from damaged placenta and coagulation failure is due to consumptive coagulopathy.

Complications in Early Pregnancy

20% of maternal mortality may be due to these above complications, Jaundice and hepatic failure due to use of hepatotoxic drugs for inducing abortion or due to Clostridium welchii infection.

Late complications of septic abortion

- Secondary infertility due to tubal block
- Chronic ill health and pelvic pain
- Chronic pelvic inflammatory disease
- Endometritis.

Management of grade II and grade III septic abortion

1. If infection has gone beyond uterus, then evacuation should be done 48 hours after control of infection.
2. In case of haemorrhage, immediate evacuation is to be done.
3. In pelvic abscess, needling through posterior fornix to diagnose abscess followed by Colpotomy (incision in posterior fornix to drain pus) is done. Mellicott catheter is left through colpotomy incision for 24 hours to facilitate drainage.
4. All grade II and III cases should be kept on intravenous fluids and higher antibiotics.

5. Laparotomy is indicated when there are features of generalised peritonitis to drain pus. If no improvement on medical treatment or there is deteriorating condition, then gangrenous and infected uterus is removed or perforation site is stitched and intestinal injury repaired; and foreign bodies removed. Inferior vena cava is ligated in case of repeated embolisation.

Legalised Induced Abortion

India was one of the first countries which legalized induced abortion through the Medical Termination of Pregnancy Act of 1971. According to this act, a woman can legally have an abortion if its pregnancy carries the risk of grave physical injury or endangers her mental health, if it is a result of contraceptive failure in a married woman, if it is the consequence of rape, or if it is likely to result in the birth of a child with physical or mental abnormalities. In such circumstances, abortion is permitted up to 20 weeks of pregnancies without any need for spouse consent.

Medical Termination of Pregnancy (MTP)

An attempt to provide safeguard against indiscriminate abortion was made in the Medical Termination of Pregnancy Act in India in 1971, and has been enforced in April 1972. The provision of act has been revised in 1975.

The Conditions under which a pregnancy can be terminated under the MTP Act 1971 are as follows :

1. **Medical:** Where continuation of the pregnancy might endanger the mother's life or cause grave injury to her physical or mental health.
2. **Eugenic:** Where there is substantial risk of the child being born with serious handicapped due to physical or mental abnormalities.
3. **Humanitarian:** Where pregnancy is the result of rape, both in major and minor girl and in mentally imbalanced women.
4. **Socio-economic:** Where actual or reasonably foreseeable environments (whether social or economic) could lead to risk injury to the health of the mother.
5. **Failure of contraceptive devices:** The agony caused by an unwanted pregnancy resulting from a failure of any contraceptive device or method can be presumed to constitute a grave injury to the mental health of the mother. This condition is a unique feature of the Indian Law and virtually allows abortion on request.

Recommendations

1. **The person or persons who can perform abortion :** The Act provides safeguards to the mother by authorizing only a registered medical practitioner having experience in gynaecology and obstetrics, and has assisted in at least 25 MTP.

2. **Where abortion can be done :** The Act stipulates that no termination of pregnancy shall be made at any place other than a hospital established or maintained by the government or a place approved for the purpose of this act by government. Under the new rules, non-governmental institutions may also take up abortions provided they obtain a license from the Chief Medical Officer of the District, thus eliminating the requirement of private clinics obtaining a Board License.
3. The abortion has to be performed confidentially and to be reported to the Director of Health Services of the state in the prescription form.
4. Termination is permitted up to 20 weeks of pregnancy. When pregnancy exceeds 12 weeks, opinion of two medical practitioners is required.
5. Pregnancy can only be terminated on the written consent of the women.
6. The written consent of the guardian is necessary before performing abortion in women under 18 years of age, and in lunatics even if they are older than 18 years.

Issues Associated with Legal Abortions

Physical and Medical Issue

A woman is made physically and psychologically for motherhood. This is the basic fact of her life. If this process of becoming a mother is suddenly stopped, the shock will have its effect. This effect may be physical or mental, immediate or long term.

Emotional Issue

There is emotional and physical unrest experienced during the first few weeks of pregnancy. It is at this time that the expectant mother may be subjected to maximum pressure to agree to an abortion. The common psychological problems associated with abortion are depression, neurosis, guilt etc.

Each individual is different. For some, abortion provides great relief with little or no disturbance. For the others, the experience can be upsetting. The key factor seems to be whether the woman wants an abortion or whether she is hesitant. Being refused an abortion and forced to bear an unwanted child can lead to psychiatric symptoms. But the woman who has health problems and has to have an abortion or who is persuaded to have an abortion against her better judgement is also more likely to show negative psychological reactions following an abortion.

Social Issues

Legalised abortion saves lives by reducing the number of illegal attempts. Anti-abortionists emphasize their fears that without any restriction, except the individual women and her conscience, an 'Abortion Mentality' develops so that abortion becomes too common and are performed too easily or for reasons that are not serious: For

example teenage pregnancy tend to become a common occurrence among several college students in urban areas with free access to abortion facilities.

Moral Issues

Much of the controversy about abortion has centred on the moral issues. In ordinary justice, the child has as much claim as the mother to life and should have even more claim to legal protection of its right, since it is incapable of defending itself.

The Anti abortionists claim that science has proven beyond any reasonable doubt that human life begins at fertilization. The foetus from the beginning has its own life, is a totally new human being, a new person, with a genetic code quite distinct from the genetic code of its parents. That new life is completely there at fertilization, lacking only development and growth. Abortion always takes away the innocent's already existing life.

Methods of Abortion

First trimester	Second trimester
<p>1. Surgical</p> <ul style="list-style-type: none"> • Manual Vacuum Aspiration • Suction Curettage • Dilation and Evacuation (D&E) <p>2. Medical</p> <ul style="list-style-type: none"> • Mifepristone(RU-486) • Mifepristone & Misoprostol • Methotrexate & Misoprostol • Tamoxifen & Misoprostol 	<p>1. Surgical</p> <ul style="list-style-type: none"> • Dilation and Evacuation (D&E) • Dilation and Extraction (D&X) • Hysterotomy –rarely done <p>2. Medical</p> <ul style="list-style-type: none"> • Intrauterine installation of hyperosmotic solutions • Prostaglandins • Oxytocin infusion

1. Manual Vacuum Aspiration : This surgical abortion is done early in the pregnancy upto 7 weeks after the woman's last menstrual period. A long thin tube (6 mm) is inserted into the uterus through cervix. A syringe of 50 ml is attached to the tube and the embryo is suctioned out.

This is contraindicated after 7 weeks of pregnancy and in presence of PID.

2. Suction Curettage : This is the most common method of surgical abortion. Because the foetus is larger, first stretch opens the cervix using metal dilators. Opening the cervix may be painful, so local or general anesthesia is needed. After the cervix is dilated, insert a hard plastic tube or cannula into the uterus, then connects this tube to a suction machine. The suction pulls the foetal body apart out of the uterus. The pressure of suction is raised up to 400-600 mm Hg. We may also use a curette to scrape the foetal

parts out of the uterus at the end of suction then reintroduce the cannula to suck out any remnants.

3. Dilation and Evacuation (D&E) : This surgical abortion is done during the second trimester of pregnancy. At this point in pregnancy, the foetus is too large to be broken up by suction alone and will not pass through the suction tube. In this procedure, the cervix must be opened wider than in a first trimester abortion. This is done by inserting numerous thin dilators a day or two before the abortion. Once the cervix is stretched open the foetal parts pull out with forceps. The foetus' skull is crushed to ease removal. A curette is also used to scrape out the contents of the uterus, removing all remaining tissues.

4. Dilation and Extraction (D&X) : These procedures typically take place over three days, use local anesthesia, and are associated with increased risk to life and health of the mother. On the first day, under ultrasound guidance, the foetal heart is injected with a medication eg. Digoxin or Potassium chloride that stops the heart and cause the foetus to die. Also over the first two days, the cervix is gradually stretched open using laminaria or Misoprostol. On the third day, the amniotic sac is burst and drained. The remaining procedure is similar to the D&E procedure.

5. Mifepristone (RU486) and Misoprostol (Abortion Pill) : This drug is only approved for use in women up to the 49th day after their last menstrual period. The procedure usually requires three time visits. On the first visit, the woman is given pills to cause the death of the embryo. Two days later, if the abortion has not occurred, she is given a second drug which causes cramps to expel the embryo. The last visit is to determine if the procedure has been completed.

There are two regimens :

1. On 1st day 600 mg mifepristone orally then on 3rd day 400 μ g misoprostol orally.
2. On 1st day 200 mg mifepristone orally then on 3rd day 800 μ g misoprostol vaginally.

If fail surgical methods for termination should be used. RU486 will not work in the case of an ectopic pregnancy. This is a potentially life-threatening condition in which the embryo lodges outside the uterus, usually in the fallopian tube.

6. Methotrexate and Misoprostol : This method should used before 56 days of gestational period and takes longer time to abort. 50 mg/M² Methotrexate IM followed by 7 days latter 800 μ g misoprostol vaginally.

7. Tamoxifen and Misoprostol : This method should used before 63 days of gestational period. 20 mg Tamoxifen for 4 days orally followed by 800 μ g misoprostol vaginally.

8. Intrauterine installation of hyperosmotic solutions

(i) Intra-amniotic installation of hypertonic saline (20%) or Salt Poisoning : It is the most often used method after the first trimester. 20% salt solution is injected directly into the amniotic sac. The amount of saline (in ml) is calculated as number of weeks of gestation multiplied by 10. The foetus breathes and swallows it. It is poisoned, struggles, and sometimes convulses. It takes over an hour to kill the foetus. The mother delivers the dead baby in a day or two sometimes alive. The corrosive effect of the salt solution often burns and strips away the outer layer of the baby's skin. This exposes the raw, red, glazed- looking subcutaneous layer of tissue.

(ii) Intra-amniotic installation of hyperosmotic urea solution : Intra-amniotic installation of 40% urea solution (80 gm of urea in 200ml distilled water) along with oxytocin drip is effective with less complications.

(iii) Extra-amniotic installation of 0.1% ethacrydine lactate : It is installed transcervical through a Foley's catheter no. 16. The amount (in ml) is calculated as number of weeks of gestation multiplied by 10.

9. Prostaglandins : Prostaglandins and their analogues are very much effective. They are used extensively, specially in the second trimester. They act on the cervix and the uterus.

Route of administration— It can be given through vaginal, intramuscular, intra-amniotic or extra-amniotic routes but intravenous route is not recommended because of its high toxicity.

Vaginal : (i) PGE₁ analogue (Misoprostol) 200 µg every 12 hours

(ii) PGE₂ (Dinoprostone) suppository 20 mg every 3 hours.

Intramuscular :

(i) 15 methyl PGF_{2α} (Carboprost tromethamine) 250 µg 3 hourly for a maximum of 10 injections.

(ii) Sulprostone (PGE₂ analogue) 500 µg administered intramuscularly at every 3 hours.

Intra-amniotic : 15 methyl PGE_{2α} (carboprost tromethamine) 2 mg is instilled.

Extra-amniotic : Introduced through a foley's catheter No.14 passed transcervically and inflated with 10 ml saline. PGF_{2α} 200-500 µg or PGE₂ 200µg preparations used. The solution is introduced 2 hourly for a maximum of 10 such.

10. Oxytocin : Oxytocin drip is administered along with any of the methods used either intra-amniotic or extra-amniotic medications to augment the process of abortion. Usually higher dose (up to 300 units in 500 ml of DNS) is used.

11. Hysterotomy : Hysterotomy is extraction of the product of conception out of the uterus before 28 weeks by cutting through the anterior wall of the uterus. This method is used in second trimester abortion on failure of medical induction and likened to an "early" Caesarian section.

Complications of Abortion

Side effects may occur with induced abortion, whether surgical or by medication. These include abdominal pain and cramping, nausea, vomiting, and diarrhoea. Abortion also carries the risk of significant complications as follows :

1. **Heavy Bleeding** - Bleeding occurs after abortion but if the cervix is torn or the uterus is punctured, there is a risk of severe bleeding where blood transfusion may be required. Severe bleeding is also a risk with the use of RU486.
2. **Infection & PID** - Infection can develop from the insertion of instruments into the uterus, or from foetal parts that are mistakenly left inside. A pelvic infection may lead to persistent fever over several days and extended hospitalization. It can also cause scarring of the pelvic organs.
3. **Incomplete Abortion** - Some foetal parts may be mistakenly left inside after the abortion. Bleeding and infection may result.
4. Complications from general anaesthesia used during abortion may result in convulsions, heart attack, and in extreme cases, death.
5. **Damage to the Cervix** - The cervix may be cut, torn, or damaged by the use of instruments. This can cause excessive bleeding that requires surgical repair.
6. **Asherman syndrome** - By the use uterine curettes may cause permanent scarring or adhesions of the uterine lining called Asherman syndrome. This results in secondary amenorrhoea.
7. **Cervical incompetence** - Repeated mid trimester abortions may lead to cervical incompetence.
8. **Perforation of the Uterus** - The uterus may be punctured or torn by abortion instruments. The risk of this complication increases with the length of the pregnancy. If this occurs, major surgery may be required, including removal of the uterus (hysterectomy).
9. **Damage to Internal Organs** - When the uterus is punctured or torn, there is also a risk that damage will occur to nearby organs such as the bowel and bladder.
10. **Placenta Praevia** - Condition during pregnancy where the placenta covers the cervix, making a caesarean section necessary. This can put the woman to a greater risk which may lead to loss of blood and subsequent blood transfusion. Placenta praevia also

causes high risk of hysterectomy involving a major surgery. Induced abortion increase the risk of placenta praevia to a great extent.

11. Pre-term Birth - Pre-term birth as well as low birth weight of subsequently delivered children have been recorded as negative results of the abortion of the first foetus.

12. Death - In extreme cases, other physical complications from abortion including excessive bleeding, infection, organ damage from a perforated uterus, and adverse reactions to anaesthesia may lead to death.

13. Emotional and Psychological Impact - There is evidence that abortion is associated with a decrease in both emotional and physical health. For some women these negative emotions may be very strong, and can appear within days or after many years. This psychological response is a form of post-traumatic stress disorder. Some of the symptoms are:

- Eating disorders
- Relationship problems and Sexual dysfunction
- Guilt
- Depression
- Flashbacks of abortion
- Suicidal thoughts and suicidal attempts
- Alcohol and drug abuse.

14. Consequences of Illegal Abortion - Illegal abortions frequently led to the complications such as perforations of the uterus, hemorrhage and infection requiring gynaecological care and hospitalization. A woman who has undergone an abortion is also more likely to have subsequent children both physically and mentally handicapped. Damage to the wall of the uterus can affect the normal development of the placenta through which the baby takes its nourishment. The commonest and gravest ill effect is sterility and inability to carry subsequent pregnancies up to the term. The rates of maternal mortality linked to illegal abortions are known to be higher.

Pre-Conception and Pre-Natal Diagnostic Techniques (PCPNDT)

Misuse of technology is a major reason for distorting child sex ratios. The child sex ratio describe as the ratio of girls to boys in the age group of 0-6 years. In order to regulate use and prohibit misuse of technology, the Pre-Conception and Prenatal Diagnostic Techniques (PC & PNDT) act enacted in 1994 and amended in 2003 is an important tool for addressing sex selective eliminations. The main purpose of the act is to prohibit and regulate the use of diagnostics techniques before and or after conception for sex determinations leading to sex selective elimination of foetus. The provision of the

act encompasses creating institutional mechanisms and providing tools to monitor the use of diagnostic techniques for prohibiting sex selection. There is provision of punishment and penalty for those who violate provisions of PC & PNDT Act.

Pre-Conception and Pre-Natal Diagnostic Techniques (PCPNDT) Act, 1994 is an Act of the Parliament of India enacted to stop female foeticides and arrest the declining sex ratio in India. The act banned prenatal sex determination.

Objectives : The main purpose of enacting the act is to ban the use of sex selection techniques before or after conception and prevent the misuse of prenatal diagnostic technique for sex selective abortion.

Salient features : Offences under this act include conducting or helping in the conduct of prenatal diagnostic technique in the unregistered units, sex selection on a man or woman, conducting PNDT test for any purpose other than the one mentioned in the act, sale, distribution, supply, renting etc. of any ultra sound machine or any other equipment capable of detecting sex of the foetus.

Main provisions in the act are:-

1. The Act provides for the prohibition of sex selection, before or after conception.
2. It regulates the use of pre-natal diagnostic techniques, like ultrasound machine by allowing them their use only to detect:-
 - Genetic abnormalities,
 - Metabolic disorders,
 - Chromosomal abnormalities,
 - Certain congenital malformations,
 - Haemoglobinopathies,
 - Sex linked disorders.
3. No laboratory or centre or clinic will conduct any test including ultrasonography for the purpose of determining the sex of the foetus.
4. No person, including the one who is conducting the procedure as per the law, will communicate the sex of the foetus to the pregnant woman or her relatives by words, signs or any other method.
5. Any person who puts an advertisement for pre-natal and pre-conception sex determination facilities in the form of a notice, circular, label, wrapper or any document, or advertises through interior or other media in electronic or print form or engages in any visible representation made by means of hoarding, wall painting, signal, light, sound, can be imprisoned for up to three years and fined Rs. 10,000.

Rh-Incompatibility

Rhesus incompatibility is the commonst cause of haemolytic disease. ABO incompatibility can also cause haemolytic disease but it is rare.

Classification of Rhesus factor

In every individual, Rhesus genes are carried on two chromosomes one of which is passed on to the succeeding generation. There are six main Rhesus genes, three carried in each chromosome. Of the six, 3 are dominant genes and 3 are recessive genes. The 3 dominant genes are C, D and E and the recessive genes are c, d and e. Each chromosome has a locus for C, D and E which may be occupied by either dominant or recessive gene of the particular type.

In Rh-incompatibility, the dominant D gene is the most important. The individual possessing D gene is one or both chromosome is known as Rh⁺ve. When dominant D gene is absent in both chromosomes and its place is occupied by its allele d genes, the person is known as Rh-negative. Genotype means the mixture of these three pairs of genes on the two chromosomes. Many combinations are possible to illustrate the point, the following example is given:

- CDe/cDE Homozygous Rhesus positive
- CDE/cde Heterozygous Rhesus positive
- CdE/cde..... Rhesus negative

When a Rh negative women marry a Rh positive man, the offspring will be Rh positive if the man is homozygous positive and can either be Rh-negative or Rh positive if he is heterozygous. If the man is also Rh negative, the offspring will be Rh negative and there will be no incompatibility.

Inheritance pattern of Rh- group to the Children

Father	Mother	Children
Rh ⁺ /Rh ⁺	Rh ⁺ /Rh ⁺	100% Rh ⁺
Rh ⁺ /Rh ⁺	Rh ⁺ /Rh ⁻	50% Rh ⁺ /Rh ⁺ 50% Rh ⁺ /Rh ⁻
Rh ⁺ /Rh ⁻	Rh ⁺ /Rh ⁻	50% Rh ⁺ /Rh ⁻ 25% Rh ⁺ /Rh ⁺ 25% Rh ⁻ /Rh ⁻
Rh ⁺ /Rh ⁻	Rh ⁻ /Rh ⁻	50% Rh ⁺ /Rh ⁻ 50% Rh ⁻ /Rh ⁻
Rh ⁺ /Rh ⁺ Rh ⁻ /Rh ⁻	Rh ⁻ /Rh ⁻ Rh ⁻ /Rh ⁻	100% Rh ⁺ /Rh ⁻ 100% Rh ⁻ /Rh ⁻

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Genetic combination of Rh Factor

Father	Mother	Child	Condition
Rh ⁺	Rh ⁺	Rh ⁺	Normal
Rh ⁻	Rh ⁺	Rh ⁺	Normal
Rh ⁻	Rh ⁻	Rh ⁻	Normal
Rh ⁺	Rh ⁻	Rh ⁺	4% risk of abnormality in first child

In India, prevalence of Rh D antigen varies from 90 to 95%, lower in South India compared to North India. CDE antigen other than D have low immunogenicity and not very important except on few occasions. Therefore, all the pregnant women should be routinely screened for D (Rh) antigen on erythrocytes.

The problem of isoimmunisation occurs because an Rh negative individual (mother) can produce antibodies when exposed to antigen from foetus (paternally inherited antigen). One must know that 0.25 ml of foetal blood is enough to cause Rh isoimmunisation. The interval between the maternal exposure to antigen and its antibody response is usually many weeks. Hence, in primigravida, foetus may not be affected. In subsequent pregnancies, antibodies produced by the mother in turn cross the placenta, enter the foetal circulation resulting in foetal haemolysis and its consequences.

The mother is exposed to antigen if the foetus is Rh +ve at the time of separation of the placenta after the birth of the baby. Some amount of foetal blood enters into maternal circulation. The mother will produce antibodies to Rh antigen which in subsequent pregnancies enter the foetal circulation and lead to haemolysis of foetus (if it is Rh positive). It is also possible that the foetal red cells can enter into maternal circulation during pregnancy if there is separation of placenta (e.g. Abruption placenta). There are other situations when there is likelihood of Rh isoimmunisation due to transfusion with Rh positive blood, e.g. abortion, MTP, amniocentesis and external version.

Erythroblastosis Foetalis or Hemolytic disease of newborn

There are two main causes of erythroblastosis foetalis : Rh incompatibility and ABO incompatibility.

Rh-incompatibility as described earlier when Rh-negative woman is impregnated by a Rh positive man and the baby born is Rh positive then the woman body will create antibodies against the Rh-factor. These antibodies will attack the blood cells if the woman become pregnant with another Rh-positive baby.

ABO incompatibility occurs when the woman's blood type of A, B or O is not compatible with the baby's.

Symptoms of erythroblastosis foetalis include swollen, pale or jaundiced baby, hepatosplenomegaly, anaemia and hydrops foetalis.

Hydrops foetalis

Haemolysis in foetus leading to hydrops foetalis or hyperbilirubinemia in neonatal period. The affected foetus show sever anaemia due to haemolysis leading to hydrops foetalis. Marked tissue oedema will be seen in the affected foetus as well as effusion in the serous cavities, the placenta markedly enlarged boggy, with prominent cotyledons. Excessive extra medullary hematopoiesis results, in massive hepatosplenomegaly. Histological examination of liver show fatty degenerative parenchymal changes.

Haemosiderin and engorgement of hepatic canaliculi with bile. There may be cardiomegaly and pulmonary haemorrhage. The ascitis along with hepatosplenomegaly may result in severe dystocia. The foetus with hydrops may die in utero from profound anaemia and circulatory failure. The live born of hydropic infant appears pale, oedematous and limp at birth; often requiring resuscitation. Dyspnoea and circulatory failure are common.

Hyperbilirubinemia

The less severely affected infants appear well at birth and become jaundiced within few hours. The foetus does not develop jaundice in utero because unconjugated bilirubin resulting from foetal haemolysis freely crosses placenta and allters maternal circulation where it is disposed by maternal liver. But at birth, newborn especially premature, liver is not mature enough to metabolise high levels of un-conjugated bilirubin resulting in hyperbilirubinaemia. The unconjugated bilirubin crosses the blood brain barrier and enters central nervous system resulting in degeneration of the basal ganglia and hyplocampus. This complication occurs more often in premature, hypoxic, acidotic infants. Surviving infants show spasticity, muscular in coordination and varying degree of mental retardation. There is a positive correlation between serum unconjugated bilirubin and kernicterus above 18-20 mg/dl, although kernicterus can develop at lower concentrations.

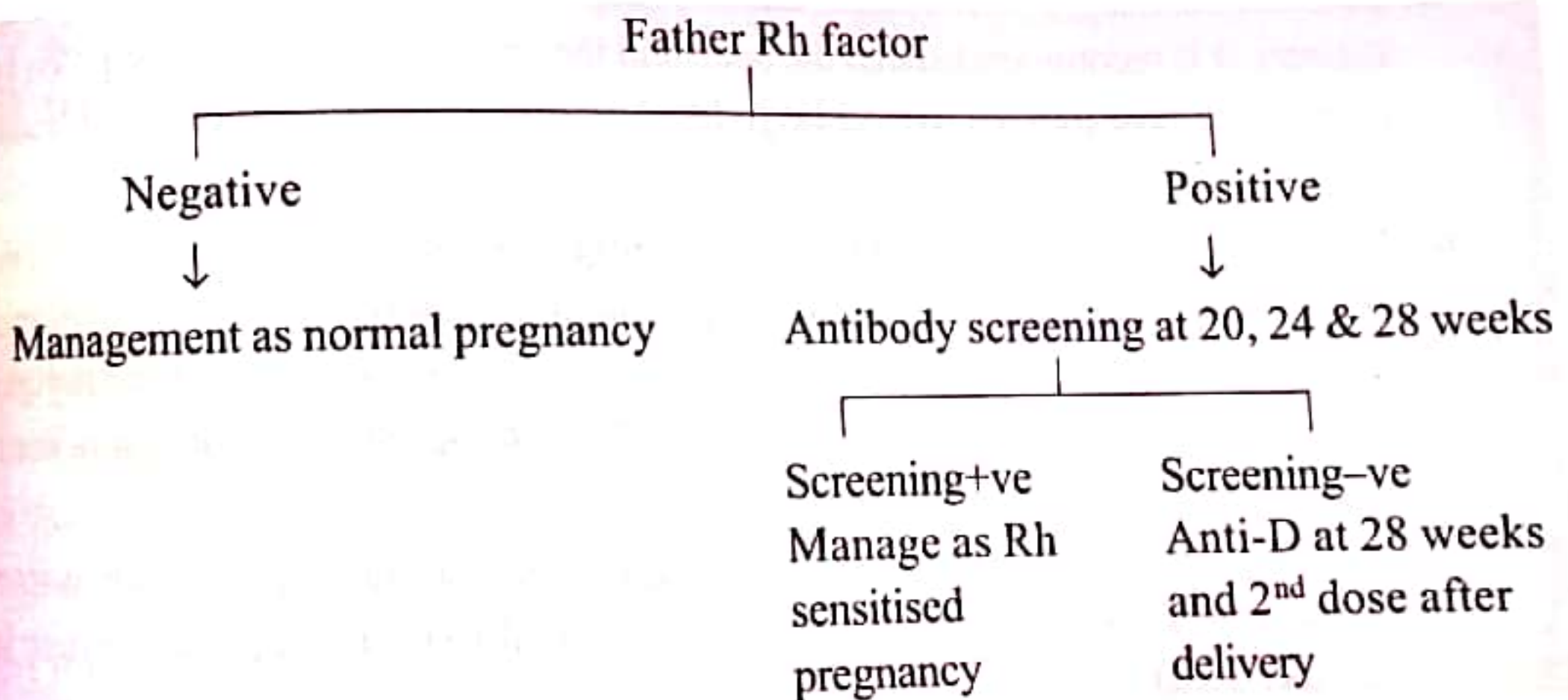
Management of Rh-ve non-immunised pregnant woman

Routine screening of all pregnant women should be done for the blood group and Rh typing at 1st prenatal visit. It is important to note that the chances of Rh isoimmunisation depends on Rh blood type of the father. If the father is Rh negative, there are no chances of Rh isoimmunisation. If the father is Rh positive, the baby has the chance of 50% being Rh positive (Heterozygos) and 100% being Rh positive (Homozygos). Hence if the woman is Rh -ve, husband's blood grouping is done. If he is Rh +ve, wherever possible, his Rh genotyping is done to know if he is homozygous or heterozygous Rh +ve.

Once the pregnant woman is identified as Rh negative, with an Rh+ve husband, the next logical step is to screen for anti-Rh antibodies to rule out sensitization which is done by indirect Coomb's test.

Indirect Coomb's test

1. Indirect Coomb's test detects maternal antibodies (i.e., IgG; incomplete antibodies) by Coomb's serum, which contains anti IgG immunoglobulin.
2. The IgG antibodies (Anti Rh antibodies) cannot agglutinate red blood cells themselves at 37 degree centigrade but they do so in presence of albumin or Coomb's serum.
3. Indirect Coomb's test is done at 1st prenatal visit and if negative repeated at 20, 24 and 28 weeks of gestation.
4. If any time the indirect Coomb's test is positive it is managed as Rh isoimmunized pregnancy.
5. If indirect Coomb's test is negative by 28 weeks, anti-D prophylaxis given and indirect Coomb's test is discontinued.



In cases where excessive fetomaternal haemorrhage is suspected (e.g. abruptio placenta, caesarean section, manual removal of placenta), Kleihauer-Betke's test is used to quantify the amount of foetal erythrocytes in maternal circulation and amount of anti-D required is calculated. Pregnancy in non-immunised women is allowed to go to term - for spontaneous labour. They have to be induced if they go beyond 40 weeks. After delivery, cord is clamped immediately after birth to prevent the fetomaternal transmission. Cord blood is collected and sent for blood group (ABO, Rh), coomb's test, Hb and serum bilirubin. Anti-D (300 ug) is given I.M. as early as possible within 72 hours if baby's blood group is Rh +ve more about anti-D therapy is given.

Anti-D

The effective maternal prophylaxis against Rh isoimmunisation with anti-D was developed by Finn and associates and Freda and co-workers in 1963.

1. Anti-D immunoglobulin (IgG) when given to mother, coats the foetal erythrocyte in maternal circulation leading to enhanced destruction of foetal erythrocytes in maternal reticulo endothelial system and prevents exposure of anti-D antigen sites to maternal immune system.
2. Each dose of anti-D contains 300 microgram of anti-D which neutralises about 15 ml of foetal erythrocytes (30 ml of cord blood).
3. Anti-D (300 microgram) is given routinely to all Rh negative, non-sensitised women within 72 hours of delivery and it prevents Rh isoimmunisation in 98% of the cases.
4. Routine antenatal administration of anti-D given at 28 weeks along with the second dose at immediate post-partum period (within 72 hours) brings down the Rh sensitisation to less than 0.07%.
5. Late antenatal administration of Anti-D at 28 weeks is not routinely practiced in our country. It is recommended that the need and the amount of Anti-D to be given in the immediate post partum period be judged by quantifying fetomaternal haemorrhage.
6. About 2% of Rh negative women undergoing spontaneous abortion, 5% of those undergoing medical termination of pregnancy and 6% of those undergoing amniocentesis have a chance of Rh isoimmunisation. Hence, anti-D prophylaxis is routinely given to all Rh negative women undergoing spontaneous abortion, medical termination of pregnancy and amniocentesis.
7. Anti-D prophylaxis may not be protective against Rh isoimmunisation when amount of foetal erythrocytes in maternal circulation exceed 15 (Feto maternal haemorrhage exceeds 30 ml).

Kleihauer-Betke test (Acid elution test)

1. It is necessary to quantify the exact amount of foetal erythrocytes in maternal circulation in case of excessive fetomaternal haemorrhage (Abruptio placenta, manual removal of placenta, Caesarean section etc.).
2. The principle behind Kleihauer-Betke test is that when treated with acid the maternal haemoglobin will be driven out of maternal erythrocytes, giving them 'ghost' cell appearance, which does not happen with foetal erythrocytes.
3. Foetal erythrocytes identified by Kleihauer-Betke test can be quantified and dose of anti-D can be calculated.

Gestational Trophoblastic Neoplasia (GTN)

Definition

Gestational trophoblastic neoplasia (GTN) encompasses a spectrum of proliferative abnormalities of trophoblasts associated with pregnancy.

Classification

1. **Histological** - Hydatidiform mole (complete and partial), invasive mole, chorio carcinoma and placental site trophoblastic tumour.
3. **Non-Metastatic disease** - Limited to the uterus
2. **Metastatic disease** -
 - A. **Low risk (good prognosis):**
 - Disease is present < 4 months duration
 - Initial serum hCG level < 40,000 mIU/ml
 - Metastasis limited to lung and vagina
 - No prior chemotherapy
 - No preceding term deliver
 - B. **High risk group (poor prognosis):**
 - Long duration of disease (> 4 months)
 - Initial serum hCG > 40,000 mIU/ml
 - Brain or liver metastasis
 - Failure of prior chemotherapy
 - Following term pregnancy

Risk factors

- a) The woman being under 20 years of age, or over 35 years of age
- b) Previous GTN

Hydatidiform moles

Hydatidiform moles are abnormal conceptions with excessive placental development. Conception takes place, but placental tissue grows very fast, rather than supporting the growth of a foetus.

Complete hydatidiform moles have no foetal tissue and no maternal DNA, as a result of a maternal ovum with no functional DNA. Most commonly, a single spermatozoon duplicates and fertilises an empty ovum. Less commonly, two separate spermatozoa fertilise an empty ovum (dispermic fertilisation).

Partial hydatidiform moles have a foetus or foetal cells. They are triploid in origin,

containing one set of maternal haploid genes and two sets of paternal haploid genes. They almost always occur following dispermic fertilisation of a normal ovum.



Complete hydatidiform



Partial hydatidiform

Malignant forms of GTN are very rare. About 50% of malignant forms of GTN develop from a hydatidiform mole.

Symptoms

- Persistent abnormal vaginal bleeding
- Enlarged uterus
- Pelvic pain or discomfort
- Hyperemesis
- Expulsion of grapes like vesicles per vaginum in complete mole.

Investigations

- Routine tests during pregnancy, such as blood tests and ultrasound.
- Through tests done after miscarriage or abortion.
- Elevated serum hCG (human chorionic gonadotropin hormone). In GTN, the beta subunit of hCG (beta hCG) is also always elevated. Therefore, if GTN is clinically suspected, serum beta hCG is also measured.
- If malignant GTN is suspected clinically, biopsy is contraindicated, because biopsy may cause life-threatening haemorrhage

Differential diagnosis

1. **Exaggerated placental site:** Exaggerated placental site is a benign, non cancerous lesion with an increased number of implantation site intermediate trophoblastic cells that infiltrate the endometrium and the underlying myometrium. An exaggerated placental site may occur with normal pregnancy, or after an abortion. No specific treatment or follow up is necessary.

2. Placental site nodule: Placental site nodules are lesions of chorionic type intermediate trophoblast, usually small. 40 to 50% of placental site nodules are found in the cervix. They almost always are incidental findings after a surgical procedure. Both are composed of intermediate trophoblast, but their morphological features and clinical presentation can differ significantly.

Treatment

1. The treatment for hydatidiform mole consists of the evacuation of pregnancy. Evacuation will lead to the relief of symptoms, and also prevent later complications. Suction curettage is the preferred method of evacuation. Hysterectomy is an alternative if no further pregnancies are wished for by the female patient. Hydatidiform mole also has successfully been treated with systemic (intravenous) methotrexate.
2. The treatment for invasive mole or choriocarcinoma generally is the same. Both are usually treated with chemotherapy. Methotrexate and dactinomycin are among the chemotherapy drugs used in GTN. Only a few women with GTN suffer from poor prognosis metastatic gestational trophoblastic disease. Their treatment usually includes chemotherapy. Radiotherapy can also be given to places where the cancer has spread, e.g. the brain.
3. Women who undergo chemotherapy are advised not to conceive for one year after completion of treatment. These women also are likely to have an earlier menopause.

Follow up

Follow up is necessary in all women with gestational trophoblastic disease, because of the possibility of persistent disease, or because of the risk of developing malignant uterine invasion or malignant metastatic disease even after treatment in some women with certain risk factors.

The use of a reliable contraception method is very important during the entire follow up period, as patients are strongly advised against pregnancy at that time. If a reliable contraception method is not used during the follow-up, it could be initially unclear to clinicians as to whether a rising hCG level is caused by the patient becoming pregnant again, or by the continued presence of GTN.

Prognosis

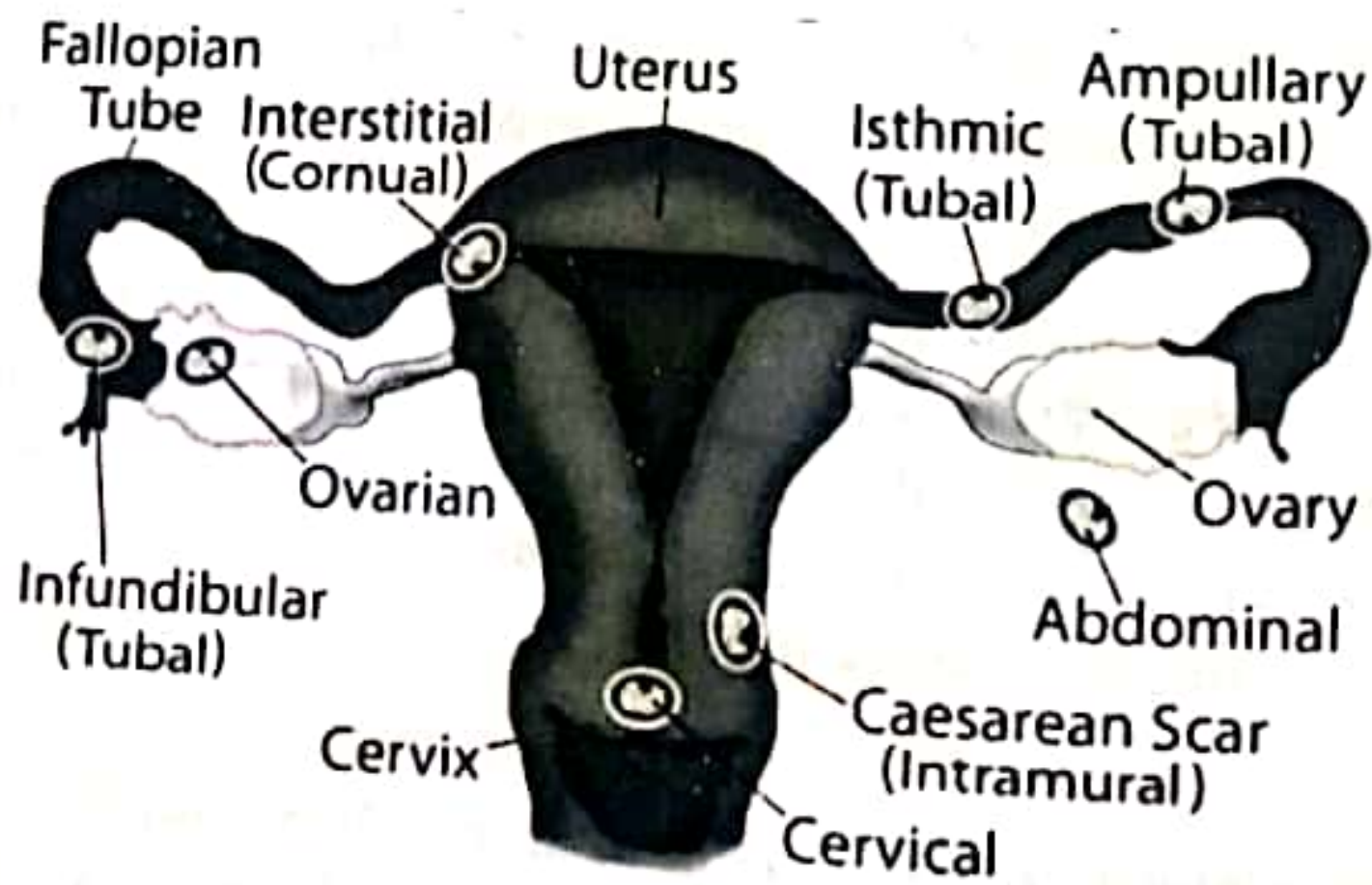
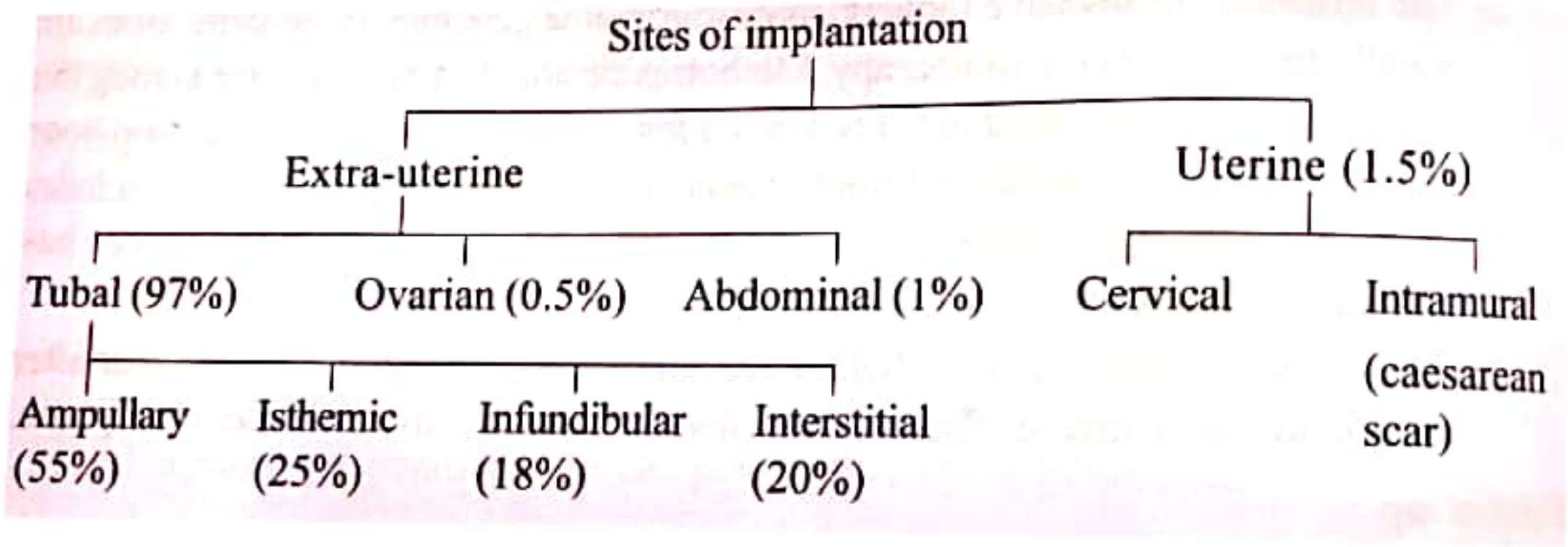
Women with a hydatidiform mole have an excellent prognosis. Women with a malignant form of gestational trophoblastic disease usually have a very good prognosis. Virtually all women with non-metastatic disease are cured and retain their fertility; the

prognosis is also very good for those with metastatic (spreading) cancer, in the early stages, but fertility may be lost. Hysterectomy (surgical removal of the uterus) can also be offered to patients > 40 years of age or those for whom sterilisation is not an obstacle. Only a few women with GTN have a poor prognosis.

Ectopic pregnancy

If due to any cause fertilised ovum is implanted outside the normal endometrial cavity, it is known as ectopic pregnancy.

Ectopic pregnancy still contributes to 10-12% of maternal mortality. Unfortunately incidence of ectopic pregnancy is increasing due to increase in sexually transmitted tubal infections which results in incomplete blocks of tube, following medical termination of pregnancy, tubal ligation, tubal recanalisation and use of assisted reproductive technology. Incidence of ectopic pregnancy is 1 in 200 pregnancies.



Sites of implantation in ectopic pregnancy

Tubal pregnancy

Etiology

- Patient with PID (4% incidence of ectopic)
- Tubal sterilisation (15-20% of pregnancies are ectopic)
- Previous ectopic pregnancy (15%)
- Reconstructive surgery on tube
- Intrauterine devices (9-17% of pregnancies are ectopic)
- Postcoital oestrogen use
- Low dose progesterone use
- Diethylstilboesterol exposure
- Infertility
- Two or more abortions
- In vitro fertilization
- Ovulation induction.

Infections, surgery and drugs can change the physiology of tube resulting in delayed migration of fertilized ovum to uterus or trapping of fertilized ovum into tube. Normally 6 days after fertilization, ovum comes in contact with endometrium. Distortion of tube due to developmental errors or adjacent tumour also results in ectopic. External migration of ovum is sometimes responsible for ectopic.

Pathology of tubal pregnancy

At ectopic sites, decidual reaction is poor and adequate muscular hypertrophy to accommodate growing foetus is not there. So, placentation is inadequate. There is haemorrhage surrounding the villi due to opening of arteriole or artery in the tubal muscularis. Pregnancy is extruded inside the tube and then expelled through tubal os into the peritoneal cavity (tubal abortion) or tube ruptures resulting into intraperitoneal haemorrhage and extrusion of products outside tube. Sometimes ovum is surrounded by blood clots and is retained in tube (Tubal mole) or tube can get distended with blood (Haematosalpinx). Blood may collect around tube and in pouch of Douglas resulting into pelvic haematocele.

Extratubal rupture into peritoneum or broad ligament is common in isthmic ectopic pregnancy as lumen here is narrow and can't distend much.

Clinical Features

1. Short period of amenorrhoea or no amenorrhoea (in 30 to 40%), acute abdomen and bleeding or blood stained discharges per vaginum.

2. Abdominal pain is the most constant symptom. Patient may complain of syncopal attacks.
3. Danforth's sign that is shoulder pain due to sub-diaphragmatic irritation by blood is present in 10% cases.
4. Patient is severely anaemic, hypotensive with tachycardia and abdominal tenderness and shifting dullness is present.
5. There may be bluish discolouration of umbilicus (Cullen sign).
6. Pelvic examination : bulky uterus with tender fornices, cervix is closed and movement of cervix may be painful (Excitation pain). There may be fullness felt through fornices or tender adnexal mass on the side of ectopic pregnancy can be felt.

In chronic cases :

- Pain in abdomen.
- Bleeding for days and months.
- Low grade temperature due to absorption of blood.

Differential diagnosis :

1. Appendicitis.
2. Twisted ovarian tumour.
3. Ruptured corpus luteum.
4. Gut perforation.
5. Splenic rupture.
6. Pelvic inflammatory disease (PID) has almost the similar presentation and it may be quite difficult to differentiate these two.
7. Incomplete abortion, threatened and septic abortion.
8. Tubo ovarian mass.
9. Haemorrhage in endometrial cyst.
10. Urinary tract infection.

Diagnosis depends on clinical history, physical examination, pregnancy test, β hCG estimation & USG

Diagnosis of normal intrauterine pregnancy will exclude need for urgent intervention which is usually required for ectopic pregnancy.

Investigations and Diagnosis

Tube is precious to patients who desire further pregnancy and this can be saved only when diagnosis of ectopic is made in early unruptured state.

- A positive pregnancy test without intrauterine gestational sac 2 week or more after a missed period is almost conclusive of ectopic pregnancy.
- Serum β hCG level can be measured by radioimmuno assay. In normal pregnancy, level of β hCG in serum doubles in 48 hours. If there is failure in this rate of increased β hCG production, it is suggestive of ectopic pregnancy.
- Transvaginal sonography (TVS) can pick up pregnancy by 5th or 6th week in intrauterine site or suspect pregnancy in adnexal region.
- When in doubt, laparoscopy or culdocentesis is indicated to reach at diagnosis. Free blood is seen in peritoneal cavity or blue mass is seen at ectopic site on laparoscopy. In culdocentesis, needling is done through pouch of douglas and blood with small clots can be aspirated in ectopic pregnancy with blood in peritoneal cavity. In unruptured ectopic pregnancy it will be negative if there is no free blood in abdominal cavity.

Treatment

- Hospitalization.
- Raise foot end, set up IV drip with Ringer lactate, send blood for cross matching and don't do vaginal examination.
- Transfusion with blood or plasma may be life saving in acute condition. Intravenous fluids and blood should be pushed rapidly by setting two or three IV fluid lines.
- Treatment of acute ectopic is laparotomy and salpingectomy (excision of fallopian tube) of affected side.
- Other tube and ovary should be seen before sacrificing the tube as sometimes conservative surgery by removal of ruptured segment is possible if other tube is absent or diseased and tuboplasty can be undertaken at later date.
- In chronic cases also laparotomy is required.
- Treatment of ectopic and in unruptured ectopic pregnancy instead of salpingectomy one can do conservative surgery like salpingostomy, salpingotomy or segmental resection of tube to improve future fertility.

Ectopic Pregnancy Other than Tubal Pregnancy

Ovarian Pregnancy

Clinical picture is same as for tubal pregnancy and ruptured corpus luteum and haemorrhagic cyst make the differential diagnosis. Histopathology of excised tissue clinches the diagnosis. Mostly oophrectomy is needed for this condition.

Pregnancy in Rudimentary Horn

Pregnancy is carried for longer period as pregnancy sac is covered by myometrium,

rupture of horn may take place at 14 to 20 weeks, so this is extremely dangerous condition. It can be confused with interstitial pregnancy, because here tube is surrounded by uterine musculature and rupture takes place by 12th week. Round ligament is always inserted lateral to horn pregnancy. Degenerating painful fibroid is important differential diagnosis. USG and diagnostic laparoscopy settles the diagnosis. The affected horn should be removed.

Cervical Pregnancy

Here after abortion, patient bleeds profusely as cervix does not retract. Important differential diagnosis is carcinoma cervix. In cases of severe haemorrhage emergency hysterectomy may be required.

Abdominal Pregnancy

Usually it occurs secondary to tubal pregnancy when graded disruption and extorsion of ovum and implantation of placenta in omentum and gut allows the pregnancy to continue in peritoneal cavity. After varying period, the foetus may die. Patient may give history suggestive of tubal pregnancy and gets attacks of abdominal pain, bleeding off and on and intestinal distension may be present. Mass is felt in abdomen and uterus be felt separate from the mass on pelvic examination. Wrong diagnosis of fibroid or ovarian tumour can be made. Many cases are missed initially then diagnosis may be made on careful examination. Lateral X-ray shows some part of foetal skeleton on plain posterior to anterior border of maternal spine or gas shadows in maternal intestines super-imposed on foetus. Treatment is laparotomy and removal of foetus.

Intraligamentary Pregnancy

Presentation is same as abdominal pregnancy and treatment is laparotomy and removal foetus and placenta after opening broad ligament.

Intra Uterine Growth Retardation (IUGR)

IUGR is a pathological decrease in the rate of foetal growth. However, for all practical purposes, we consider the foetus as growth retarded, when its weight is below the 10th percentile or less than two Standard Deviation (SD) below the mean weight for a given gestational period.

Aetiology

Aetiology of IUGR is multifactorial and can occur due to :

Maternal causes	30-35 %
Placental causes	30-35 %
Foetal causes	10-20 %
Combined maternal and foetal causes	5-10 %

The main conditions in each of the above category are as follows :

Maternal Causes

- Preeclampsia
- Chronic hypertension
- Chronic renal disease
- Connective tissue disorder
- Diabetes with vascular lesions
- Sickle cell anaemia
- Cardiac disease
- Class III or IV Severe malnutrition
- Smoking
- Alcohol ingestion
- Viral infection like rubella
- Protozoal infections like toxoplasmosis
- Bacterial infections like listeria monocytogens, malaria.
- Teratogenic drug uses like phenytoin

Optimal placental function is essential for foetal growth and well being. The following conditions in mother lead to decrease in the placental perfusion and thereby causes placental insufficiency.

Placental Causes

- Abnormal placentation
- Chronic villitis
- Placental infarcts
- Placental hemangiomas
- Chorioangiosis
- Hemorrhagic endovasculitis
- Placenta previa

Foetal Causes

- Multifactorial defects
- Infections
- Multiple pregnancies
- Congenital heart disease

Classification

The growth retarded infants are classified as Type I, Type II and Type III.



Symmetric IUGR (Type I)

Symmetric IUGR accounts for one third of all cases of IUGR and is due to low genetic growth potential, intra uterine infection, severe maternal malnutrition, chromosomal aberrations and congenital anomalies. Usually the insult is operative before 16 weeks of gestation. A symmetrically growth retarded infant is small in all parameters as there is an intrinsic foetal pathology. Postnatal catch up of growth is poor and long term prognosis is unfavourable.

Asymmetric IUGR (Type II)

Asymmetric IUGR accounts for two thirds of IUGR babies and results from placental insufficiency in high risk pregnancy cases like hypertension, anaemia, heart disease, bleeding during pregnancy etc. Thus IUGR usually begins in the second or early third trimester and there is relative sparing of cell size. The infant has a long, thin and wasted appearance. Head size is proportionately bigger than trunk size. These infants have a normal postnatal catch up and long term prognosis is good.

Features of symmetrical and asymmetrical IUGR foetuses

Symmetrical	Asymmetrical
Uniformly small	Head larger than abdomen
Ponderal index (Birth weight/Crown-heel length ³)-normal	Low
HC : AC and FL : AC ratios-normal	Elevated
Etiology : genetic diseases or infection- (Intrinsic to foetus)	Chronic placental insufficiency- (Extrinsic to foetus)
Total cell number - less	Normal
Cell size - normal	Smaller
Neonatal course - complicated with poor prognosis	Usually uncomplicated having good prognosis

Intermediate IUGR (Type III)

This is due to mixed aetiology. To begin with IUGR is symmetrical but becomes asymmetric during later part of pregnancy as extrinsic insult is superimposed on intrinsic foetal problems. The foetal complications which are likely to occur, manifest not only during pregnancy but also during neonatal and late neonatal period.

Physical Features at Birth

- Weight deficit at birth is about 600 gm below the minimum in percentile standard.

- Length is unaffected.
- Head circumference is relatively larger than the body in asymmetric variety.
- Physical features show dry and wrinkled skin because of less subcutaneous fat, scaphoid abdomen, thin meconium stained vernix caseous and thin umbilical cord. All these give the baby in old man look. Pinna of ear has cartilaginous ridges.
- The baby is alert, active and having normal cry. Eyes are open.
- Reflexes are normal including Moro-reflex.

Foetal Complications

The complications can take place during antepartum, intrapartum or neonatal period,

a) Antepartum complications

Still Birth : There is a definite relationship between intrauterine malnutrition and still births. It has been recorded that IUGR is responsible for 20-30% of all cases of still births. Foetal death in IUGR may occur at any time, but occurs more frequently after 35 weeks of gestation.

Oligohydramnios : The degree of oligohydramnios is being considered as an important factor in the prognosis of foetal outcome. It is possible that oligohydramnios in IUGR is caused due to the decreased foetal urinary output as a result of decreased renal blood flow caused by redistribution of blood flow with preferential shunting of blood to the brain.

b) Intrapartum Foetal Acidosis

On electronic foetal monitoring there will be late decelerations, severe variable decelerations, decreased beat to beat variability and frequent episodes of bradycardia. Acidosis is said to manifest during labour or in about 40% of cases resulting in high incidence of caesarean delivery.

c) Neonatal Complications

The new born weight is below 10th percentile. The typical picture of an IUGR infant is loose skin with very little subcutaneous fat. Most of the time, the head circumference is larger than abdominal circumference. The neonatal course of an IUGR infant is different from that of constitutionally small baby.

The most important complications are related to :

- 1) **Perinatal asphyxia and acidosis :** Meconium aspiration syndrome and hypoxic ischaemic encephalopathy.
- 2) **Metabolic disturbances :** Hypoglycemia, hypocalcemia, hyperviscosity, hypothermia.

3) Specific causes of foetal retardation: Infection, chromosomal abnormalities

Screening and Diagnosis.

It is absolutely necessary to screen for IUGR so that these cases can be investigated further and managed appropriately.

The challenge is to identify the foetus who is growing inappropriately in the uterus. As already discussed, true IUGR occurs in certain group of mothers. Therefore, doctor should take a good history and use the gravidogram in order to identify foetal growth retardation.

a) History

A detailed history is taken to identify high risk population. The following is an exhaustive list which should be elicited during history taking:

General History

- Age: < 17 or > 35 years
- Low socio economic status
- Smoker/alcoholic/drug addict.
- High altitude
- Low pre pregnancy weight < 50 kg
- Stature < 145 cms

Past Obstetric History

- Previous history of IUGR
- Previous abortions, still births and neonatal death
- Chromosomal or congenital anomalies
- Hypertension
- Renal disease
- Systemic lupus erythematosus
- Severe cardio pulmonary disease
- Haemoglobinopathy
- Urinary tract infection

Present Pregnancy

- Viral infection
- Radiation exposure
- Drugs intake
- Multiple pregnancy

- Bleeding during pregnancy
- Preterm contractions

b) Uterine Fundal Height Measurement

Serial measurements of fundal height should be plotted against a standard curve; if the value is below 50th percentile, it should arise a suspicion of IUGR. All such cases can be referred for specialized care. With the help of gravidogram 45-80% of Small for Gestational Age (SGA) foetuses can be identified.

Inappropriate foetal growth can also be suspected if the fundal height measurement is 2 cm less than the measurement for the appropriate period of gestation. If there is a discrepancy of more than four weeks between the actual height and expected height of uterus, IUGR can be diagnosed.

c) Confirmation of Diagnosis

It is difficult to diagnose IUGR clinically unless the growth retardation is very gross. Therefore, once IUGR is suspected, it is necessary to confirm it by ultrasound. In addition to confirming the diagnosis, ultrasound examination can be used very effectively for monitoring the foetal well being.

Head Circumference/Abdominal Circumference (HC/AC) Ratio : It is useful to know that HC/AC ratio can detect asymmetrical IUGR in uteroplacental insufficiency. Normally the ratio should decrease as the gestational age increases. With loss of fat and subcutaneous tissue the ratio will increase. In normal pregnancy HC/AC is more than one till 32 weeks; one between 32-36 weeks and less than one after 36 weeks. HC/AC ratio can also be used to distinguish between asymmetrical and symmetrical IUGR, as in symmetrical IUGR the ratio continues to be one or less.

d) Femoral Length/Abdominal Circumference (FL/AC) Ratio

FL/AC is a gestational age independent variable. After 20 weeks of gestation FL/AC ratio, remains same till term in normal pregnancy. The normal ratio is 22 (± 2). Any value above, 24 denotes IUGR. But FL/AC ratio is not useful in determining symmetrical IUGR.

e) Amniotic Fluid Index (AFI)

An association between IUGR and decreased amniotic fluid volume is well recognised. Utero placental insufficiency results in foetal hypoxia with a diminished renal plasma flow and decreased glomerular filtration with less urine formation. A liquor pocket size of 1cm or less is considered abnormal. Correlating foetal outcome with liquor pocket size, it is observed that with a pocket of less than 1 cm, perinatal mortality was 187.5

per 1000, with a marginal pocket of 1 to 2 cm, the perinatal mortality was 4.65 per 1000, while with normal liquor volume, it was 1.97/1000.

f) Foetal Ponderal Index (FPI)

A growth retarded foetus is essentially malnourished with lack of subcutaneous fats. This can be detected with the help of a Index (PI); PI below 10th percentile is taken as IUGR Ponderal index = Birth weight/(Crown heel length)³

g) Doppler Ultrasound

A decrease in utero placental blood flow is an important event that occurs in IUGR. Hence, assessment of doppler flow in uterine, umbilical or internal carotid artery not only helps in detection of cases of IUGR but also gives an indication of the degree of foetal compromise.

Wave form analysis on doppler studies by demonstrating resistance to blood flow in foetal umbilical and uterine vessels can predict foetal well being. The peak systolic and end diastolic volume is measured and systolic to diastolic flow of < 3 is taken as normal in umbilical and uterine artery. Comparison of umbilical and foetal carotid velocimetry also has a high predictive value to detect a compromised foetal state. Flow velocity wave forms also relate to foetal outcome. Lack of diastolic component or reversed end diastolic flow in umbilical vessels or descending aorta is an ominous sign. Such pregnancies either need to be terminated or require to be intensely monitored.

Management of IUGR

a) **Antepartum Foetal Surveillance** : Antepartum foetal monitoring in case of IUGR which includes monitoring of both foetal growth and foetal wellbeing.

b) **Foetal Growth Monitoring** : Besides clinical examination of symphysis fundal height, baby size and amount of amniotic fluid, serial estimation of biparietal diameter (BPD) is important. BPD growth of < 2 mm per week between 13-34 weeks or < 1 mm per-week between 35-40 weeks indicates poor foetal growth.

c) **Foetal Wellbeing** : Methods to assess foetal wellbeing include foetal kick count, Foetal Heart Rate (FHR) monitoring, Non stress test (NST), Contraction Stress Test (CST), and Biophysical Profile Score (BPS) and amniotic fluid Index (AFI).

Management during Pregnancy

All cases where IUGR is confirmed should be admitted to the hospital. Attempts should be made to control underlying factors like hypertension. Appreciate that bed rest especially in left lateral position improves placental perfusion thereby helping foetal growth. Drugs like progestogens, Beta sympathomimetics and low dose aspirin have been administered in the hope of improving foetal prognosis.

However, their value has not been proven definitely. One of the serious foetal complication was meconium aspiration syndrome; some studies have shown that amnioinfusion not only reduces the risk of this complication, but also contributes to foetal growth.

Management during Delivery

i) Factors Governing Decision for Termination : As a rule, no patient with IUGR should be allowed to go beyond term. A biophysical profile and scoring can be done, but at this point we would like to reiterate that more importance should be given to AFI, NST and foetal breathing movements. Low scores indicate an immediate termination of pregnancy. However, before resorting to intervention, the doctor must ensure the facilities available for care of preterm and growth retarded babies.

Besides the dictates of scores of biophysical profile, deterioration in maternal condition (e.g. persistent hypertension) is another indication for termination of pregnancy.

ii) Mode of Delivery : The mode of delivery depends on:

- Degree of foetal compromise
- Presence of other risk factors
- Foetal presentation
- Favourability of cervix
- Availability of facilities for intrapartum monitoring

Ensure the following when labour is established:

- An episiotomy
- Cutting short of 2nd stage of labour
- Early cord clamping in order to avoid circulation overload
- Presence of a neonatologist

iii) Indications for Caesarean Section :

- Obstetrical complication like hypertension, antepartum haemorrhage associated with IUGR
- Period of gestation less than 35 weeks
- Unfavourable cervix

iv) Intrapartum Monitoring : Intrapartum asphyxia is the leading cause of foetal death. Hence, these patients require intensive intrapartum monitoring. Continuous foetal monitoring using scalp electrode and scalp blood sampling is recommended. In the

absence of these facilities, FHR is monitored every 15 minutes during first stage and every five minutes in the second stage.

v) **Neonatal Care** : Special neonatal problems in IUGR babies are hypoglycaemia, hypocalcaemia, hyperviscosity, necrotizing enterocolitis. A small for gestational age infant (SGA) far better than an appropriate for gestational age infant having same weight.

The neonatal care should include :

- 1) **Resuscitation** : There is all increased risk of perinatal asphyxia in SGA infants. Resuscitation starts at delivery table with adequate suction. Meconium staining of liquor is common in IUGR leading to meconium aspiration syndrome. This is taken care of by timely suction through a laryngoscope. Oxygen as well as intubation facility should be done. If respiratory effort is poor continuous pressure ventilation (CPAP) helps in assisted ventilation.
- 2) **Supportive Care** : This includes attention to ventilation, oxygenation, cardiac output, tissue perfusion and glucose, fluid, electrolyte and acid-base balance.
- 3) **Maintenance of Temperature** : Both cold and heat put a stress on metabolic and physiologic homeostasis. Thermal neutrality is the temperature zone at which infant oxygen consumption is minimum. Generally this correlated with skin temperature between 36° to 36.5°C . During winter months delivery place as well as infant crib should be kept warm before the arrival of infant to prevent sudden fall in temperature. Undue exposure of the infant should be avoided:
- 4) **Prevention of Infection** : Prophylactic antibiotics should be given.
- 5) **Nutrition** : It must realise the importance of close monitoring of glucose levels of the baby and need for immediate feeding of the baby to avoid hypoglycemia. The lower acceptable limit for glucose concentration is 40-45 mg/dl. If level is not being maintained with oral feeding, intravenous glucose infusion is given. In a preterm SGA infant glucose infusion is routinely given soon after birth.
- 6) **Treatment of Polycythemia** : Venous haematocrit of more than 60 % is present in 50% SGA infants. These infants may have neurologic, pulmonary or cardiac symptoms including lethargy, jitteriness, poor feeding, respiratory distress, cyanosis and occasional seizures. The infants are also more prone to hyperbilirubinemia. Partial plasma exchange is carried out in symptomatic infants.
- 7) **Treatment of Congenital Infection** : There may be congenital infection with rubella, CMV, toxoplasma etc. which had caused IUGR initially. The infants born may be completely asymptomatic but should be screened for the presence of infection and treated.

Low Birth Weight

Definition

Low birth weight (LBW) is defined by the World Health Organization as a birth weight of a infant of 2,499 g or less, regardless of gestational age.

Very low birth weight (VLBW) - which is less than 1500 g (3 pounds 5 ounces).

Extremely low birth weight (ELBW) - which is less than 1000 g (2 pounds 3 ounces).

Normal weight at term delivery is 2500–4200 g (5 pounds 8 ounces – 9 pounds 4 ounces).

Cause

- LBW is either caused by preterm birth (i.e a low gestational age at birth, commonly defined as younger than 37 weeks of gestation) or the infant being small for gestational age (i.e a slow prenatal growth rate), or a combination of both.
- In general, risk factors in the mother that may contribute to low birth weight include young ages, multiple pregnancies, previous LBW infants, poor nutrition, heart disease or hypertension, untreated coeliac disease, drug addiction, alcohol abuse, and insufficient prenatal care. Environmental risk factors include smoking, lead exposure, and other types of air pollutions.

Causes of Preterm birth

- Precocious foetal endocrine activation
- Uterine overdistension
- Decidual bleeding
- Intrauterine infection.

Causes of small for gestational age

- Being small for gestational age, it can be secondary to intrauterine growth restriction, which can be secondary to many possible factors. For example, babies with congenital anomalies or chromosomal abnormalities are often associated with LBW.
- Infections during pregnancy such as rubella, cytomegalovirus, toxoplasmosis and syphilis, may also affect the baby's weight.

Environmental factors

- The mothers who smoke during pregnancy are twice as likely to give birth to low-birth weight infants.

- Regarding environmental toxins in pregnancy, elevated blood lead levels in pregnant women, even those well below 10 ug/dL can cause miscarriage, premature birth, and LBW in the offspring.
- One environmental exposure which has been found to increase the risk of low birth weight is particulate matter, a component of ambient air pollution.

Effects

LBW is closely associated with foetal and perinatal mortality and morbidity, inhibited growth and cognitive development, and chronic diseases later in life. At the population level, the proportion of babies with a LBW is an indicator of a multifaceted public-health problem that includes long-term maternal malnutrition, ill health, hard work and poor health care in pregnancy.

Management

- Feeding.
- Temperature maintenance.
- Hygienic cord and skin care.
- Early detection and treatment of infections and complications including respiratory distress syndrome.

Kangaroo Mother Care

Kangaroo mother care is a method of care of preterm infants, particularly those weighing less than 2 kg. It includes exclusive and frequent breastfeeding in addition to skin-to-skin contact and support for the mother-infant dyad, and has been shown to reduce mortality.

Method for giving KMC

1. Kangaroo position : The infant is placed almost naked in strict upright ventral position between the mother's breast, in direct contact with her skin, as long as possible.
2. Kangaroo feeding and nutrition strategy : Ideally exclusive breastfeeding to have a weight gain similar to the growth during the intra uterine life (15 g/Kg/day) until full term.
3. Early discharge and strict ambulatory follow up : Discharge in kangaroo position regardless of weight and gestational age when the child is able to coordinate sucking, swallowing and breathing, gaining weight for 3 days and have parents informed, trained and ready to come to follow up visits.

Specific clinical interventions

WHO guidelines include interventions provided to the mother - for example steroids injections before birth, antibiotics when her water breaks before the onset of labour, and

magnesium sulfate to prevent future neurological impairment of the child, as well as interventions for the newborn baby - for example thermal care, feeding support, (e.g. kangaroo mother care, when babies are stable), safe oxygen use, and other treatments to help babies breathe more easily.

Intrauterine Foetal Death (IUFD)

Involuntary loss of pregnancy at any gestation is foetal demise. Foetal death, as defined by the World Health Organisation (WHO) is 'death prior to the complete expulsion or extraction from its mother of a product of human conception, irrespective of the duration of pregnancy. The death is indicated by the fact that after such expulsion or extraction, the foetus does not breathe or show any other evidence of life, such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles.

For statistical purposes, however, it is recommended by the WHO that intrauterine foetal death occurring after 22 weeks or foetal weight > 500 g when gestational age is not known, should be classified as foetal death (stillbirth), to differentiate it from early pregnancy loss of spontaneous abortion.

Risk Factor associated with foetal death

Maternal

- Advance maternal age (>35 years)
- Obesity
- Race
- Low socioeconomic status
- Low educational status
- Smoking

Foetal

- Congenital malformations
- Chromosomal defects - Monosomy X, trisomy 21, 18, 13
- Male sex

Pregnancy complications

- IUGR
- Pregnancy induced hypertension
- Pre-eclampsia, Eclampsia
- Placental abruption
- Rh isoimmunisation
- Multiple pregnancy

- Post-term pregnancy
- Infections
- Antepartum asphyxia
- Previous history of stillbirth, IUGR
- Nuchal cord or knotted cord

Medical disorders

- Diabetes
- Hypertension
- Chronic nephritis
- Systemic lupus erythematosus
- Thrombophilias
- Cholestasis of pregnancy

Infection

- Viruses : Parvovirus B₁₉ and Cytomegalovirus
- Bacteria : Listeria monocytogenes, Escherichia coli, Group B streptococci, Ureaplasma urealyticum, Treponema Pallidum
- Malaria

Diagnosis

Clinically, IUFD is suspected when the mother reports loss of foetal movements or the fundal height on palpation is found to be less for the estimated gestational age (if dates have been confirmed earlier with dating ultrasound), more so if the fundal height has been found to regress compared to the previous documentation. Absence of foetal heart sound on auscultation or doppler is suggestive and adds to the clinical suspicion, it should be confirmed on ultrasonography by noting the absence of foetal heart activity.

Straight x-ray abdomen reveals appearance of gas shadow in the chambers of the heart & great vessels (Robert's Sign), hyperflexion of the spine, crowding of ribs shadow, irregular overlapping of the cranial bones on one another (spalding sign.). Now x-ray abdomen is rarely done.

Evaluation

About 20% of foetal deaths remain unexplained despite adequate evaluation. A thorough evaluation must be undertaken in every case to identify the likely cause of stillbirth, which will help in counselling the patient regarding the need for prenatal diagnosis and

preconception management in future pregnancies. This must include a detailed history, laboratory evaluation to exclude maternal disease, test for foetal maternal hemorrhage (Kleihauer-Betke test), cytogenetic studies, examination of the newborn and the placenta, and autopsy.

History

Relevant maternal and obstetric factors must be reviewed keeping in mind the risk factors as described above. Family history particular of pregnancy losses, congenital malformations mental retardation and diabetes should be elicited.

Laboratory and cytogenetic evaluation

An amniocentesis should be considered for cytogenetic diagnosis, if not already done during pregnancy. 10-25 ml of amniotic fluid is aspirated. Alternatively, cord blood or cardiac blood can be taken after delivery for cytogenetic studies, bacterial culture and TORCH serology. Maternal laboratory evaluation should include ABORH, fasting or random blood glucose level, HbA_{1c}, VDRL, antiphospholipid antibodies, and Kleihauer-Betke test.

Management

Spontaneous labour usually ensues after intrauterine death in 80-90% women within two weeks. In those that do not go into labour, there is a risk, although quite rare, of hypofibrinogenemia and consumptive coagulopathy. It does not usually occur prior to 3-4 weeks of retention of the dead foetus. This risk increases in cases with maternal sepsis, placental abruption and pre-eclampsia. Infection is a risk, if membranes are ruptured.

Induction of labour

Labour can be induced by oxytocin infusion in titrating doses. When the cervix is unfavorable, or in pregnancies remote from term, prostaglandins are generally more effective than oxytocin alone. Prostaglandin E₂, F₂α, and more recently misoprostol, a synthetic E₁ analogue, have all been used for induction of labour.

Multiple pregnancy

When more than one foetus simultaneously develops in the uterus, it is called multiple pregnancy. Simultaneous development of two foetuses (twins) is the commonest; although rare development of three foetuses (triplets), four foetuses (quadruplets), five foetuses (quintuplets) or six foetuses (sextuplets) may also occur.

According to Hellin's rule (1895), the mathematical frequency of multiple births, twins 1 in 80 pregnancies, triplets 1 in 80², quadruplets 1 in 80³ and so on.

Etiology

The etiology of multiple pregnancy is unknown in most cases. The frequency of uniovular twins remains constant throughout the globe and is due to unrelated cause in the local environment in blastomere stage. It is the wide variation in the prevalence of binovular twins which is responsible for the fluctuation in the overall incidence of twins in different populations. Binovular twins are three times more common than uniovular twins. The cause is either hereditary or due to multiple ovulation induced by drugs in infertility or in IVF programme (multiple embryo transfer).

Binovular/Fraternal/Dizygotic Twins

Binovular twins result from fertilization of two ova by two sperms during a single ovarian cycle. The babies bear only fraternal resemblance to each other (that of brothers and sisters from different births) and hence are called fraternal twins. Binovular twins are dichorionic diamniotic.

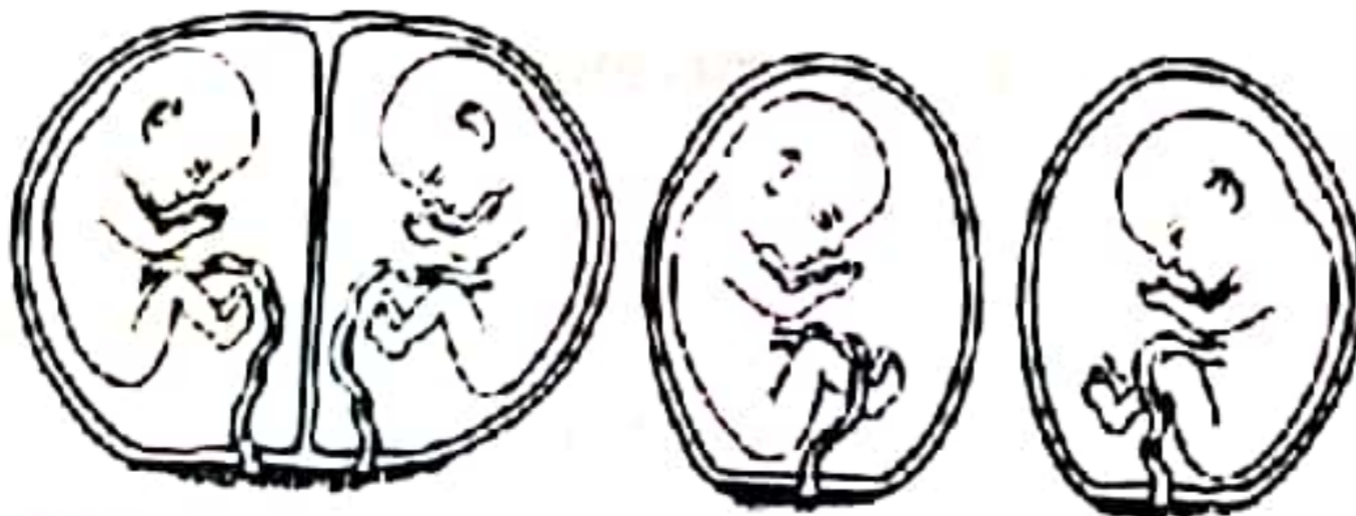
Prevalence of binovular twins is related to :

Race: The frequency is highest amongst negroes, lowest among mongols and intermediate among caucasians.

Hereditary: A tendency to plural births does run in families, more often on the maternal side.

Age: The maximum incidence being between 30-35 years. Incidence of twins is markedly reduced thereafter.

Monamniotic-monochorionic Diamniotic-dichorionic (Fused)



Diamniotic-monochorionic Diamniotic-dichorionic (Separated)

Parity: Incidence is increased with increasing parity.

Iatrogenic: 20-40% of pituitary gonadotropin and 5-6% of clomiphene induced ovulations result in multiple pregnancy.

Uniovular/Identical/Monozygotic Twins

Uniovular twins arise from the division of one fertilised ovum into two separate embryos. As might be expected, uniovular twins are like two beans out of the same pod and are always of the same sex and identical.

Genesis of Uniovular Twins

The type of placenta that develops in a monozygotic twin pregnancy is determined by the time at which cleavage of the fertilized ovum occurs :

- If twinning is accomplished during the first 2 to 3 days, two amnions and two chorions (2 placentas) are formed.
- If the split occurs between 3 to 8 days a diamniotic monochorial placenta develops.
- Between 8 to 13 days, the amnion has already been formed and the placenta is therefore monoamniotic and monochorionic.
- Embryonic cleavage between 13 -15 days results in conjoined twins with a single amnion and chorion.
- Beyond that point, the process of twinning cannot occur. Conjoined twins are extremely rare. Monoamniotic twins will have high mortality because of cord entanglement.

Diagnosis

Early diagnosis and appropriate management will go a long way in preventing the complications associated with twin pregnancy.

History

- a) History of ovulation inducing drugs (especially gonadotropins and clomiphene) for infertility.
- b) Family history of twinning.

Symptoms

- a) Increased nausea and vomiting in first trimester.
- b) Cardio respiratory embarrassment in later months due to over distension of uterus.
- c) There is a greater tendency towards swelling of the legs, varicose veins and haemorrhoids.

- d) Unusual rate of abdominal enlargement and excessive foetal movements may be noticed by a parous mother.

Signs

- a) Anaemia is more common than in singleton pregnancy. This is because of increased demand by the foetuses. Both iron deficiency and folic acid deficiency prevails.
b) Unusual weight gain, not explained by toxemia or obesity, is an important feature.

Abdominal Examination

- a) **Inspection:** The elongated shape of a normal pregnant uterus is changed to a more "barrel shape" and the abdomen is unduly enlarged.
b) **Palpation:** The fundal height is more than the period of amenorrhea. This discrepancy may only become evident from mid pregnancy onwards. Foetal bulk seems disproportionately larger in relation to the size of the foetal head. Palpation of too many foetal parts, finding of two foetal heads or three foetal poles makes the clinical diagnosis almost certain.
c) **Auscultation:** Auscultation may be useful as a confirmatory sign. If two independent observers listening simultaneously hear two foetal hearts distinctly in two different areas, well separated from each other, the foetal hearts differing in frequency by at least ten beats, the possibility is that it is a case of twin pregnancy.

In hydramnios, which occur in 12% of these cases, abdominal palpation and auscultation of foetal heart is difficult.

Internal Examination

Occasionally, it may be possible when the woman is in labour to make out the presence of one cephalic pole distinctly by vaginal examination and feel the other at the fundus by abdominal palpation. The size of head and may be breech which is smaller than expected from the abdominal examination, make to suspect the presence of another foetus.

Ultrasound

Ultrasound as early as 6 weeks will show two gestational sacs. Foetal heart motion is seen by eight weeks. Ultrasound screening for all pregnant woman during the second trimester would help in the early diagnosis of multiple pregnancies with almost 100 per cent accuracy.

Ultrasound would also detect intrauterine growth retardation, twin to twin transfusion syndrome, hydramnios and congenital anomalies (all of which are more common with uniovular twins).

In dichorionic-diamniotic pregnancies, the dividing membrane appears thick by ultrasound, with a thickness of 2 mm or more, as it has 4 layers. In monochorionic-diamniotic pregnancies, the membrane has only two layers, and is thin and "hair like".

The rare conjoined twins can be suspected on ultrasound when the body parts of the twins are on the same level and there is no change in the relative positions of the twins to one another on successive scans. Cephalopagus (one hand, two bodies) and pyopagus (one buttock, two heads) are clearly evident on ultrasound.

Differential Diagnosis

- Wrong dates
- Vesicular mole in early pregnancy
- Hydramnios
- Big baby
- Fibroid or ovarian tumour with pregnancy

Complications

Because of increased maternal and foetal complications, twin pregnancy is considered a "high risk pregnancy". The complications are generally higher in monozygotic than in dizygotic twin pregnancies, and this is certainly so for foetal malformations and the hazards arising from the shared placental circulation of most monozygotic twins.

Antenatal Complications

- 1) Abortion
- 2) Hyperemesis
- 3) Anaemia
- 4) Preeclampsia
- 5) Hydramnios
- 6) Antepartum hemorrhage
- 7) Malpresentation
- 8) Preterm labour
- 9) Mechanical distress
- 10) Intrauterine growth retardation
- 11) Intrauterine death
- 12) Congenital malformations
- 13) "Twin to twin" transfusion syndrome
- 14) Conjoined twins

Intranatal Complications

- 1) Early rupture of the membranes and cord prolapse
- 2) Prolonged labour
- 3) Increased operative interference
- 4) APH following the birth of the first baby
- 5) Postpartum haemorrhage
- 6) Interlocking of twins

Postnatal Complications

- 1) Secondary PPH
- 2) Subinvolution
- 3) Infection
- 4) Lactation problems

Prognosis

Maternal mortality is increased. Death is mostly due to hemorrhage (before, during and after delivery), toxæmia and anaemia. Increased maternal morbidity is due to the prevalence of complications and increased operative interference.

Perinatal mortality is markedly increased due to prematurity and IUGR and is 4-5 times higher than in a singleton pregnancy.

Management

Antenatal Management

- Once diagnosis is made:
- Provide routine antenatal care
 - Increase dietary supplement
 - Iron therapy should be increased upto 60-100 mg/day
 - Serial USG at every 4 weeks interval to assess foetal growth, AFI.
 - Detect complications early

Management of Second Stage of Labour

Delivery of First Twin :

- 1) Adequate episiotomy under pudendal anesthesia saves the injury to both the forecoming and the aftercoming head of a preterm baby.
- 2) Forceps should be applied when indicated, under pudendal block.
- 3) Do not give intravenous ergometrine or methergin with the delivery of anterior shoulder of the first baby.

- 4) Soon after delivery of first twin, clamp the cord at two places and cut in between, to prevent exsanguination of the second baby in cases of uniovular twins (it is a usual practice even in singleton births).

Delivery of Second Twin :

- 1) After the first baby is delivered, remove the gloves and do an abdominal examination to check the lie of the second twin, and also check the foetal heart.
- 2) If the lie is longitudinal (vertex or breech) a vaginal examination can be done after 5-10 minutes (or immediately if membranes rupture). The presenting part can be fixed, and artificial rupture of membranes carried out. If contractions are not effective, 2 units oxytocin should be added to 500 ml. of dextrose normal saline as IV drip given. Delivery can be hastened by forceps (in vertex) or breech extraction (in breech) in the presence of vaginal bleeding, foetal distress or cord prolapse. Otherwise a normal vaginal or assisted breech delivery is conducted in the usual manner.
- 3) After delivery of the first twin if abdominal examination reveals the lie is oblique or transverse, then external version should be attempted. If external version succeeds then the ensuing longitudinal lie is managed as described in the previous paragraph. If external version fails, or membranes rupture and cord prolapse occurs, internal podalic version and breech extraction will have to be done under general anesthesia.
- 4) Prophylactic methergine 0.2 mg IV should be given at the delivery of anterior shoulder of second baby in vertex presentation.
- 5) After delivery of second twin the cord is clamped promptly and baby handed over to the paediatrician.

Management of Third Stage

- 1) 10 to 20 units of oxytocin should be added to the intravenous infusion to prevent atonic postpartum hemorrhage.
- 2) Examination of the placenta to conform the complete expulsion.

Indication of Caesarean section

- i) Both the foetuses or even the first foetus with noncephalic (breech or transverse) presentation.
- ii) Twins with complications : IUGR, Conjoined twins
- iii) Monoamniotic twins
- iv) Monochrionic twins with twin transfusion syndrome.
- v) Collision of both the heads at brim preventing engagement of either head.
- vi) Obstetric indication— Placenta praevia, Severe preeclampsia, Previous caesarean

section, Cord prolapse of the first baby, Abnormal uterine contractions, Contracted pelvis.

Management of Puerperium

- Subinvolution is common in twin pregnancy because of the overdistended uterus.
- Infection should be diagnosed and treated early.
- Mother should be given advice and support during breast feeding.
- Nutrition of mother should be emphasised.

गर्भिणी व्यापद्

गर्भिणी व्याधियों की विशिष्ट चिकित्सा का विस्तृत वर्णन आचार्य काश्यप ने खिलस्थान के दसवें अध्याय (अन्तर्वत्नीचिकित्सा अध्याय) में किया है। ज्वर आदि विकारों के जो-जो लक्षण अत्राद बालक में होते हैं वे ही गर्भिणी स्त्री के भी समझना चाहिए।

महर्षि हारीत ने आठ गर्भोपद्रवों का वर्णन किया है—

शोषो हल्लासच्छर्दिश्च शोफो ज्वरस्तथारुचिः ।
अतीसारो विवर्णत्वमष्टौ गर्भस्योपद्रवाः ॥

(हा.सं. तृतीय स्थान 51/1)

शोष, हल्लास, छर्दि, शोफ, ज्वर, अरुचि, अतिसार एवं विवर्णता ये आठ गर्भ के कारण गर्भिणी में उत्पन्न होने वाले उपद्रव हैं।

गर्भिणी व्याधियों का सामान्य चिकित्सा सिद्धान्त

व्याधींश्चास्या मृदुमधुर शिशिर सुख सुकुमार प्रायैरौषधाहारोपचारैरुपचरेत्..... स्यात् ।

(च.सं.शा. 8/22)

अथ गर्भिणीं व्याध्युत्पत्तावत्यये छर्दयेत्.....मृदुप्राया। (सु.सं.शा. 10/71)

- मृदु, मधुर, शीतवीर्य, सुखकारक एवं सुकुमार औषधियों का प्रयोग।
- वमन, विरेचन, शिरोविरेचन, अष्टम मास के पूर्व अस्थापन एवं अनुवासन वस्ति का प्रयोग नहीं करना चाहिए।
- अष्टम मास प्राप्त हो जाने पर वमन आदि से साध्य व्याधियों में अत्यधिक अवस्था में मृदु वमन या तदर्थकारी उपचारों द्वारा चिकित्सा।
- टीकाकार चक्रपाणि ने वमन के स्थान पर निष्ठीवन, विरेचन के स्थान पर फलवर्ति तथा नस्य के स्थान पर शिरोवस्ति का प्रयोग बताया है।
- मृदु वीर्य, मधुर प्राय एवं गर्भ को हानि न पहुँचाने वाले भोजन का सेवन।
- आचार्य हारीत ने गर्भिणी को दारुण विरेचन का निषेध किया है।

गर्भिणी की विशिष्ट व्याधियों की चिकित्सा

- चतुर्थ मास में यदि गर्भिणी स्त्री को कोई वातिक रोग, वातिक मूत्रग्रह हो अथवा शूल हो तो दूध के साथ एरण्ड पत्र का चूर्ण अथवा दूध में एरण्ड के पत्तों को पकाकर सेवन।
- पांचवें मास में गर्भिणी स्त्री को अम्ल एवं लवण द्रव्ययुक्त आस्थापन तथा मधुर द्रव्यों की अनुवासन (स्नेह) ब्रन्धि

- का प्रयोग ।
- छठे मास में गर्भिणी स्त्री की ग्रन्थिरोग, पिडका, शोथ तथा विशेषकर रोहिणी नामक विद्रधि की दारुण चिकित्सा करनी चाहिये ।
 - सातवें मास में गर्भिणी स्त्री के उभरे हुए मांस की शान्ति के लिए क्षारकर्म, अग्निकर्म, टूटी हुई हड्डी का जोड़ना इत्यादि सभी शस्त्रकर्म किये जा सकते हैं ।

गर्भिणी ज्वर

गर्भिणी ज्वर का महत्व

गर्भिणीनां ज्वरः कष्टः सर्वव्याधिषु पार्थिव ! ।
ज्वरोष्मणाऽभितप्तस्तु गर्भो यात्येव विक्रियाम् ॥
तस्माज्ज्वरचिकित्सां तु पूर्वमेव निबोध मे ।

(का.खि.स्था. 10/4-5)

हे पार्थिव ! गर्भिणी स्त्रियों के सम्पूर्ण रोगों में ज्वर सबसे अधिक कष्टदायी रोग होता है । ज्वर की ऊष्मा (गर्मी) से सन्तप्त हुए गर्भ में विकृति उत्पन्न हो जाती है । इसलिये सबसे पहले तुम मुझसे ज्वर की चिकित्सा सुनो ।

निदान

क्षुच्छ्रमाभ्यञ्जनाद्रौक्ष्यादौष्ण्यापक्वविधारणात् ॥
स्नेहस्वेदौषधानां च विभ्रमात्तेजसोऽपि च ।
सन्तापान्मनसश्चापि पर्वतानां तथैव च ॥
गन्धाच्च तृणपुष्पाणां गर्भिण्या जायते ज्वरः ।

(का.खि.स्था. 10/5-6)

क्षुधा, श्रम, अभ्यञ्जन, रुक्षता, उष्णता, अपक्व के धारण, स्नेहन, स्वेदन तथा औषधियों और तेज के विभ्रम, मन के सन्ताप तथा पहाड़ों पर चढ़ने और तृण एवं पुष्पों की गन्ध इत्यादि से गर्भिणी स्त्री को ज्वर हो जाता है ।

भेद

ज्वर के भेदों का नामतः वर्णन नहीं आया है परन्तु आचार्य काश्यप ने वातज, पित्तज, कफज, वातपित्तज, वातकफज, पित्तकफज, (मद्यपा) स्त्री के ज्वर का वर्णन किया है ।

चिकित्सा सिद्धान्त

चतुर्थ मास के पूर्व चिकित्सा सिद्धान्त

गर्भिणीं ज्वरितां नारीमेकाहमुपवासयेत् ॥
ततो दद्यादलवणां पेयां स्नेहविवर्जिताम् ।
तीक्ष्णानि त्वन्नपानानि स्वेदमायासमेव च ॥

वर्जयेज्ज्वरिता नारी यवागूं केवलां पिबेत् ।
 यवाग्वा हसिते दोषे यूपैरन्नानि दापयेत् ॥
 यूपैस्तु हसिते दोषे रसं वा क्षीरमेव वा ।
 दापयेन्मतिमान् प्राज्ञो न त्वौषधविधिर्हितः ॥

(का.खि.स्था. 10/7-10)

- पहले एक दिन उपवास कराके फिर लवण एवं स्नेह से रहित पेया देनी चाहिए ।
- तीक्ष्ण अन्नपान, स्वेदन और आयास (परिश्रम वाले कार्य) का त्याग कर देना चाहिए ।
- केवल यवागू का सेवन करना चाहिए ।
- यवागू के द्वारा दोषों के कुछ कम हो जाने पर यूपों के साथ अन्न का सेवन कराये ।
- यूपों के द्वारा दोषों के और कम हो जाने पर मांसरस अथवा दूध देना चाहिए ।
- इस अवस्था में औषधियों का प्रयोग वर्जित है ।

चतुर्थमास के पश्चात् चिकित्सा सिद्धान्त

अनुबन्धे तु दोषस्य गर्भकालमपेक्ष्य च ।
 मासाच्चतुर्थात् प्रभृति भिषग्भेषजमाचरेत् ॥
 शारीरं तु ज्वरं ज्ञात्वा वातपित्तकफात्मकम् ।
 मध्यां क्रियां प्रयुञ्जीत संचिन्त्य गुरुलाघवम् ॥
 उपद्रवबलं ज्ञात्वा सत्त्वं चापि समीक्ष्य तु ।
 गर्भावस्थां तु विज्ञाय लेखनानि प्रदापयेत् ॥

(का.खि.स्था. 10/11-13)

- चतुर्थ मास के बाद चिकित्सक औषधि का प्रयोग कर सकता है ।
- चतुर्थ मास से पूर्व गर्भ स्थिर नहीं होता इस लिये औषधियों का प्रयोग नहीं कराना चाहिए । चतुर्थ मास में गर्भ स्थिर हो जाता है । गर्भ के स्थिर हो जाने के बाद विशेष डर (गर्भस्त्राव का) नहीं रहता है ।
- गुरुता एवं लघुता का विचार करके मध्य क्रिया (चिकित्सा) का प्रयोग करना चाहिए ।
- जो साधारणतया तीनों दोषों के प्रकोप में व्यवहृत हो ऐसी चिकित्सा करनी चाहिए ।
- रोग के उपद्रव एवं रोगी के बल और गर्भावस्था को ध्यान में रखते हुए लेखन औषधियों का प्रयोग करना चाहिए ।

ज्वर में तृष्णा होने पर चिकित्सा

- ज्वर में तृष्णा (प्यास) लगने पर हलका उष्ण (सुखोष्ण) जल पीना चाहिए ।
- विशेषकर वातिक और श्लैष्मिक ज्वर में तो शीतल जल विष के तुल्य है ।
- पैत्तिक ज्वर में भी गरम करके ठण्डा किया हुआ जल ही प्रशस्त माना गया है ।
- कृपी तथा पत्थर के बर्तन में पकाकर ठण्डा किया गया जल प्यास को बुझाता है ।

- ज्वर के वेग के समाप्त हो जाने पर प्रत्येक ज्वर के अनुसार तृष्णाशामक औषधियों के द्वारा पकाया हुआ शीतल या उष्ण जल देना चाहिए।

ज्वर में शिरोरोग होने पर चिकित्सा

- गर्भिणी स्त्री को यदि शिरोरोग हो जाय तो यथावत् चिकित्सा करनी चाहिए।
- ज्वर का वेग पूर्णरूप से शान्त हो जाने पर भी गुरु भोजन नहीं देना चाहिए।

तरुण ज्वर में पंचकर्म का निषेध एवं निषिद्ध के सेवन से उत्पन्न उपद्रव

तरुण ज्वर में निषेध	निषिद्ध के सेवन से उत्पन्न उपद्रव
अभ्यंग	• गर्भघात
स्वेदन	• तरुण गर्भ की च्युति • स्थिर गर्भ में वैवर्ण्य
वमन, विरेचन	• गर्भव्यापद, गर्भभ्रंश, दारुणरोग (चरक संहिता) • गर्भघात (काश्यप संहिता)
आस्थापन, अनुवासन	• गर्भव्यापद, गर्भभ्रंश, दारुणरोग (चरक संहिता) • हीनाङ्ग, गर्भस्त्राव (काश्यप संहिता)
नस्य	• हीनाङ्ग, अरोचक, गर्भिणी के प्राण की हानि
धूमपान	• कुणि, अन्ध, दुर्बलेन्द्रिय, विवर्ण, गर्भपात
शिरोविरेचन	• गर्भ का स्तम्भन, काण, कुणि, पक्षहत, पीठसर्पी (चरक संहिता) • भक्तद्वेष, ज्वर, मूर्च्छा, अर्धाविभेदक, व्यङ्ग, विकलेन्द्रिय, उन्माद, अपस्मार (अष्टांगसंग्रह) • गर्भघात, वातरोगी (काश्यप संहिता)

नस्य से उत्पन्न उपद्रव की चिकित्सा

- पुष्पाध्याय या यूषाध्याय की औषधियों का प्रयोग।
- जीवनीय द्रव्य से सिद्ध दूध का प्रयोग।

शिरोविरेचन से उत्पन्न उपद्रव की चिकित्सा

- वातहर विधि जैसे स्नेहन, स्वेदन, बृंहण इत्यादि का प्रयोग।
- घृत, क्षीर का प्रयोग।

वातज ज्वर की चिकित्सा

गर्भिणी स्त्री के वातज ज्वर में निम्न औषधियों का प्रयोग करना चाहिए—

- वातज्वरहर क्वाथ—विदारीगन्धा, कलशी (पृश्निपर्णी), एरण्ड, मुलेठी तथा देवदारु के क्वाथ में शर्करा और बिजौरै नीबू का रस मिलाकर पान।

- विदारीगन्धा वर्ग की औषधियों के ईषद् उष्ण क्वाथ में देवदारु मिलाकर पान ।
- एरण्ड, वरुण, दोनों बृहती, मुलेठी तथा रास्ना का कल्क एवं क्वाथ का सेवन ।
- दोनों पञ्चमूल अर्थात् दशमूल के क्वाथ में रास्नाकल्क मिलाकर ईषदुष्ण अथवा शीतल अवस्था में सेवन ।
- भोजन के जीर्ण होने पर पतली तथा लवण रहित पेया का पान ।
- अभ्यङ्गार्थ तैल— उष्ण तैल के द्वारा सम्पूर्ण शरीर का अभ्यङ्ग करें । तीन दिन मालिश करने से यह वातज्वर को नष्ट कर देता है । स्थिर हुए गर्भ में (अर्थात् चतुर्थ मास के बाद) इस अभ्यङ्ग (तैल) का यथावत् प्रयोग प्रशस्त माना गया है ।
- जीर्णज्वर में गर्भवती स्त्री को सदा वातनाशक औषधियों से सिद्ध किया दूध, क्षीरयवागू अथवा जांगल मांसरस का प्रयोग करना चाहिए ।

पित्तज्वर की चिकित्सा

- सारिवा आदि के क्वाथ में शर्करा और मधु मिलाकर प्रातःकाल पान ।
- पयस्या, क्षीरकाकोली, मुनक्का, मुलेठी, शर्करा तथा मधु मिला हुआ पानक सेवन ।
- नीलकमल, पयस्या, सारिवा, मुलेठी, मधु, पिप्पली, मरिच, खस, लोध्र, लाजा तथा चीनी को दूध में मिलाकर खूब मथकर पान ।
- नल, बेंत तथा गुन्द्रा के मूल, सहा, सहदेवा, मकोय, पाटला, क्षीरी वृक्षों तथा आम्र और जामुन के नवीन पत्ते, कमल, सारिवा, खस, चन्दन तथा पद्मपत्रक को बारीक पीसकर घी मिलाकर बनाया हुआ प्रदेह (प्रलेप) का प्रयोग ।
- पिसे हुए जौ 1 कुडव, मंजीष्ठ आधा पल, अम्ल (कांजी) 100 प्रस्थ, तिल तैल 1 प्रस्थ को तैलपाक विधि से सिद्ध करें । यह तैल दाह तथा ज्वर को नष्ट करता है ।
- शीतल पेया अथवा दूध पथ्य होता है ।
- जीर्ण पित्त ज्वर में पित्तनाशक औषधियों द्वारा पकाया हुआ चने का यूष पथ्य माना गया है ।

श्लेष्मज्वर की चिकित्सा

- रास्ना का क्वाथ ठण्डा करके उसमें मधु मिलाकर पान ।
- रास्ना तथा मधु मिश्रित देवदारु के क्वाथ का पान ।
- पिप्पली एवं मधु मिश्रित चन्दन के क्वाथ का पान ।
- रास्ना, वासा और गिलोय क्वाथ का पान ।
- सुखोष्ण पेया, मूंग का यूष अथवा मूली का रस प्रयोग ।
- शरीर के लिए सात्म्य वस्तुओं का प्रयोग ।

श्लेष्म-पित्तज्वर की चिकित्सा

- श्रीपर्णिका, अमृता तथा मधुयष्टि के क्वाथ में मधु मिलाकर सेवन ।



श्लेष्म-वातज ज्वर की चिकित्सा

- बृहत् पञ्चमूल के क्वाथ में रास्ना का कल्क मिलाकर प्रातःकाल सेवन ।

वात-पित्तज ज्वर की चिकित्सा

- विदारीगन्धादि गण की औषधियों के क्वाथ में शर्करा तथा मधु मिलाकर पान ।

सन्निपातज ज्वर की चिकित्सा

- बल के अनुसार औषधियों का प्रयोग ।
- त्रिदोषशामक चिकित्सा का प्रयोग ।

मद्यपा स्त्री के ज्वर की चिकित्सा

- मद्य में आधा पानी मिलाकर पान ।
- भिन्न-भिन्न कल्पों को सुरा के द्वारा सुगन्धित करके पान ।
- हरेणु, मूंग तथा चुच्चू नामक शाक अथवा काकड़ाशृङ्गी के रस या कुछ अम्ल रस के साथ लवण तथा स्नेह से रहित मृदु एवं सुगन्धियुक्त भोजन का सेवन ।

विषम ज्वर की चिकित्सा

- शुण्ठी को बकरी के दूध में पीसकर पान ।

गर्भिणी अरुचि की चिकित्सा

- शृंगबेर, कटुक एवं मातुलुङ्ग केशर का दन्त एवं जिह्वा पर मर्दन ।
- उष्ण जल का गण्डूष धारण ।

गर्भिणी छर्दि का चिकित्सा

- अनुकूल उपचार ।
- आकांक्षित वस्तु का सेवन ।
- भूनिम्बकल्क एवं शर्करा का समान मात्रा में सेवन ।
- वातिक छर्दि में बिजौरै नींबू का रस, लाजा, कोल मज्जा, रसाञ्जन, अनारदाना, चीनी एवं मधु के साथ बना हुआ अवलेह का प्रयोग । हृद्य तथा लवणरहित खट्टेअनार का रस तथा पका हुआ मांसरस अथवा अच्छी प्रकार संस्कार किया हुआ भैंस का मांसरस का सेवन ।
- पैत्तिक छर्दि में चातुर्जातिक के कल्क में लाजा का चूर्ण, शर्करा तथा मधु मिलाकर तथा उसे फूलों के द्वारा हल एवं सुगन्धित करके तण्डुलोदक के साथ सेवन अथवा शर्करा एवं मधु मिश्रित लाजा की पेया का प्रयोग अथवा जांगल पशुपक्षियों के मांसरस का शर्करा के साथ प्रयोग ।
- श्लैष्मिक छर्दि में आम एवं जामुन के शुभ्र कोमल पत्तों को पकाकर उसमें मधु मिलाकर पान तथा भोजन में अनारदने से सिद्ध किया हुआ स्नेह और लवणयुक्त मूंग का यूष सेवन ।

- सत्रिपातज वमन में संसृष्ट योग देने चाहिए ।
- कृमिजन्य वमन में पुनर्नवा मूल तथा देवदारु के क्वाथ में मधु मिलाकर पान ।

गर्भिणी हल्लास की चिकित्सा

- भूमिम्ब कल्क का मधु के साथ सेवन ।

गर्भिणी विबन्ध एवं विद्रधी की चिकित्सा

- हरीतकी, नागर तथा गुड़ का त्रिफला क्वाथ के साथ सेवन ।

गर्भिणी उदावर्त की चिकित्सा

उदावर्तो ह्युपेक्षितः सहसा सगर्भा गर्भिणीं गर्भमथवाऽतिपातयेत् ।

(च.सं.शा. 8/29)

उदावर्त की उपेक्षा करने पर गर्भाशय में उदावर्त के कारण वायु बढ़कर सहसा गर्भ के साथ गर्भिणी को अथवा केवल गर्भ को मार डालता है । अतः उदावर्त की चिकित्सा शीघ्र करनी चाहिए जो निम्न प्रकार से वर्णित है—

- आठवें मांस में उदावर्त सम्बन्धी विबन्ध हो जाय और वह विबन्ध अनुवासन देने पर न ठीक हो सके तो उसे अनुवासन असाध्य समझ कर उस गर्भिणी के लिए तत्काल उपद्रवों को शान्त करने वाली औषधियों (वीरण, शालि, षष्टिक, कुश, कास, इत्यादि) से निरूह वस्ति की कल्पना करके वस्ति दें जिससे मलबन्ध शीघ्र नष्ट हो जाए ।
- निरूह प्रयोग से विबन्ध दूर हो जाए तो ईषत् उष्ण जल से स्नान कराने के बाद गर्भ को स्थिर करने वाले अविदाही (शीतल) आहार का सेवन कराना चाहिए ।
- उसी दिन सायंकाल में मुलेठी से सिद्ध किए हुए तैल का अनुवासन बस्ति देना चाहिए ।
- गर्भिणी को अनुवासनबस्ति या निरूहबस्ति, न्युब्ज स्थिति (नीचे मुख शयन कराकर) में देना चाहिए ।

गर्भिणी अतिसार

गर्भिणी स्त्री को अतिसार हो जाने पर वातिक, पैत्तिक एवं श्लैष्मिक दोष के अनुसार यथोक्त चिकित्सा करनी चाहिये ।

निदान

विरुद्ध भोजन, अध्यशन (पूर्वकृत आहार के बिना पचे दूसरा भोजन करना), अजीर्ण, मात्रा से अधिक भोजन, भय तथा उद्वेग के विघात, दोषों के संघात, सन्तर्पण एवं क्षय तथा कच्चे कन्द मूल, फल के प्रयोग एवं दूषित जल के सेवन, क्षुधा के कारण उत्पन्न रूक्षता, शोक, गुरु एवं अभिष्यन्दि भोजन से अब धातु (जलीय अंशयुक्त धातु) के उद्वेग के कारण अतिसार हो जाता है ।

चिकित्सा सिद्धान्त

आमातिसारे
पक्वसंग्रहणे

सञ्जाते
पथ्यः

पाचनानि
सर्वेषामिति

प्रदापयेत् ।
निश्चितः ॥

(का.सं.खि. 10/70,75)

- आमातिसार में पाचन औषधियों का प्रयोग।
- पक्वातिसार में सग्राही (स्ताम्भक) औषधियों का प्रयोग।

आमातिसार की चिकित्सा

- आम के श्लेष्मा से युक्त होने पर इन्द्रजौ, नागरमोथा, पाठा, अजमोदा, सरल (चीड़) तथा अतिविषा आदि पाचक औषधियों को पीसकर ईषदुष्ण जल के साथ सेवन।
- आम के पित्त से युक्त होने पर पाठा, चन्दन, इन्द्रजौ तथा अतीस आदि औषधियों को पीसकर जल के साथ सेवन।
- आम के वात से युक्त होने पर हींग, सैन्धव, नागकेसर, दोनों बृहती, इन्द्रजौ, पिप्पलीमूल तथा अतीस को पीसकर ईषदुष्ण जल के साथ सेवन।
- सात्रिपातिक आमातिसार में बृहत्यादि गण की औषधियों का क्वाथ पिलाना चाहिये।

पक्वातिसार की चिकित्सा

- पक्वातिसार में श्लेष्मा का संयोग होने पर स्तम्भन के लिये अम्बुष्ठादि गण के क्वाथ में मधु तथा तण्डुलोदक मिलाकर पान।

वातातिसार की चिकित्सा

- एरण्ड को छोड़कर स्वल्प पञ्चमूल का क्वाथ बनाकर उसमें काला और कट्वङ्ग मिलाकर पान।
- कमल, मंजिष्ठा, आम की गुठली, बृहती, कच्चे बिल्व के गुदा को बारीक पीसकर दही के साथ सेवन।
- पिप्पली, धाय के फूल, कमल, मंजीठ, मोचरस, मत्स्यण्डिका, इन्द्रजौ को पीसकर तण्डुलोदक के साथ सेवन।
- नागरमोथा, बिल्वशलाटु, सारिवा, मुलेठी को बारीक पीसकर उसमें घृत तथा गुड मिलाकर यथावत् दही के साथ सेवन।

पित्तातिसार की चिकित्सा

- न्यग्रोधादि गण के क्वाथ में मधु मिलाकर सेवन।
- पिप्पली, धाय के फूल, मुलेठी, कच्चे बिल्व के गुदा के क्वाथ में शर्करा एवं मधु मिलाकर पान।
- कमल, मंजीठ, आम की गुठली, मुलेठी, पद्मकेसर, लोध्र तथा मोचरस को शर्करा तथा मधु के साथ पान।

श्लेषमातिसार की चिकित्सा

- इन्द्रजौ, धाय के फूल, मरिच, लोध्र, कट्वङ्ग तथा देवदारु को मधु के साथ पीसकर तण्डुलोदक से पान।
- नलिन (कमल) के पुंकेसर को तण्डुलोदक में पीसकर मधु मिलाकर पान।

रक्तातिसार की चिकित्सा

- बाण मूल के क्वाथ में खीरा का बीज तथा शर्करा और मधु मिलाकर सेवन।
- कमल, मंजिष्ठा, मुलेठी, चन्दन, कमलकेसर के चूर्ण को मधु मिलाकर दूध से सेवन।

- काले तिल, मंजिष्ठा, मधुयष्टि तथा नील कमल पीसकर कच्चे दूध के साथ सेवन ।
- चरक ने रक्तातिसार में बकरी के दूध का प्रयोग बताया है ।
- मोचरस, तिल, लोध्र, नीलकमल, कमल के चूर्ण का दूध के साथ सेवन ।
- पयस्या, रक्तचन्दन, लोध्र तथा कमलकेसर के चूर्ण को मधु में मिलाकर दूध के साथ सेवन ।
- कल्याणकावलेह सभी प्रकार के अतिसारों को नष्ट करता है ।
- हीबेरादि क्वाथ का प्रयोग ।

गर्भिणी प्रवाहिका की चिकित्सा

- गंभारी मूलत्वक् का कल्क तथा त्रिवृत् मूल को दधिमण्ड के साथ यवागू बनाकर अल्प घृत के द्वारा सिद्ध करके निरन्तर पान ।
- विरायता, लोध्र, मुलेठी, फाणित (राब), तिल का कल्क, शर्करा तथा मधु का तण्डुलोदक के साथ सेवन ।
- खड्योग का प्रयोग ।

गर्भिणी ग्रहणी की चिकित्सा

- आम एवं जामुन के त्वक् का क्वाथ में लाजा सत्तू मिलाकर सेवन ।

गर्भिणी परिकर्तिका की चिकित्सा

- वातिक परिकर्तिका में बृहती, बिल्व तथा अनन्तमूल के यूष का सेवन ।
- पैतिक परिकर्तिका में मुलेठी, हंसपादी तथा धनिये के कल्क को मधु में मिलाकर तण्डुलोदक के साथ सेवन ।
- श्लैथिक परिकर्तिका में समान मात्रा में कटेरी, गोक्षुर तथा पीपल को पीसकर तथा उसमें नमक मिलाकर भोजन तथा पान के रूप में प्रयोग ।

गर्भिणी के गुद वेदना की चिकित्सा

- कुपी अथवा पत्थर के बर्तन में गरम किये हुए दूध के साथ मुलेठी का सेवन तदनन्तर घृतमण्ड के द्वारा अनुवासन वस्ति का प्रयोग ।

गर्भिणी किक्किस

परिभाषा

रेखास्वरूपस्त्वक्संकोचः किक्किसम् ॥ (इन्दु, अ.सं.शा. 3/9)

रेखा स्वरूप त्वक् के संकोच को किक्किस कहा जाता है ।

निदान सम्प्राप्ति

सातवें मास में गर्भ में केश उत्पन्न होते हैं अतः माता के शरीर में विदाह उत्पन्न होता है, ऐसा स्त्रियाँ कहती हैं परन्तु भगवान् आत्रेय का मत है कि ऐसी बात नहीं है । गर्भ के कारण उत्पीड़ित वात, पित्त एवं कफ उरोभाग में जाकर विदाह उत्पन्न करते हैं जिससे कण्डू की उत्पत्ति होती है एवं कण्डू से किक्किस की उत्पत्ति होती है ।

गर्भ के कारण वात, पित्त एवं कफ का उत्पीडन



दोषों का उरस् स्थान में गमन (वाग्भट द्वय-दोष हृदय आश्रित)



विदाह



कण्डू



किक्किस

लक्षण

- उरु, स्तन एवं उदर पर रेखा आकार की विशेष प्रकार की बलि की उत्पत्ति ।
- हाथ-पैर में सन्ताप (विदाह)।
- कण्डू।

चिकित्सा

बाह्यप्रयुक्त औषधियाँ

स्तन एवं उदर पर औषधियों से मर्दन—

- शिरीष, धातकी, सर्षप एवं मधुयष्टी का चूर्ण ।
- कुटज, अर्जक-बीज, मुस्ता एवं हरिद्रा का कल्क ।
- निम्ब, बदरी, सुरसा एवं मंजिष्ठा का कल्क ।
- पृषत् या एण हरिण एवं शशक के रक्त से मिश्रित त्रिफला कल्क ।
- करवीर एवं करञ्ज के पत्र के कल्क से साधित तैल से अभ्यंग ।

स्तन एवं उदर पर औषधि क्वाथ से सिंचन—

- पटोल, निम्ब, मंजिष्ठा एवं सुरसा का क्वाथ ।
- मालती तथा मधुक से सिद्ध जल ।
- दारुहरिद्रा एवं मधुक के क्वाथ से बार-बार मार्जन या प्रक्षालन ।

कण्डू होने पर भी त्वक्-भेद एवं वैरुष्य से बचाने के लिए कण्डू न करें एवं असह्य अवस्था में उपर्युक्त चूर्णों से मर्दन या घर्षण कर कण्डू का परिहार करें ।

आध्वन्तर प्रयुक्त औषधियाँ

- मधुरगण की औषधियों से साधित नवनीत को पाणितल मात्रा में कोलोदक के साथ समय-समय पर पान ।
- बदरी के क्वाथ एवं मधुरौषध से सिद्ध नवनीत का पान ।

पथ्य

- मधुर, वातहर, थोड़ा-थोड़ा अल्प स्नेह एवं लवण युक्त लघु आहार सेवन ।
- अनुपान में अल्प मात्रा में जल का प्रयोग ।
- स्नान एवं उद्वर्तन में चन्दन का प्रयोग ।

अपथ्य

- कण्डू करना (कण्डू करने से त्वक् भेद एवं वैरुष्य हो जाता है)।

गर्भिणी मुखपाक की चिकित्सा

- सर्वप्रथम हल्दी तथा दारुहल्दी क्वाथ का कवलधारण करें।
- तदनन्तर स्नेह के पश्चात् चीनी मिले पानी तथा अन्त में लोध्र क्वाथ का कवलधारण करें।
- उसके बाद लोध्र के चूर्ण का मुख में प्रतिसारण करें।
- अन्त में सारिवा, मंजिष्ठा, धृषी तथा मोचरस के चूर्ण को मधु में मिलाकर सेवन (अन्तःप्रयोग) करें।

गर्भिणी आक्षेपक तथा अपतानक की चिकित्सा

- मातुलुङ्ग के रस में विड्नमक तथा सैन्धव नमक मिलाकर सेवन ।
- अग्रिमन्थ क्वाथ या वरुण क्वाथ का पान ।
- बटेर या तीतर के स्नेहयुक्त मांसरस का सेवन ।
- चर्मचटी के रस का पान ।
- पित्त का संयोग होने पर मधुर जांगल मांसरस अथवा मधुर वर्ग की सम्पूर्ण औषधियों का क्वाथ बनाकर उसमें अनारदाना मिलाकर सेवन ।
- यदि वायु तथा कफ का संयोग हो तो अम्ल और कटु रसों का सेवन अथवा जांगल मांसरस में यवक्षार मिलाकर सेवन करना चाहिए । तथा हाथों को गरम करके रोगी को मृदु ताप देना लाभदायक होता है । जीर्णगर्भ में विशेषकर घृत से सेक करना चाहिए अथवा व्याधि के अनुसार उष्ण या शीत सेक का प्रयोग करना चाहिए ।

गर्भिणी कामला की चिकित्सा

- पिप्पली, अङ्कोठमूल, घोड़े की लीद का रस और भैंस के दूध का दही मिलाकर सेवन ।
- पृश्निपर्णी, बला तथा वासा का क्वाथ पान ।

गर्भिणी हृदय-शूल की चिकित्सा

- वातिक हृदयशूल में बिजौरै नीबू के रस में अच्छी प्रकार सैन्धव नमक मिलाकर सेवन ।

- पैतिक हृदयशूल में प्रियङ्गु, पिप्पली, भद्रमुस्ता, हरेणु, मधु तथा बेर के चूर्ण का प्रयोग ।
- श्लैष्मिक हृदयशूल में पिप्पली का चूर्ण, तेजपत्र, चोच तथा प्रियङ्गु को बिजौरै नींबू के रस में मिलाकर सेवन ।

गर्भिणी कास की चिकित्सा

- वातिक कास में काकड़ाशृङ्गी, शरट, भाङ्गी तथा पिप्पली के चूर्ण में बिजौरै नींबू का रस मिलाकर सेवन ।
- पैतिक कास में मुलेठी, गोक्षीरी, पिप्पली तथा शर्करा को मुनक्का तथा मधु के साथ सेवन ।
- श्लैष्मिक कास में पिप्पली, त्रिफला, रास्ना तथा भद्रदारु के चूर्ण को मधु के साथ सेवन ।
- क्षतज कास में मुलेठी, शंखपुष्पी, पीपल की लाख को मधु और चीनी के साथ मिलाकर सेवन ।

गर्भिणी श्वास-कास चिकित्सा

- मोर के रोंये तथा सेही और शल्यक् के बाल, पिप्पली, चावल तथा कोल की जड़ के चूर्ण का मधु और घृत के साथ सेवन ।
- गुड़, रास्ना, पिप्पली, द्राक्षा, मरिच, हल्दी, मंजीठ का चूर्ण तैल के साथ सेवन करने से श्वास, कास तथा तमक श्वास नष्ट होता है ।
- सम्पूर्ण श्वास तथा कास रोगों में हरड़, आंवला, शल्यक (छोटी सेही) की त्वचा, गृहधूम तथा ऊँट की हड्डियों को पीसकर दही तथा तेल के साथ सेवन । पिप्पली, आंवला, नागरमोथा, राब, शर्करा तथा हरड़ का चूर्ण तैल और मधु में मिलाकर सेवन ।

गर्भिणी ऊर्ध्ववात की चिकित्सा

- भद्रदारु, हरड़, सैन्धव नमक, कुष्ठ, घृत तथा फाणित (राब) को मिलाकर बनाया हुआ अवलेह का सेवन ।

गर्भिणी पार्श्वग्रह की चिकित्सा

- शालपर्णी, पृश्निपर्णी, बृहती, कटेरी, बिल्व, अग्निमन्थ, श्योनाक, गंभारी तथा पाटला का अच्छी प्रकार से यूष बनाकर भोजन तथा पान के रूप में प्रयोग ।

गर्भिणी शोफ की चिकित्सा

- केवल पुनर्नवा के क्वाथ का पान ।
- पृश्नीपर्णी, बला तथा वासा का क्वाथ पान ।
- उष्णजल से स्वेदन ।
- दारुण विरेचन का प्रयोग नहीं करना चाहिए ।

गर्भिणी हिक्का की चिकित्सा

- पिप्पली, गेरु, भाङ्गी, हींग तथा काकड़ाशृङ्गी को समान मात्रा में लेकर बनाया हुआ अवलेह का प्रयोग ।

गर्भिणी मूत्रग्रह की चिकित्सा

- शतावरी, दर्भमूल, मुलेठी, क्षीरमोरट (मूर्वाभेद-क्षीरचूरीनि या क्षीरमोरबेल), पाषाणभेद, खस तथा निर्मली बीजों का क्वाथ, कल्क अथवा इनसे सिद्ध दूध का पान ।

गर्भिणी गुल्म की चिकित्सा

चतुर्थ मास में गर्भिणी स्त्री के वातिक, पैत्तिक तथा श्लैष्मिक गुल्म की निम्न चिकित्सा करनी चाहिए :—
गर्भवती स्त्रियों में चतुर्थ मास से पूर्व औषधि नहीं देनी चाहिए क्योंकि तब तक गर्भ स्थिर नहीं होता है। चतुर्थ मास में गर्भ स्थिर हो जाता है। इसीलिये चतुर्थ मास से पूर्व इसकी चिकित्सा का विधान न देकर उसके बाद के मासों में क्रमशः चिकित्सा का क्रम दिया गया है।

- मदनफल से युक्त घृत, अन्नपान, दूध अथवा इक्षुरस के द्वारा यथावत् वमन ।
- अमलतास के रस से सिद्ध किये हुए मांसरस अथवा दूध के द्वारा गर्भिणी स्त्री का विरेचन । अथवा पूतिकरञ्ज के तले हुए पत्तों अथवा पीत बला के फूलों से बनी हुई यवागू को अनारदाने से अम्ल करके पान कराना चाहिए, जिससे विरेचन का बहुत अधिक योग न हो।

गर्भिणी रक्तपित्त की चिकित्सा

- पृश्निपर्णी, बला तथा वासा क्वाथ पान।

गर्भिणी स्त्री के सर्पदंश अथवा विषपान की चिकित्सा

- विषनाशक वामक औषधियों के द्वारा वमन कराकर संसर्जन क्रम से चिकित्सा करनी चाहिए ।
- पाठा, गिलोय, सोमवल्क (श्वेत खदिर), दोनों सहा (सहा तथा अतिसहा) तथा कुटज में दूध डालकर उसका क्षीरपाक करके पान ।
- शिरीष, पाटलामूल, चौलाई, निर्गुण्डी तथा सहचर की जड़ का क्वाथ या पतली पेया बनाकर पान ।
- खडयूष का प्रयोग तथा युक्तिपूर्वक अन्न का सेवन ।
- अन्य विष नाशक चिकित्सा का प्रयोग ।

गर्भ को नष्ट करने वाले गर्भिणी के लक्षण

- जो गर्भवती स्त्री दुर्बल तथा एकदम सफेद (पाण्डु वर्ण वाली) हो जाती है तथा उसे ज्वर होने लगे ।
- जो गर्भिणी स्त्री बहुत खाती हो, बार-बार खाती हो तथा खाते-खाते बार-बार मूर्च्छित हो जाती हो ।
- जिस गर्भिणी स्त्री के नेत्र मोथे के समान उभरे हुए हों, कान तथा पैर ठण्डे पड़े गये हों तथा बाल जटिल (वव्रः) हों ।
- जो गर्भ स्त्री के पेट में नाभि के ऊपर दोनों पार्श्वों में अथवा मध्य में स्थित होता है।
- जिस स्त्री के सन्धिबन्धनों में पीडा होती हो तथा अन्न में अरुचि हो एवं चेष्टा से शून्य तथा अधिक रोने की इच्छा वाली स्त्री का गर्भ नष्ट हो जाता है ।

उत्पन्न होने वाले पुत्र को नष्ट करने वाले गर्भिणी के लक्षण

- जिस स्त्री के सन्धियों में शोथ हो जाये, अङ्गों में पाक हो जाये तथा पदन्यास भारी हो जाये ।
- जो स्त्री गर्भावस्था में बहुत शोक, दुःख तथा चिन्ता करती हो और जो अङ्गुलियों को चटकाती रहती हो ।
- जिसका दूध दुर्गन्धयुक्त हो तथा जिसके बाल जटिल और मैले हो ।
- जिसके मुख से दुर्गन्ध आती हो, जिसके पेट में शूल हो तथा जिसे सदा नींद आती रहती हो, उसका उत्पन्न हुआ पुत्र जीवित नहीं रहता ।

गर्भिणी को नष्ट करने वाले लक्षण

- जो गर्भिणी स्त्री अग्नि को मोर की गर्दन के समान नीली देखती है ।
- जिसके पैर और मुख सूजे हुए हों ।
- जिस गर्भिणी स्त्री को पार्श्वशूल, तृष्णा, संज्ञानाश, श्वास तथा मार्गो (रसवाही अथवा अन्नमार्ग) का अवरोध हो ।
- जिस गर्भिणी स्त्री को कटिग्रह, योनिशूल, मुख से दुर्गन्ध आना, संज्ञानाश तथा प्रलाप हो ।
- जिस गर्भवती स्त्री की नाक कौए की तरह हो, जिसके नेत्र कांपते हो ।
- जिस गर्भवती स्त्री से बकरी अथवा घोड़े की गन्ध आती हो, जो सफेद (पाण्डु) हो गई हो, जो मोर का मांस खाना चाहती हो ।
- जो गर्भिणी स्त्री लाल वस्त्रों को धारण करती हो, लाल मालायें पहनती हो, सोते हुए जो मुस्कराती हो अथवा श्मशान की ओर जाती हो ।
- जो गर्भवती स्त्री स्वप्न में गदहे, सूअर, भैंस, कुत्ते अथवा ऊंट की सवारी करती हो, वह नष्ट हो जाती है ।

जातहारिणी या रेवती

आचार्य काश्यप ने रेवती कल्पाध्याय में रेवती या जातहारिणी का विस्तृत वर्णन किया है।

अथो स दीर्घजिह्वै रेवतीमेव प्राहिणोत् । सा शालावृकी भूत्वाऽसुर-सेनामभ्यवर्तत । अथो दीर्घजिह्वीमेवाग्रेऽभक्षयत् । तस्यास्तु धर्मैव निवृत्तिकारणमुक्तमिति ॥ (का.कल्प.स्था. 6/7)

कार्तिकेय ने दीर्घजिह्वी नामक असुर कन्या (जो देवताओं का संहार कर रही थी) के लिये रेवती को भेजा । रेवती ने शालावृकी होकर (गीदड़ या वनविलाव का रूप धारण करके) असुरों की सेना का संहार प्रारम्भ किया तथा सबसे पहले वह दीर्घजिह्वी का ही भक्षण कर गई । उसे मारकर उसने शकुनि बनकर उल्का, विद्युत् (बिजली), पत्थरों की वर्षा करने वाली तथा सम्पूर्ण प्रहरणों (आयुधों) की वर्षा करने वाली-इत्यादि अनेक रूपों वाली होकर असुरों को पराजित किया । इस प्रकार अनेक रूपों वाली शकुनि द्वारा संहार किये जाते हुए वे असुर मनुष्यों तथा अन्य प्राणियों के गर्भों को प्राप्त हुए अर्थात् उनके गर्भों में स्थित हो गये । रेवती ने मनुष्यों तथा अन्य प्राणियों के गर्भों में उन्हें देख लिया तब उसने जातहारिणी (उत्पन्न हुए प्राणियों का संहार करने वाली) बनकर उनका संहार किया । इस प्रकार वह जातहारिणी पुष्प (आर्तव रूप में विद्यमान गर्भ), वपु (शरीर-पिण्ड), गर्भ, उत्पन्न हुए, उत्पन्न होने वाले तथा उत्पन्न किये जाने वाले-

प्राणी को नष्ट करती है। विशेषरूप से वह असुरों, अधार्मिक व्यक्तियों के पुत्रों तथा अधर्म युक्त प्राणियों को नष्ट करती है। हे वृद्धजीवक ! इस प्रकार यह अनेक रूपों वाली तथा जातहारिणी (उत्पन्न हुए प्राणियों का हरण करने वाली) रेवती- "पिलिपिच्छिका, रौद्री तथा वारुणी" आदि नामों से कहलाती है। यह रेवती स्कन्द की आज्ञा से सम्पूर्ण जातियों में उत्पन्न हुए अधार्मिक व्यक्तियों को मूढकर देती है तथा दुष्टों का विच्छेद (नाश) करती है।

रेवती द्वारा आक्रान्त होने का कारण

गर्भिणी स्त्री अथवा उसके पति के द्वारा अहितकर आहर-विहार एवं अधार्मिक कर्म करने पर विभिन्न रूपों में जातहारिणी आक्रमण कर देती है। रेवती के आक्रान्त करने का मुख्य कारण अधर्म ही होता है।

क्रुद्ध हुई जातहारिणी का स्त्री में प्रविष्ट होने की अवस्था, काल एवं कर्म

रजस्वलां गर्भिणीं वा प्रसूतां वा कुटीगताम् ।
स्त्रियमाविशते क्रुद्धा त्रिषु कालेषु रेवती ॥
न चाधर्ममृते नारीं विशते जातहारिणी ।
मातुः पितुः सुतानां च साऽधर्मेण प्रवर्तते ॥
..... मातृणां च प्रजाक्षयम् ।
आयुः क्षयं च बालानां करोत्येषा स्वकर्मजम् ॥

(का.कल्प.स्था. 6/65-67)

क्रुद्ध हुई रेवती तीनों कालों में रजस्वला, गर्भिणी, प्रसूता तथा कुटी में स्थित अर्थात् कुटीप्रावेशिक नामक रसायन का प्रयोग करनेवाली स्त्री में प्रवेश करती है। यह जातहारिणी माता, पिता अथवा पुत्रों के अधर्म के बिना स्त्री में प्रविष्ट नहीं होती है। इसकी प्रवृत्ति का कारण अधर्म ही है। यह अपने कर्मों के कारण माताओं की सन्तान का तथा बालकों की आयु का नाश करती है।

रेवती द्वारा आक्रान्त होने पर स्त्री के लक्षण

प्रम्लायतस्तनोस्तस्या रूपाणीमानि, हीयते ॥
दृष्टिव्याकुलतां याति यथाकालं न पुष्यति ।
भ्रष्टसत्त्वा निरुत्साहा कुक्षिशूलनिपीडिता ॥
.....कुलक्षयं वा कुरुते प्रसक्ता जातहारिणी ।

(का.कल्प.स्था. 6/25-29)

जातहारिणी के द्वारा उसके शरीर के म्लान होने पर निम्न लक्षण होते हैं—उसकी दृष्टि कमजोर हो जाती है, व्याकुलता रहती है, ठीक समय पर पोषण नहीं होता, उसका मन पतित हो जाता है, कार्य में उत्साह नहीं होता है, तथा वह कुक्षिशूल से पीडित रहती है। उसका रूप (आकृति) अप्रिय हो जाता है तथा अनेक प्रकार के रोगों से व्याप्त हो जाती है। उसके सब कार्यों के प्रारम्भ विपरीत होते हैं तथा वह विपरीत ही आचरण करती है। वह उच्छिष्ट, विकृत तथा धृष्ट होती है। सम्पूर्ण विषयों में वह प्रवृत्त हो जाती है। उसे अर्थ (धन) की प्राप्ति नहीं होती तथा उसकी सम्पत्ति (प्रशस्त गुण) लुप्त हो जाती है। इसकी गौ, बकरी, भेड़ तथा भैंस आदि के बच्चे जीवित नहीं रहते। उसे भयंकर

अपयश प्राप्त होता है, वह विधवा हो जाती है तथा प्रसक्त हुई जातहारिणी उसके कुल का क्षय (नाश) कर देती है।

जातहारिणी से आक्रान्त शिशु के लक्षण

सद्यो रूपं तु तत्रैकं यदुच्चैस्त्रस्तवा शितम् ॥

मृदुनाऽपि च रोगेण पीडामाप्नोति दारुणाम् ।
अभीक्षणं त्रसते सुप्तो न शर्म लभते सुखात् ॥

(का.कल्प.स्था. 6/72-78)

शिशु भय सहित उच्चस्वर से रोता है। तथा उसके बाद स्तन्य (दूध) का दूषित होना, ज्वर, तन्द्रा, प्रमीलक (मूढता), शिरोभिताप, विवर्णता, अत्यन्त पाण्डु एवं पीलापन, तृष्णा, अतिसार, विकृतस्वर, तालुशोष, प्रहर्ष, मुखपाक, मुखस्फोट, विसर्प, पाण्डु, कामला आदि हो जाते हैं तथा बालक बहुत अधिक जागता रहता है, रोता है, उसे बार-बार अत्यन्त पीड़ा होती है। उसे श्वास तथा कास रोग हो जाते हैं। वह छींकता है तथा क्षणभर में ठण्डा पड़ जाता है। वह निश्चेष्ट एवं मृततुल्य हो जाता है तथा कुछ देर बाद उसे संज्ञा प्राप्त होती है। उसका ठीक समय पर पोषण नहीं होता तथा वह दूध से प्रसन्न नहीं होता। वह बालक जब किसी अपरिचित व्यक्ति को देखता है तो अत्यधिक डर जाता है। विडाल (बिलाव), नेवले तथा चूहों के शब्दों को सुनकर वह शीघ्र ही रोने लगता है। बहुत स्वल्प रोग से भी उसे भयंकर पीड़ा होती है। वह निरन्तर डरता रहता है तथा सोने पर उसे सुख (आराम) नहीं मिलता।

अधर्म की वृद्धि के कारण रेवती स्त्री के सन्तानों की अथवा स्त्री की अथवा दोनों की हत्या करती है।

रूपाण्येतानि संलक्ष्य भेषजं न पृणोति यः ।
सोऽपत्यैः कुरुते कार्यं स्वप्रलब्धैर्धनैरिव ॥

(का.कल्प.स्था. 6/79)

जो उपर्युक्त लक्षणों को देखकर इनकी चिकित्सा नहीं कराता, उसकी सन्तान उसी प्रकार नष्ट हो जाती है जिस प्रकार स्वप्न में प्राप्त हुए धन नष्ट हो जाते हैं।

भेद

शास्त्रों के अनुसार ऋषियों ने तीन प्रकार की जातहारिणियाँ कही हैं—

1. साध्य
2. याप्य
3. असाध्य

जीवित माताओं में दस साध्य जातहारिणियाँ कही गई हैं अर्थात् इनमें माताओं की मृत्यु नहीं होती। इनमें पुत्र (आर्तव) को नष्ट करने वाली असाध्य होती है तथा गर्भ को नष्ट करने वाली साध्य होती है।

धर्म-कर्म से युक्त स्त्रियों में नाम एवं कर्म के अनुसार 16 प्रकार की दारुण याप्य जातहारिणियों का निर्देश किया गया है। आठ असाध्य जातहारिणियों का निर्देश किया गया है।

लोक भेद से पुनः तीन प्रकार की ही जातहारिणियाँ कही गई हैं—

1. देवी

2. मानुषी

• वर्णा (ब्राह्मण, क्षत्रिय, वैश्य तथा शूद्र वर्ण वाली)

• वर्णान्तरा (वर्ण संकर से उत्पन्न हुई)

• लिङ्गिनी

• कारुकी

3. तिरश्चीना (पशु-पक्षिसंबन्धी)

• शकुनी

• चतुष्पदी

• सर्पा

• मत्सी

• वनस्पति

साध्य जातहारिणी के भेद एवं लक्षण

1. शुष्क रेवती—

आषोडशवर्षप्राप्ता या स्त्री पुष्यं न पश्यति ॥

प्रम्लानबाहुरकुचा तामाहुः शुष्करेवतीम् ॥

(का.कल्प.स्था. 6/31-32)

सोलह वर्ष की अवस्था तक भी जिस स्त्री को रजोदर्शन नहीं होता तथा जिसके बाहु एवं कुच (नितम्ब) पतले होते हैं उसे शुष्क रेवती कहते हैं ।

2. कटम्भरा—

विना पुष्यं तु या नारी यथाकालं प्रणश्यति ॥

कृशा हीनबला क्रुद्धा साऽपि चोक्ता कटम्भरा ॥

(का.कल्प.स्था. 6/32-33)

बिना रजोदर्शन के ही जो स्त्री उचित काल में नष्ट हो जाती है, जो कृश, हीनबल वाली एवं क्रुद्ध होती है उसे कटम्भरा कहते हैं ।

3. पुष्यघ्नी—

वृथा पुष्यं तु या नारी यथाकालं प्रपश्यति ॥

स्थूललोमशागण्डा वा पुष्यघ्नी साऽपि रेवती ॥

(का.कल्प.स्था. 6/33-34)

जिस स्त्री को यथासमय रजोदर्शन होता है परन्तु वह व्यर्थ (बिना फल वाला) होता है। जिसके गण्डस्थल (कपोल) स्थूल एवं लोम युक्त होते हैं उस रेवती को पुष्यघ्नी कहते हैं।

4. विकुटा—

कालवर्णप्रमाणैर्या विषमं पुष्पमृच्छति ॥
अनिमित्तबलगतानिविकुटा नाम सा स्मृता ॥
(का.कल्प.स्था. 6/34-35)

जिस स्त्री का पुष्प (ऋतुस्वाव) काल, वर्ण एवं प्रमाण से विषम हो अर्थात् विषम काल में, विषम वर्ण वाला तथा प्रारंभ में भी विषम हो। बिना कारण के ही जिसे बल की ग्लानि हो जाती हो उसे विकुटा कहते हैं।

5. परिस्त्रुता—

अभीक्षणं स्रवते यस्या नार्या योनिः कृशात्मनः ॥
परिस्त्रुतेति सा ज्ञेया नारीणां जातहारिणी ॥
(का.कल्प.स्था. 6/35-36)

जिस कृश स्त्री की योनि से निरन्तर स्राव बहता रहता है, उस जातहारिणी को परिस्त्रुता कहते हैं।

6. अण्डघ्नी—

यस्यास्त्वालक्ष्यमालग्रमण्डं प्रपतति स्त्रियाः ॥
अण्डघ्नीमिति ह्याहुस्तां दारुणां जातहारिणीम् ॥
(का.कल्प.स्था. 6/36-37)

जिस स्त्री का लक्ष्ययुक्त तथा चिपका हुआ अण्ड (गर्भ) गिर जाता है—उस दारुण (भयंकर) जातहारिणी को अण्डघ्नी कहते हैं।

7. दुर्धरा—

नातिनिर्वृत्तदेहाङ्गो यस्या गर्भो विनश्यति ॥
दुर्धरा नाम सा ज्ञेया सुधोरा जातहारिणी ॥
(का.कल्प.स्था. 6/37-38)

जिसके देह के अङ्ग अधिक प्रकट नहीं हुए हैं ऐसा गर्भ जिस स्त्री का नष्ट हो जाता है उस अत्यन्त भयंकर जातहारिणी को दुर्धरा कहते हैं।

8. कालरात्रि—

संपूर्णाङ्गं यदा गर्भं हरते जातहारिणी ॥
कालरात्रीति सा प्रोक्ता दुःखात् स्त्री तत्र जीवति ॥
(का.कल्प.स्था. 6/38-39)

जब जातहारिणी सम्पूर्ण अङ्गों वाले (अर्थात् पूर्ण रूप से बने हुए) गर्भ का हरण कर लेती है उसे कालरात्रि कहते हैं। इसमें स्त्री बड़े दुःख से जीवित रहती है।

9. मोहिनी—

यया विषज्जते गर्भः प्रतीतो वाऽथ मुच्यते ॥
स्त्रीविनाशाय सा प्रोक्ता मोहिनी जातहारिणी ॥

(का.कल्प.स्था. 6/39-40)

जिसके द्वारा गर्भ आक्रान्त होता है अथवा वह अपने स्थान से मुक्त हुआ प्रतीत होता है उस जातहारिणी को मोहिनी कहते हैं। इससे स्त्री विनष्ट हो जाती है।

10. स्तम्भनी—

यस्या नस्पन्दते गर्भः स्तम्भनी नाम सा स्मृता ॥

(का.कल्प.स्था. 6/40)

जिसका गर्भ स्पन्दन नहीं करता उसे स्तम्भनी कहते हैं।

11. क्रोशना—

उदरस्थो यया क्रोशेत् क्रोशना नाम सा स्मृता ॥

(का.कल्प.स्था. 6/41)

जिस जातहारिणी के कारण उदर में स्थित हुआ गर्भ आक्रोश करता है (चिल्लाता) है उसे क्रोशना कहते हैं।

याय जातहारिणी के भेद एवं लक्षण

1. नाकिनी—

जायते तु मृतं नित्यं यस्या नार्याः सवे सवे ॥
नाकिनीमिति तां विद्यादारुणां जातहारिणीम् ॥

(का.कल्प.स्था. 6/42-43)

जिस स्त्री का सन्तान नित्य मृत उत्पन्न होता है उस दारुण जातहारिणी को नाकिनी कहते हैं।

2. पिशाची—

जातं जातमपत्यं तु यस्याः सद्यो विनश्यति ॥
पिशाची नाम सा घोरा मांसादी जातहारिणी ॥

(का.कल्प.स्था. 6/43-44)

जिस स्त्री के पुत्र उत्पन्न होते ही तत्काल नष्ट हो जाते हैं उस मांस भक्षण करनेवाली घोर जातहारिणी को पिशाची कहते हैं।

जो उत्पन्न सन्तान जन्म के दूसरे दिन से लेकर पंद्रहवें दिन तक की आयु में मृत्यु को प्राप्त होते हैं उनके नाम इस प्रकार हैं—

3. द्वितीय दिवस नष्ट हो जाते हैं उसे यक्षी

4. तृतीय दिवस नष्ट हो जाने वाली को आसुरी

5. चतुर्थ दिवस नष्ट हो जाने वाली को कलि
6. पांचवें दिवस नष्ट हो जाने वाली को वारुणी
7. छठे दिवस नष्ट हो जाने वाली को षष्ठी
8. सातवें दिवस नष्ट हो जाने वाली को भीरुका
9. आठवें दिवस नष्ट हो जाने वाली को याम्या
10. नवें दिवस नष्ट हो जानेवाली को मातङ्गी
11. दसवें दिवस नष्ट हो जानेवाली को भद्रकाली
12. ग्यारहवें दिवस नष्ट हो जानेवाली को रौद्री
13. बारहवें दिवस नष्ट हो जानेवाली को वर्धिका
14. तेरहवें दिवस नष्ट हो जानेवाली को चण्डिका
15. चौदहवें दिवस नष्ट हो जानेवाली रेवती को कपालमालिनी
16. पन्द्रहवें अर्थात् एक पक्ष के बाद जिसका गर्भ नष्ट होता है उसे पिलिपिच्छिका कहते हैं।

असाध्य जातहारिणियों के भेद एवं लक्षण

1. वश्या —

यस्यास्तु गर्भरूपाणि पञ्च षट् सप्त वा मुने! । म्रियन्तेऽनन्तरं वश्या असाध्या जातहारिणी ॥

(का.कल्प.स्था. 6/49)

जिस स्त्री के गर्भरूप बालक 5, 6 या 7 मास की अवस्था में नष्ट हो जाते हैं उसे वश्या नाम की असाध्य जातहारिणी कहते हैं ।

2. कुलक्षयकरी—

म्रियन्ते दारका यस्याः कन्या जीवन्त्ययत्नतः । कुलक्षयकरी नाम साऽसाध्या जातहारिणी ॥

(का.कल्प.स्था. 6/50)

जिसके पुत्र मर जाते हैं तथा कन्याएँ बिना यत्न के भी जीवित रहती हैं उसे कुलक्षयकरी नाम की असाध्य जातहारिणी कहते हैं ।

3. पुण्यजनी—

जातं जातमपत्यं तु यस्याश्च म्रियते स्त्रियाः । घोरा पुण्यजनी नाम साऽसाध्या जातहारिणी ॥

(का.कल्प.स्था. 6/51)

जिस स्त्री की सन्तान उत्पन्न होते ही मर जाती है उसे भयंकर पुण्यजनी नाम की असाध्य जातहारिणी कहते हैं ।

4. पौरुषादिनी—

निष्पन्नं म्रियतेऽपत्यं यस्याः प्राक् षोडशाब्दतः । पौरुषादिनी सा प्रोक्ता असाध्या जातहारिणी ॥

(का.कल्प.स्था. 6/52)

जिसका पुत्र 16 वर्ष की अवस्था से पूर्व मर जाता है उसे पौरुषादिनी नाम की असाध्य जातहारिणी कहते हैं ।

5. संदंशी—

बिभर्त्यन्यं यदा गर्भं तदा पूर्वः प्रमीयते । संदंशीति वदन्त्येनामसाध्यां जातहारिणीम् ॥

(का.कल्प.स्था. 6/53)

जब स्त्री दूसरे गर्भ को धारण करती है तब उसका पहला गर्भ (पुत्र) नष्ट हो जाता है, तब उसे संदंशी नाम की असाध्य जातहारिणी कहते हैं ।

6. कर्कोटकी—

गर्भेणैकं ग्रहेणैकं मृत्युनैकेन युज्यते । एषा कर्कोटकीत्युक्ता दारुणा जातहारिणी ॥

(का.कल्प.स्था. 6/54)

जिस स्त्री का एक गर्भ ग्रह ग्रसित एवं एक गर्भ की मृत्यु (यमजों में) हो जाए तो उस भयंकर जातहारिणी को कर्कोटकी कहते हैं ।

7. इन्द्रवडवा—

यमजं म्रियते यस्या एकं वोभयमेव वा । तामाहुरिन्द्रवडवामसाध्यां जातहारिणीम् ॥

(का.कल्प.स्था. 6/55)

जिसके एक या दोनों यमज मर जाते हैं उस असाध्य जातहारिणी को इन्द्रवडवा कहते हैं ।

8. बडवामुखी—

एकनाभिप्रभवयोरेकश्चेन्म्रियते पुरा । म्रियते तद्वदप्येकस्तामाहुर्बडवामुखीम् ॥

(का.कल्प.स्था. 6/56)

एक नाभि से उत्पन्न होनेवाले अर्थात् यमज में से यदि एक की पहले मृत्यु हो जाय तो दूसरे की भी मृत्यु हो जाती है, उसे बडवामुखी कहते हैं ।

चिकित्सा

रेंवती की मुख्य चिकित्सा में वरण बन्ध का वर्णन महर्षि काश्यप ने किया है।

अत ऊर्ध्वं वरणबन्धमुपक्रमिष्यामः । बन्धो हि गर्भिण्याः क्षयति प्रागष्टमान्मासात्, अत ऊर्ध्वं प्रतिषेधस्तस्यान्यत्र । वृद्धजीवक ! श्रद्धानानां..... धर्मक्रियावतां त्रिरात्रोपोषितानां भिषक् छुचिरुपोषितः प्रजावरणं बध्नीयात्; बद्धे चैनां दक्षिणाभिरिष्टा भिरर्चेत्, सा ह्यस्याः प्रजाः प्रयच्छति ।

(का.कल्प.स्था. 6/80)

जिस बन्धन के द्वारा गर्भ स्थित होता है तथा गर्भपात का भय नहीं रहता उस बन्धन को वरणबन्ध कहते हैं । गर्भिणी स्त्री को आठवें मास से पूर्व यह बन्ध लगाना चाहिये । इसके बाद इसका निषेध किया गया है । स्त्रियों को तीन दिन

तक उपवास कराकर उनमें प्रजावरण (सन्तान को स्थिर करने वाला) बन्ध बांधे तथा बन्धन बांधने के बाद इष्ट दक्षिणाओं के द्वारा उसकी अर्चना करें। इससे उसे सन्तान की प्राप्ति होती है।

इति प्रधानार्थमुदाहृतं परं नृणां हितार्थं भिषजां यशस्करम् ।

अलङ्घनीयं हि रहस्यमुत्तमं शुचिः प्रयुञ्जीत न तु प्रकाशयेत् ॥

(का.कल्प.स्था. 6/81)

यह उपर्युक्त वरणबन्ध का विधान मनुष्यों के हित के लिये प्रधानरूप से कहा गया है। तथा यह वैद्यों के लिये यश का देने वाला है। इस उत्तम रहस्य का लङ्घन नहीं करना चाहिये। पवित्र होकर इसका प्रयोग करना चाहिये तथा इसे किसी दूसरे पर प्रकट नहीं करना चाहिये। अर्थात् इसे रहस्य के रूप में ही रखना चाहिये। प्रत्येक व्यक्ति को यह रहस्य नहीं बताना चाहिये।

Common Ailments of Pregnancy

1. Nausea

Nausea during pregnancy is typically one of the most experienced and complained about symptoms that women report. It is known to be one of the early signs of pregnancy, and it is a symptom that is common throughout the first trimester, and sometimes even longer.

It is referred as morning sickness.

Causes :

- Not completely understood
- Linked to the production of the human chorionic gonadotropin (HCG) hormone.
- Estrogen is another hormone that rises during early pregnancy and could contribute to queasiness.
- A sensitive stomach could be made worse while trying to adapt to the changes of pregnancy.
- Stress or fatigue is suggested to cause a physical reaction within the body, leading to nausea and vomiting.

Nausea typically starts within four to eight weeks of gestation and is expected to subside between 13 and 14 weeks. However, it can start earlier and can last longer. Also, not every woman will experience nausea the entire duration of the first trimester.

Management :

1. Eating smaller meals more frequently throughout the day instead of three big meals.
2. Drinking less water/fluids with meals, and instead drink them between meals.

3. Eating drier, plain foods such as white rice, dry toast, or a plain baked potato instead of richer, creamier foods.
4. Sucking on hard candy.
5. Getting plenty of rest; try lying down when there is feeling of fatigue.
6. Sniffing ginger or lemons, or drinking ginger ale or lemonade, which can help ease the feeling of nausea.
7. Vitamins – especially vitamin B-6 supplement.

2. Heartburn

This is one of the minor disorders of pregnancy and frequently disturbing sleep and appetite.

Causes : Underlying cause is the relaxation of the lower oesophageal sphincter which occurs due to the high levels of progesterone in pregnancy. This results in gastro-oesophageal reflux, or regurgitation of the gastric contents into the lower oesophagus, and the symptom of heartburn. There is little relationship to gastric acidity; and hiatus hernia.

Clinical features : The complaint is typically a burning sensation in the retrosternal area, usually more after food and on lying down.

The symptoms appear in the late first or second trimester and worsen as the pregnancy advances. They disappear after delivery in 1-4 weeks unless there is a pre-existing gastrooesophageal reflux disease (GERD).

Diagnosis : In the non-pregnant women is made on barium studies and upper gastrointestinal endoscopy.

Treatment

- Dietary and lifestyle changes which minimize acid reflux. Mild symptoms may be controlled by taking frequent small meals and not eating late at night, avoiding spicy food, and raising the head end of the bed while lying.
- Antacids.
- Motility enhancing drugs such as metoclopramide and cisapride.
- H₂ receptor antagonists (H₂RA) which are the most commonly used drugs for the treatment of heartburn. All four drugs which are frequently prescribed, that is, cimetidine, ranitidine, famotidine, nizatidine are class B drugs and can be used in pregnancy. Omeprazole was found to have foetal toxicity in animals, and is best avoided till the safety issue in pregnant women. Lansoprazole and pantaprazole are class B drugs and can be used in pregnancy, if required.

Although the problem of heartburn usually resolves after delivery, symptoms may persist postpartum in some women requiring treatment. All systemic anti-reflux drugs are excreted in breast milk, however, the use of antacids, sucralfate and H₂RAs (except nizatidine) is considered safe for breastfeeding.

3. Fever During Pregnancy

Fever in pregnant women causes concern not only for the mother but also due to the potential harmful effects on the growing foetus. The foetus may be affected directly by the invading organism like rubella and varicella or secondary to maternal hyperthermia.

Excessive core temperature has been documented to cause malformations and act as a human teratogen found a two-fold increase in the risk of neural tube defects in women exposed to high temperature during early pregnancy.

Causes

The most common causes of fever in pregnancy, as in the non-pregnant, are viral infections like common cold and influenza, urinary tract infection, pneumonitis, typhoid and malaria in endemic areas, hepatitis, and though less common now, septic abortion.

Common cold

- Common cold is perhaps the commonest illness in pregnancy.
- The treatment is symptomatic, an antipyretic is advised when the temperature is 100°F or more. Paracetamol (acetaminophen) is the safest for short-term use in a dose of 500-1000 mg as and when required, or 4-6 hourly, not to exceed 4 g in 24 hours.
- Tepid sponging is helpful as an adjuvant to medication, if temperature is higher.
- Steam inhalation helps in relieving the congestion and blocked nose, nasal decongestants like xylometazoline can be used as second-line. Antihistaminics like chlorpheniramine and cetirizine have not been found to have any adverse effects on pregnancy and can be used for associated rhinitis.

Influenza

- Influenza or the common flu is a contagious respiratory illness due to influenza viruses.
- Pregnant women and their newborns are at an increased risk of influenza-associated hospitalization and death.

Clinical features :

- Mild illness such as fever, sore throat, fatigue, dry cough and headache.
- Severe gastrointestinal symptoms such as nausea, vomiting, diarrhoea and abdominal pain have been seen in patients requiring admission.

- Maternal risk of complications like pneumonitis increases when flu occurs in the second half of pregnancy, the risk of hospitalization being particularly high in asthmatics.
- Pregnant women are four times more likely to be hospitalized, more so in the second and third trimesters. Maternal complications include pneumonia, severe bacterial co-infection, myocarditis, seizures, encephalitis and altered mental state. Mortality rate in adults requiring admission is about 6%, mortality rate in pregnant women is unknown. The illness could also result in premature delivery.

Treatment :

- The influenza vaccine is given intramuscular in a single dose. It is an inactivated vaccine which is safe during all trimesters of pregnancy and breastfeeding.
- Antiviral drugs currently used for the treatment of influenza like amantidine and rimantidine, are not recommended routinely in pregnancy but may be used, if the benefit to the mother outweighs the potential foetal risks.

Pneumonitis

It is an important non-obstetric cause of maternal mortality, and significantly increases the risk of preterm delivery.

Cause: Bacterial or viral, and rarely fungal.

Clinical features: Fever, dyspnoea, cough with expectoration and chest pain.

On examination: An area of consolidation may be present with associated rhonchi and crepitations.

Investigation: An X-ray chest with abdominal shield is needed to confirm the diagnosis.

Treatment: Antibiotics and steam inhalation is the mainstay of treatment. Penicillins, macrolides, and cephalosporins are usually the antibiotics of choice.

Typhoid (enteric fever)

This is a bacterial infection caused by *Salmonella typhi* (also known as *Salmonella enteric serotype typhi*) and spreads by faecal-oral transmission usually by consuming contaminated food and water or close personal contact.

Clinical features : Persistent fever, abdominal pain, severe anorexia, mild diarrhoea or constipation, and delirium. A similar picture may be seen with paratyphoid fever which presents with prolonged fever, though less severe. It is caused by *Salmonella paratyphi*, a serotype of *Salmonella enterica*.

Neonatal typhoid fever may occur due to vertical transmission in late pregnancy. The manifestation may vary from an asymptomatic excretion of bacteria to life-threatening disease presenting with fever, vomiting, diarrhoea, and abdominal distension. There might be significant hepatomegaly and jaundice.

Diagnosis:

- a) Blood culture, which is confirmatory.
- b) Widal test (or Felix-Widal test) measures the agglutinating antibodies against O (somatic) and H (flagellar) antigens characteristic of Salmonellae. The O antibodies usually appear on day 6 to 8 and the H antibodies on day 10 to 12 after the onset of the disease, therefore, the test becomes positive only after about 10 days. The test has only moderate sensitivity and specificity; as the test may be negative in up to 30% of culture proven cases.
- c) Newer rapid serological diagnostic tests like Typhidot and TUBEX have been developed which target IgM and IgG produced in response to different antigens of S. typhi, but they lack sensitivity and specificity when compared with culture.

Treatment: The beta-lactams and ampicillin are safe in pregnancy. Ceftriaxone may be the drug of choice in pregnancy in areas with drug resistant enteric fever. It can be given IM or IV in a dose of 50-75 mg/ kg per day (2-4 g per day) in one or two doses for 7-14 days. Azithromycin may be used as alternative in a dose of 10 mg/kg per day (500 mg/day) for seven days.

4. Pain in Abdomen during Pregnancy

Pain in abdomen during pregnancy is a common symptom. Pain could be due to obstetrical, gynaecological, medical or surgical causes. In advanced pregnancy, diagnosis of non-obstetric causes is difficult.

Causes

Pains may be caused by physiological and pathological reasons. Some of the causes are not life threatening while other are life threatened and need urgent treatment. The causes of pain in abdomen given below:

A. Pregnancy related

a. Physiological

- Round ligament stretching
- Braxton-thick contractions
- Severe uterine torsion (when dextrototation is aggravated and change in position of mother relise the symptoms)
- Miscellaneous pain due to uterine muscle stretching

b. Pathological**1. Early pregnancy**

- Abortion including induced abortion
- Ectopic pregnancy
- Cystitis
- Retention of urine

2. Late pregnancy

- Labour pains
- Severe preeclampsia
- Accidental haemorrhage
- Rupture uterus
- Acute hydramnios
- Acute pyelitis/pyeloneptisitis

B. Incidental causes**a. Physiological**

- Heart burn
- Excessive vomiting
- Constipation

b. Pathological

- Red degeneration in fibroid
- Torsion of ovaries cyst a Surgical
- Acute appendicitis
- Acute cholecystitis, gall stones
- Urinary stones
- Intestinal obstruction

c. Medical

- Acute pencreatitis
- Peptic ulcer
- Colitis
- Diarrhoea
- Dyscentry

Diagnosis

- History taking and a thorough physical examination
- Clinical examination

- Appropriate laboratory investigation
- Ultrasound.

Management

- As per cause is ruled out.

High Risk Pregnancy

Definition

All pregnancies and deliveries are potentially at risk. However, there are certain categories of pregnancies where the woman, the foetus or the neonate is in a state of increased jeopardy.

High risk pregnancy is those pregnancy which is complicated by certain factors that adversely affect or complicate the pregnancy outcome - maternal or prenatal or both.

About 20 to 30% pregnancies belong to this category. For improvement of obstetrical results, this group must be identified and given extra care. Even with adequate antenatal and intranatal care, this small group is responsible for 70 to 80% of perinatal mortality and morbidity.

In the developing countries with a high maternal and perinatal mortality, the maternal factors should also be considered. The risk factors may be pre-existing prior to or at the time of first antenatal visit or may develop subsequently in the ongoing pregnancy, labour or puerperium. It must be remembered that over 50 % of all maternal complications and 60 % of all primary caesarean sections arise from the high risk group of cases.

Screening of High Risk Cases

The cases are assessed at the initial antenatal examination, preferably in the first trimester of pregnancy.

Initial Screening

1. Maternal age:

- Pregnancy below the age of 17 or above the age of 35 years.
- Primigravidae above the age of 30 years.

2. Reproductive history:

- Two or more previous abortions or previous induced abortion. These cases run the risk of further abortion or preterm delivery.
- Previous stillbirth, neonatal death or birth of babies with congenital abnormality.
- Previous preterm labour or birth of a small for date baby or, weight of baby 3.5 kg or more.

- Grand multiparity.
- Previous caesarean section or hysterectomy.
- Pre-eclampsia, eclampsia.
- Anaemia.
- Third stage abnormalities.
- Previous infant with Rh-isoimmunisation or ABO incompatibility.

3. Medical or surgical disorders:

- Pulmonary disease- Tuberculosis
- Renal disease- Pyelonephritis
- Thyroid disorders
- Psychiatric illness
- Cardiac disease
- Epilepsy
- Viral hepatitis

4. Previous operations:

- Myomectomy
- Repair of complete perineal tear
- Repair of vesico-vaginal fistula
- Repair of stress incontinence
- Previous two or more caesarean section

5. Family history:

- Low socio-economic status – Poor patients have a higher incidence of anaemia, preterm labour and growth retarded babies.
- Working women who have to undertake long road journeys, have a higher incidence of recurrent abortion or premature labour.
- Family history of diabetes, hypertension or multiple pregnancy (maternal side), congenital malformation.

According to WHO, identifications of high risk cases

A. During pregnancy:

- Elderly primi (>30 years),
- Short statured primi (< 140 cm)
- Threatened abortion and Antepartum haemorrhage
- Malpresentations

- Pre-eclampsia and eclampsia
- Anaemia
- Elderly grand multiparas
- Twins and hydramnios
- Previous still birth, IUD, manual removal of placenta
- Post dated pregnancy
- History of previous caesarean section and instrumental delivery
- Pregnancy associated with medical diseases.

B. During labour :

- Premature rupture of membrane
- Prolonged labour
- Hand, feet or cord prolapsed
- Placenta retained more than half an hour
- Post partum haemorrhage
- Puerperal fever and sepsis

Examination

A. General Physical Examination

- Height: Below 145 cm
- Weight: Overweight or underweight
- High blood pressure
- Anaemia
- Cardiac or pulmonary disease
- Orthopaedic problems

B. Pelvic Examination

- Uterine size - disproportionately smaller or bigger
- Genital prolapse
- Lacerations or dilatation of the cervix
- Associated tumours
- Pelvic inadequacy

Complications during Labour in High risk cases :

- Premature labour
- Premature or prolonged rupture of membranes



- Patients admitted with prolonged or obstructed labour
- Meconium stained liquor
- Rupture uterus
- Abnormal presentation and position
- Disproportion, floating head in labour
- Intrapartum foetal distress
- Delivery under general anaesthesia
- Difficult forceps or breech delivery
- Failed forceps
- Prolonged interval from the diagnosis of foetal distress to delivery
- Post-partum haemorrhage or retained placenta.

High risk neonates

- Apgar score below 6
- Hypoglycaemia
- Anaemia
- Birth weight less than 2.5 kg or more than 4 kg
- Major congenital abnormalities
- Convulsions
- Foetal infection
- Jaundice
- Respiratory distress syndrome
- Persistent cyanosis

Management

1. Regular Antenatal checkups - After the initial visit, these high risk cases should be reassessed at each antenatal visit, detect any abnormality that might have arisen later.
2. Folic acid (4 mg/day) therapy should be started in the prepregnant state and is continued throughout the pregnancy.
3. Early in pregnancy after the initial clinical examination, routine and special laboratory investigations should be undertaken.
4. Necessary advice should be given regarding diet, activities, rest and medicines. Minimum medicines should be taken during pregnancy, particularly in the early months.
5. Assessment of maternal and foetal well being : It should be done at each antenatal visit according to the guidelines. Maternal complications should be looked for and treated, if necessary.

6. Patient with history of previous first trimester abortion should be advised rest and to refrain from sexual intercourse. Vaginal examination should be avoided in first trimester in these cases.
7. Patients suspected to have cervical incompetence should have Sonographic evaluation early in second trimester so that cervical encirclage, if necessary, may be performed at appropriate time.
8. Patients having premature labour, unexplained stillbirth, intrauterine growth restriction and many other abnormalities are benefited by prolonged rest in hospital with close supervision.
9. Management of labour :
 - a) It is evident that elective caesarean section is necessary in a high-risk case. Some cases may need induction of labour after 37-38 completed weeks of gestation. Those cases that go into labour spontaneously or after induction, need close monitoring during labour for the assessment of progress of labour or for any evidence of the foetal hypoxia.
 - b) The condition of the foetus can be assessed by
 - Foetal heart rate monitoring: By stethoscope, fetoscope or doppler
 - Continuous electronic monitoring
 - Passage of meconium in the liquor
 - Examination of foetal scalp blood for pH values.

Elderly Primigravida

All women going through their first pregnancy over the age of 35 years should be considered high risk for pregnancy and known as elderly primigravida.

With increasing incidence of delayed marriage, career priorities, divorce followed by remarriage, advanced contraception methods and artificial reproductive technologies, more and more women now become pregnant for the first time after the age of 35.

Complications in Pregnancy

1. Fertility rate decreases as age advances (a normal woman's fertility is at its peak between 18 and 25 years of age)
2. Elderly primigravida has a greater tendency to abort. The most common cause of abortion is chromosomal abnormalities. Chromosomal abnormalities produces like Down syndrome. Other non-chromosomal causes include anatomical and endocrine abnormalities, thrombophilias and immunological etc.

Hypertension gravidarum is somewhat more common in the elderly primigravida.

4. Pre-eclampsia is more common in elderly since increasing age itself favours hypertensive disease and reduces the resilience of the cardiovascular system as a whole.
5. The incidence of gestational diabetes is increased, as also the likelihood of type 2 diabetes mellitus.
6. Placenta praevia is more common. Placental abruption may be favoured by hypertensive disease.
7. Advanced maternal age is an independent risk factor for intrauterine growth restriction may be due to placental insufficiency in the third trimester.
8. Women over 30 years have a greater chance of having multiple pregnancy.

Complications during Labour

1. Premature labour.
2. The duration of labour tends to be increased by about 25% on an average due to the greater anxiety of the older woman facing labour for the first time, and some degree of inertia is common.
3. Posterior positions of the occiput are much more usual and labour is likely to be prolonged because of this malposition.
4. Inertia is also likely to complicate the case where labour has been induced, and the response to induction tends to be more unsatisfactory due to impaired elasticity of the soft tissues of the birth canal.
5. Signs of maternal distress in labour appear more readily in the older woman.
6. Instrumental delivery is required about two or three times as often as in younger women and the caesarean section rate is increased fourfold. The perineum and lower vagina do not stretch so well, so that large episiotomy is often indicated.
7. Manual removal of the placenta is required more frequently.

Complications of baby born

1. The incidence of neurodevelopment and neuropsychiatric disorders is increased in babies of elderly primi gravidae. Prematurity and IUGR are important contributing factors.
2. The risk of cerebral palsy and autism is also increased.

Maternal Mortality

Maternal mortality is significantly higher due to maternal medical disorders, mode of delivery and prematurity.

Management

Elderly primi gravida requires close supervision both during pregnancy and labour.

These patients should be considered as high-risk cases and advised institutional delivery. A preconception counselling is highly desirable and some point to be followed:

- Periconceptional folic acid supplementation.
- A detailed history of pre-existing diseases like diabetes, hypertension, renal or thyroid disorder, or other medical conditions and investigations for those.
- First trimester ultrasonography for assessment of nuchal translucency and nasal bone, again at 11-14 weeks and again at 18-20 weeks to exclude congenital malformations.
- Blood pressure should be monitored regularly. Screening for gestational diabetes by a one-step glucose tolerance test (GTT) should be done at 22-24 weeks gestation.
- At term pelvis should be assessed clinically before contemplating vaginal delivery.

Grand Multipara

Giving birth after 28 weeks period of gestation following previous 4 or more viable births is termed as grand multiparity.

In obstetric it is considered a high-risk case for both mother and baby, risk decreases in the second and third, and then increases again. The risk in the 6th pregnancy is more than in the first pregnancy, after which there is a steep increase. Women undergoing 10th or more birth are called great-grand-multiparae.

The incidence of anaemia, hypertensive disease, including preeclampsia superimposed on chronic hypertension, haemorrhage of all varieties before, during and after delivery and uterine rupture is increased.

Complications in Pregnancy

1. The abortion rate is increased
2. Anaemia is too common in multiparous pregnancy
3. Hypertensive vascular disease
4. Twin pregnancy is about three times as common in grand multipara
5. Placenta praevia is more common and antepartum haemorrhage may be very sudden and profuse, so that its effects in the likely presence of iron deficiency anaemia are magnified.
6. Mal-presentations are more common. The pendulous abdomen and lordosis of the lumbar spine favor occipitoposterior, face and brow presentation and in any case, it is usual for the head not to engage in the pelvis until the onset of labour.

Complications in Labour

Malpresentation and cephalo pelvic disproportion is common due to laxity of

These patients should be considered as high-risk cases and advised institutional delivery. A preconception counselling is highly desirable and some point to be followed:

- Periconceptional folic acid supplementation.
- A detailed history of pre-existing diseases like diabetes, hypertension, renal or thyroid disorder, or other medical conditions and investigations for those.
- First trimester ultrasonography for assessment of nuchal translucency and nasal bone, again at 11-14 weeks and again at 18-20 weeks to exclude congenital malformations.
- Blood pressure should be monitored regularly. Screening for gestational diabetes by a one-step glucose tolerance test (GTT) should be done at 22-24 weeks gestation.
- At term pelvis should be assessed clinically before contemplating vaginal delivery.

Grand Multipara

Giving birth after 28 weeks period of gestation following previous 4 or more viable births is termed as grand multiparity.

In obstetric it is considered a high-risk case for both mother and baby, risk decreases in the second and third, and then increases again. The risk in the 6th pregnancy is more than in the first pregnancy, after which there is a steep increase. Women undergoing 10th or more birth are called great-grand-multiparae.

The incidence of anaemia, hypertensive disease, including preeclampsia superimposed on chronic hypertension, haemorrhage of all varieties before, during and after delivery and uterine rupture is increased.

Complications in Pregnancy

1. The abortion rate is increased
2. Anaemia is too common in multiparous pregnancy
3. Hypertensive vascular disease
4. Twin pregnancy is about three times as common in grand multipara
5. Placenta praevia is more common and antepartum haemorrhage may be very sudden and profuse, so that its effects in the likely presence of iron deficiency anaemia are magnified.
6. Mal-presentations are more common. The pendulous abdomen and lordosis of the lumbar spine favor occipitoposterior, face and brow presentation and in any case, it is usual for the head not to engage in the pelvis until the onset of labour.

Complications in Labour

1. Malpresentation and cephalo pelvic disproportion is common due to laxity of

abdominal muscles and non-engagement of head. In grand multiparity the increasing inclination of the pelvic brim and the subluxation forwards of the sacrum upon the sacroiliac joints causes sacral promontory advances and the true conjugate is effectively reduced. Failure to recognize this condition may end in uterine rupture, especially in the presence of tumultuous labour.

2. Cord prolapse
3. Obstructed labour due to malpresentation, malposition & cephalo pelvic disproportion
4. Uterine contractions tend to be more coordinated and forceful in multiparous labour, whereas the strength of the myometrium to resist rupture is considerably reduced by successive pregnancies.
5. Rupture uterus in case of undetected obstructed labour.
6. Postpartum haemorrhage and obstetric shock is consequent features.
7. The puerperal morbidity rate is not increased unless major complications arise during labour.

Mortality

Maternal mortality rises with higher degrees of parity, increasing progressively with each child after the fifth delivery, rupture uterus, chronic hypertensive disease and placental complications are some of the important causes that contribute to both morbidity and mortality, although mortality can now be prevented in most cases with good obstetric care.

Management

- Proper antenatal care
- Hospital delivery is mandatory
- Pelvic assessment should be done during labour
- Position & Presentation are to be checked
- Any delay in the progress of labour should be viewed
- To take prophylactic measures against post partum haemorrhage

Grand multiparity today is mostly a reflection of unmet needs for contraception and health care. All these patients should preferably be encouraged to adopt a permanent method of sterilization.

Bad Obstetric History

Bad obstetric history refer to patients with previous 2 or more consecutive spontaneous abortions, stillbirths, intrauterine growth restriction, early neonatal death and/or congenitally malformed babies.

Cause : Genetic, immunological, hormonal and maternal infections.

History taking

- Any history of stillbirth.
- In case of neonatal death, the gestational age and weight should be known, and also the duration of life and the cause of death.
- The duration of previous labour should be ascertained. Very prolonged labours and precipitate deliveries are relevant. The indications for caesarean section, if done in the past, are important, e.g. if placenta praevia had been the reason.
- The subject of intrauterine death always raises the question whether the same factors might operate again.
- Maternal syphilis has been classically described as causing an 'ascending' pattern of foetal loss; therefore, a VDRL test in pregnancy should be done.
- TORCH testing is often recommended in women with bad obstetric history.
- The antiphospholipid syndrome (APS) is now recognized as an important factor in recurrent pregnancy loss. It may present as recurrent early first trimester abortions, early onset severe pre-eclampsia, HELLP syndrome, placental abruption, thrombocytopenia and severe placental insufficiency resulting in premature delivery or intrauterine death, or unexplained foetal death after 10 weeks of pregnancy. Low dose aspirin (50 mg/day) is indicated in patients with positive antiphospholipid antibodies & with thrombophilias.
- The incidence of foetal abnormality climbs steeply with each instance. After one malformed baby, the chances of recurrence are about six to eight times as great, and after two such consecutive disasters the chances of a third are in the region of 60-70%. Pre-pregnancy counselling is vital in such cases. In the individual case, every effort must be made to find out the type of malformation in previous pregnancy, by history or preferably by old records, to assess the risk of recurrence of a similar problem in the next pregnancy. Maternal history of diabetes, thyroid disease congenital heart disease, and intake of drugs during pregnancy must be elicited. The case with previous neural tube defects must receive timely advice regarding the need for periconceptional folic acid. Any previous history of foetal abnormality indicates the need for targeted ultrasonography, including foetal echocardiography. If there is a history of chromosomal abnormality, she needs to be counselled regarding chorion villus sampling or amniocentesis.
- The previous history of pre-eclampsia or any hypertensive disorder indicates a closer supervision in this pregnancy.

- The problem of rhesus isoimmunisation is also significant.
- In any case in which a previous disaster was associated with a suspicion of disproportion, it is worthwhile perusing the full notes of that labour. It must be remembered that trials of labour fail more often because of uterine inertia than because of the dimensions of the bony pelvis. In other cases, there may be an unfavourable position of the foetal head that tilts the balance in a borderline case. The present pregnancy should, therefore, be very critically considered in the light of this information before deciding if an elective caesarean section is necessary.
- An assessment of the growth parameters and liquor volume by ultrasound coupled with a clinical assessment of the cervical status guides the timing of induction of labour.
- A history of third stage complications is always relevant, and adherent placenta particularly tends to be recurrent.
- Previous injuries to the bladder, particularly vesicovaginal fistula of obstetrical origin, that have been successfully treated, demand caesarean section rather than the risk of repeating this calamity.
- History of third-degree tears and damage to the rectum need careful assessment to decide for the appropriate mode of delivery.

Management

1. The good obstetric history plays an important role in prevention and management of bad obstetric history. Pre conceptional counselling is very important in these patients.
2. Principles of mangement—
 - a. To find out the cause
 - b. To rectify the abnormality, if possible
 - c. To remain vigilant till delivery
3. In case of any doubt regarding the safety or acceptability of vaginal delivery, the patient is planned for elective caesarean section.

Obesity

According to World Health Organization normal weight as a body mass index (BMI) of 18.5-24.9 kg/m², overweight as 25-29.9 kg/m², and obesity as 30 kg/m² or greater. BMI expressed as weight (in kg) divided by height² (in m). Obesity is further categorized according to BMI into:

- Class I : 30-34.9 kg/m²
- Class II : 35-39.9 kg/m²
- Class III : 40 kg/m² or more

As the incidence of obesity is increasing, more and more women are becoming pregnant who are overweight or obese at the time of conception.

Complications in pregnancy

1. There is decreased fertility among overweight and obese women. Factors associated may be hyperandrogenism, polycystic ovaries and anovulatory cycles.
2. Maternal haemodynamic changes in pregnant obese women include hypertension, haemo-concentration and poor cardiac function. Chronic hypertension, with or without superimposed pre-eclampsia, is the most common complicating factor in obese pregnant women.
3. Obesity is a risk factor for carbohydrate intolerance both in pregnant and non-pregnant women. The fasting and post-prandial plasma insulin has been shown to be higher in obese pregnant women when compared to non-obese. It is possible that the association of obesity, hypertension and diabetes may be a manifestation of syndrome X.
4. The risk of congenital malformations is higher in obese and overweight women. Patients may have undiagnosed pre-gestational diabetes detected first time during pregnancy, which is associated with neural tube defects and other malformations.
5. Malpresentations, as might be expected.
6. Increased risk of pregnancy going postdates and post-term and lower chances of spontaneous onset of labour at term.
7. Oedema of the lower extremities is exaggerated, which further reduces comfortable mobility.

Complications during labour

1. Labour is no better favoured by obesity.
2. The need for induction is commoner because of hypertension, pre-eclampsia, diabetes or postdatism, and labour is often tiresomely inert and incoordinate.
3. Minor degrees of disproportion may only become known by unsatisfactory progress of labour. Babies of overweight and obese women are heavier than normal weight women thus increasing the chances of shoulder dystocia and birth trauma.
4. Increases in the risk of operative interventions including caesarean sections in case of macrosomic baby. Apart from obesity, excessive weight gain during pregnancy is also a risk factor for macrosomia and associated complications.
5. Risk of sudden intrauterine death is also increased.
6. The need for operative delivery both by forceps and caesarean section is doubled.



7. Postpartum haemorrhage is also more common and veins are less accessible for transfusion.

Complications in baby born

1. Babies are often much larger or macrosomic baby (Birth weight > 4000g) and the increased skin-fold thickness of the abdominal wall makes clinical examination unsatisfactory for conventional assessment of foetal presentation and growth by abdominal palpation.

Post partum complications

1. Postoperative complications are more common and the duration of hospital stay is longer. The thickness of the abdominal wall because of abdominal fat may discourage healing by primary intention. The Pfannenstiel incision is advantageous in these cases from the point of view of recovery, although it may not be the easiest for delivering a large baby.
2. Obese women do not lactate as well as their thinner sisters. The babies of these patients have a higher perinatal mortality partly because of maternal hypertension and diabetes, and partly because of more difficult delivery.

Management

Major degrees of obesity are an indication for adequate antenatal supervision and hospital delivery. Increased vigilance for pre-eclampsia and gestational diabetes is necessary and anaemia should be detected at an early stage. All obese women should be screened for asymptomatic bacteriuria. Screening for gestational diabetes, therefore, needs to be performed at 24 weeks and again at 32-34 weeks, if the earlier is negative.

Appetite killing drugs and tranquillizers are not recommended but a high protein and low fat and carbohydrate diet should be encouraged, preferably with the expert help of a dietician.

Hyperemesis Gravidarum

When the vomiting is excessive, the pregnant woman is unable to retain anything taken orally and develop metabolic acidosis. This condition is known as hyperemesis gravidarum.

Cause:

- More commonly seen in primigravida,
- Multiple pregnancy,
- Vesicular mole.

On examination:

- Sign of dehydration (dry tongue, loss of elasticity of skin, oliguria),
- Tachycardia may be present,
- Urine shows presence of ketone bodies (acetone).

Management:

- Hospitalization.
- IV fluids: ringer lactate and dextrose saline to correct hydration.
- Reassurance and counselling.
- Urine examination is repeated every 4 hours till it becomes negative for ketone bodies.
- Antiemetic injection stemetil (Prochlorperazine) 5 mg or Phenagan (Promethazine 25 mg) 8 hourly (24-48 hours) may be required to control vomiting. Once the vomiting stops and dehydration is corrected the woman may be discharged after 24 hours, with advice to take small frequent carbohydrate meals.
- Vitamin B₁, Vitamin B₆, Vitamin B₁₂ & Vitamin C supplementation.

Excessive vomiting may also be caused by jaundice, meningitis, diabetes and uraemic coma and also by peritonitis caused by induced septic abortion. Hence, exclude these conditions by thorough history, clinical examination and investigations wherever required.

Anaemia in Pregnancy

Anaemia is the commonest haematological disorder that may occur in pregnancy. According to the standard laid down by WHO, anaemia in pregnancy is present when the haemoglobin concentration in the peripheral blood is 11 gm/100 ml or less.

Clinical features

The onset of symptoms is slow

- a) Pallor of mucous membrane
- b) Breathlessness
- c) Dizziness
- d) Tiredness and lethargy

In case of severe anaemia:

- a) Tachycardia
- b) Renal hypoxia causing sodium retention and oedema
- c) Soft systolic murmur.
- d) Crepitations may be heard
- e) Myocardial hypoxia leading to heart failure.

Grading of anaemia

- Mild- 8 gm % to 10 gm % haemoglobin
- Moderate- 7 gm% to 8 gm% haemoglobin
- Severe- Less than 7 gm% haemoglobin

Investigations

- Haemoglobin estimation
- Peripheral blood smear
- MCHC
- MCV
- MCH
- PCV
- Total red cell count
- Stool examination- R/M
- Urine examination- R/M, C/S.

General Treatment

1. Diet- Balanced diet rich in protein, iron and vitamins and easily digestible should be given. Acid pepsin may be given to improve the appetite and facilitate digestion.
2. Appropriate antibiotic therapy may be given to eradicate even a minimal septic focus.
3. The cause of anaemia should be found out and effective therapy should be instituted to cure the disease.

The principle is to raise the haemoglobin level as near to normal as possible. Thereafter, an attempt is made to restore the iron reserve before the mother goes in labour.

Choice of therapy depends on: Severity of anaemia, duration of pregnancy and associated complicating factors.

Iron Therapy

1. Oral Iron Therapy : 120 - 180 mg/ day in divided doses. (Feroous sulphate, ferroous fumerate, ferroous ascorbate).

The woman should be informed that her stools may turn black. She may develop nausea, diarrhoea, constipation and epigastric pain. These discomforts may be reduced by taking iron after meals.

2. Parenteral Iron Therapy :

- IM or IV route bypasses the gastro-intestinal tract. This is an advantage for women who are unable to tolerate or absorb oral iron.

- Contraindicated for women who have liver or renal disorders.
 - Dose of iron infusion: iron dextran 50 mg/ml in a slow intravenous infusion of normal saline.
- Blood transfusion is used to raise haemoglobin level quickly if delivery is expected shortly.

Complications of Severe Anaemia

- A. During pregnancy:
 1. Pre-eclampsia
 2. Intercurrent infections
 3. Heart failure
 4. Pre-term labour
- B. During labour:
 1. Uterine inertia
 2. Post partum haemorrhage
 3. Cardiac failure
 4. Shock
- C. Puerperium
 1. Puerperal sepsis
 2. Sub involution
 3. Failing lactation
 4. Venous thrombosis
 5. Pulmonary embolism.

Diabetes

During each antenatal visit, urine is examined as a routine for the presence of sugar. This is due to the fact that asymptomatic varieties of diabetic trait are responsible for significant foetal wastage.

Repeat and random samples taken on one or more occasions throughout pregnancy reveal glycosuria in about 5-50 percent cases. The incidence, however falls significantly if only fasting samples are tested which is of significance.

The foetus obtains glucose from its mother via the placenta by a process of diffusion. During third trimester the mother begins to utilise fat stores which were laid down during the first two trimesters. This results in a rise in free fatty acids and glycerol in the blood streams and the mother will become ketonic more easily.

The foeto-placental unit alters the mother's carbohydrate metabolism in order to make

glucose more easily available. The placenta manufactures human placental lactogen which produces a resistance to insulin in the maternal tissues. This results in blood glucose levels which are higher after meals and remain raised for longer than in the non pregnant state. Oestrogen and progesterone contribute to these changes and at the end of pregnancy cortisol levels rise which also leads to a rise in blood glucose. More insulin is produced, sometime two or three time as much as in the non pregnant state.

The extra demands on the pancreatic beta cells can precipitate glucose tolerance or overt diabetes in women whose capacity for producing insulin was only just adequate prior to pregnancy. If the mother was already diabetic before pregnancy, her insulin needs will be increased.

Glycosuria in Pregnancy

Glucose is more liable to appear in the urine of a pregnant woman because:

- 1) In the diabetic, the rise of blood glucose leads to more glucose in the glomerular filtrate which cannot be all reabsorbed.
- 2) In a non diabetic, the blood glucose remains within normal limits but the glomerular filtration rate rises. Glucose passes through the proximal convoluted tubule faster than it can be reabsorbed.
- 3) Renal tubular damage interferes with glucose reabsorption and may exhibit for the first time during pregnancy.

Glycosuria in pregnancy is not diagnostic of diabetes nor it can be used as a monitor of diabetes in the pregnant woman.

Gestational Diabetes Mellitus (GDM)

GDM includes the cases with abnormal carbohydrate tolerance with onset or first detected during present pregnancy.

Certain women are at special risk of developing diabetes during pregnancy and may be identified when the history reveals one or more of the following:

- a) Diabetes in a close family member
- b) Recurrent abortion
- c) Unexplained still birth
- d) Congenital abnormality
- e) A baby whose birth weight was greater than the 10th percentile for gestational age (4 kg or more at 40 weeks)
- f) Previous gestational diabetes or impaired glucose tolerance
- g) Persistent glycosuria

- h) Age over 30 years
- i) Obesity

The progressive increase in insulin demand during pregnancy can make latent diabetes appear. This may resolve after the pregnancy. Some women show a slightly impaired glucose tolerance during pregnancy which returns to normal after delivery.

The mother needs more frequent antenatal supervision with periodic check up of fasting blood glucose level which should be less than 90 mg percent.

Diagnostic Measures Used for Detecting Diabetes in Pregnancy :

- a) Confirmation is to be done by testing a second fasting morning specimen of urine. Urine is also tested for acetone.
- b) Blood glucose estimations — Fasting and again two hours after ingestion of 75 gm of glucose are done.

If the fasting blood sugar exceeds 90 mg/100 ml or if that after two hours of food is over 120 mg/100 ml, then glucose tolerance test with 100 gm (WHO - 75 gm) glucose is to be performed.

- c) Ultrasonography evaluation in pregnancy is extremely helpful for detection of congenital malformation of foetus, or growth retardation (rate) or over weight of foetus.

The Effect of Pregnancy on Diabetes and Diabetes on Pregnancy

1. Effect of Pregnancy on Diabetes

It is difficult to stabilise the blood glucose during pregnancy due to altered carbohydrate metabolism and an impaired insulin action. The insulin antagonism is probably due to the combined effect of human placental lactogen, oestrogen, progesterone, free cortisol and degradation of insulin by the placenta. Throughout the pregnancy, there is tendency to lose glucose in the urine. As the foetus grows, the mother needs more carbohydrate and ketosis is induced more easily during the later stages of pregnancy. Ketoacidosis can be precipitated during hyperemesis in early pregnancy, infection and fasting stage during labour.

Insulin requirement falls significantly in puerperium.

Vascular changes, specially retinopathy, nephropathy, coronary artery disease, neuropathy and blindness may be worsened during pregnancy.

2. Effect of Diabetes on pregnancy

When diabetes is well controlled its effect on pregnancy may be minimal. Uncontrolled conditions lead to complications. There is an increased risk of spontaneous abortion and still birth. The perinatal mortality is 2 to 3 times higher for diabetic mother.

Diabetic women are more prone to urinary tract infection and greater susceptibility to candida albicans. The incidence of pre-clampsia and polyhydramnios is increased. Severe maternal ketosis can cause intra-uterine death.

Baby of mother with poorly controlled diabetes may be larger than normal. Birth weight and body length are both greater.

Preterm labour, prolonged labour, shoulder dystocia, perinatal injuries, post partum haemorrhage are common in diabetic mother during labour.

The goal of pre-pregnancy care of the known diabetes is to achieve strict control of diabetes before onset of pregnancy. Ideally a diabetic mother should be seen jointly by obstetrician, diabetologist and dietician.

Principles of Management

- 1) Careful antenatal supervision and control of diabetes.
- 2) To find out optimum time and method of delivery.
- 3) Arrangement for the care of the new born.

Antenatal Care

- 1) Antenatal check-up should be done at monthly interval upto 20 weeks. Thereafter every two weeks upto 30 weeks of pregnancy.
- 2) Constant vigilance should be done.
- 3) Mother should also be advised appropriately by physician and dietician simultaneously.
- 4) The daily Calorie requirement is about 30-35 KCal per kg of body weight and additional 200 KCal should be allowed for need of the foetus. Diet should contain 50% carbohydrate, 20% protein and fat 25-30%.
- 5) Frequent blood sugar estimation is required, as urine examination for sugar is not informative.
- 6) Sonographic evaluation in pregnancy is extremely helpful to any anomalies in foetal growth and development.
- 7) It should remember the women's pre-disposition to genito-urinary infection and her need to pay particular attention to hygiene.
- 8) Woman should be made conscious with her signs and symptoms so that she will be able to take treatment in time.
- 9) Assessment of foetal well being is to be made from 32 weeks onwards.
- 10) Recording of maternal weight and examination of abdomen will help to detect polyhydramnios. Woman must be examined for any signs of diabetic complication.

- 11) Diabetes in pregnancy should be controlled to avoid hypoglycaemia or hyperglycaemia.
- 12) Special attention will be paid to problems such as nausea and vomiting. She must maintain adequate calorie intake.
- 13) Oral antidiabetic agents are not usually used during pregnancy. It is debatable whether they cause congenital abnormality but they do cross the placenta. This may lead to neonatal hypoglycaemia.
- 14) Subcutaneous insulin provides the best method of control for most women. A combination of a short and an intermediate-acting insulin is usually given twice daily. The dose must be adjusted during pregnancy as insulin requirement increases. Insulin does not cross the placenta but human insulin is preferred because antibodies are produced. Porcine and bovine insulin do cross the placenta and damage insulin producing cells of the foetal pancreas.
- 15) Diabetic women may be admitted to hospital at 34-36 weeks of pregnancy.

Early Hospitalization Facilitates :

- a) Stabilisation of diabetes.
- b) Minimise the incidence of complications like pre-eclampsia and preterm labour etc.
- c) To select the appropriate time of termination of pregnancy.

Management of Labour and Post partum

An universal guideline cannot be formulated. But the fact that majority of intrauterine deaths of the foetus occur in the last two weeks of pregnancy, the termination should be done after 37 completed weeks. Early termination will be determined by considering all the circumstances concerned in the past history as well as the present pregnancy.

During labour :

- 1) To monitor foetal condition continuously throughout labour.
- 2) A cardio-tocography is used for monitoring during labour.
- 3) A paediatrician must be present during delivery.
- 4) One litre of 5% dextrose drip is started with 10 units of soluble insulin to control diabetes.
- 5) Hourly estimations of blood glucose level should be done. Urine should be tested for sugar and acetone.
- 6) Epidural analgesia is preferred and strong sedatives and analgesics should be avoided.
- 7) 50-100 units of soluble insulin along with 10% dextrose drip and 200-400 milliequivalent sodium-bi-carbonate should be given intravenously to control ketosis.

Post Natal Care**1. Care of Mother :**

- 1) Rest in bed.
- 2) Antibiotics are given to minimize the infection.
- 3) Carbohydrate metabolism returns to normal very quickly after delivery of the placenta. The dose of insulin is reduced to half immediately after delivery. A fresh insulin regime should be made after estimation of blood glucose level.
- 4) Emphasis is laid on maintaining personal hygiene. Perineal care and frequent change of pads are extremely important.
- 5) A fresh dietetic regime should be done by the dietician.

2. Care of Baby : The baby should be kept in intensive neonatal care unit for observation for at least 48 hours and to treat effectively any complications likely to arise.

- 1) Asphyxia is anticipated and should be treated effectively.
- 2) Blood glucose should be checked after two hours of birth for all the babies.
- 3) All babies should receive vitamin "K" injection intramuscularly.
- 4) Early breast feeding is advocated.
- 5) Breast feeding should be repeated at three to four hourly intervals thereafter to minimise hypoglycaemia & hyperbilirubinaemia.

Complications**Maternal :**

i) During Pregnancy

- a) Abortion
- b) Pre-term labour
- c) Infection
- d) Pre-eclampsia
- e) Polyhydramnios
- f) Maternal distress.

ii) During Labour

- a) Increased incidence of prolonged or obstructed labour due to big baby
- b) Shoulder dystocia
- c) Perineal injuries
- d) Post Partum haemorrhage.

iii) Puerperium

- a) Puerperal sepsis
- b) Failing lactation.

Foetal :

- a) Large baby
- b) Congenital malformation
- c) Respiratory distress syndrome
- d) Hyperbilirubinaemia
- e) Polycythemia.

Heart Disease

It is one of the cause of maternal mortality, found in less than 1% amongst the hospital deliveries. Commonest cardiac lesion is of Rheumatic origin followed by the congenital one.

Classification :

- 1) Class I. No symptoms during ordinary physical activity (Asymptomatic).
- 2) Class II. Symptoms during ordinary physical activity.
- 3) Class III. Symptoms during mild physical activity.
- 4) Class IV. Symptoms at rest.

Common Signs and Symptoms of Heart Diseases During Pregnancy :

- 1) Breathlessness
- 2) Exhaustion
- 3) Cough: may or may not be
- 4) Palpitation
- 5) Rapid pulse rate

Diagnosis :

- a) Careful history to be taken.
- b) Clinical examination may be suggestive.
- c) Extrasystole, soft systolic murmur on auscultation
- d) Chest X-ray may show enlargement of the heart.
- e) ECG and Echo-cardiogram will indicate the type of heart disease.

Effects of Heart Diseases on Pregnancy

There is tendency of preterm delivery and prematurity, intra-uterine growth retardation is quite common in cyanotic heart diseases.

The cardiac failure occurs during pregnancy around 30 weeks, during labour and mostly soon after delivery.

General management

1. A woman who knows that she has cardiac disease would be wise enough to seek advice from both a cardiologist and an obstetrician before becoming pregnant so that risks of her condition may be minimised.
2. The woman should be helped to control obesity, cut down smoking and choose diet which will prevent anaemia in order to minimise risk.
3. Early diagnosis and evaluation of the functional grading of the cases.
4. To prevent, to detect, to institute effective therapy for cardiac failure.
5. To prevent and to control additional complications — risk factors as mentioned above.
6. Antenatal Care : The patient of heart disease should be cared from the beginning to the end in a well equipped hospital. The initial assessment should be made in consultation with a cardiologist.
7. Mandatory hospital delivery.
8. Therapeutic Termination (within 12 weeks of pregnancy)
 - Termination is absolute indication in the following conditions : Cases of primary pulmonary hypertension, pulmonary veno-occlusive disease.
 - Relative indications for termination of pregnancy are :
 - Antenatal woman with grade-III and IV cardiac lesions.
 - Grade-I or II with previous history of cardiac failure in early months or in mid pregnancy; Termination by hysterotomy is contraindicated.

The aim of management is to maintain or improve the physical and psychological well being of mother and foetus. This involves keeping a steady haemodynamic state and preventing complications.

Antenatal visit may be more frequent than usual, special notes in each visit to be taken are:

- a) To enquire about dyspnoea and cough.
- b) To auscultate the crepitation.
- c) To note the pulse rate — if it is 100/minute, requires hospitalisation.
- d) To look for anaemia and to note the weight and blood pressure.
- e) To re-evaluate the condition of the heart.
- f) To exclude congenital abnormality by sonography.

Avoid additional risk factors such as: urinary tract infection, upper respiratory tract

ection, anaemia, excess weight gain and smoking. Strict watch is kept on minor disorders and warning signs in pregnancy.

Advices Antenatal

- a) Adequate rest.
- b) To avoid undue excitement and strain.
- c) To avoid high calorie or spicy diet. Diet should contain low salt, less carbohydrates and fat but more protein.
- d) Anaemia to be corrected.
- e) Cold and infections are to be avoided.
- f) Adequate dental care should be taken.

Hospitalization

Type-I — At least two weeks prior to the expected date of delivery.

Type-II — At 28th weeks of pregnancy.

Type-III and IV — As soon as pregnancy is diagnosed, the woman should be kept in the hospital throughout pregnancy.

Management During Labour

- The least stressful labour for a woman with cardiac disease will be spontaneous in onset resulting in a vaginal delivery.
- Inform the anaesthetist and cardiologist on her admission into labour room.
- Prophylactic antibiotic may be given from the beginning of labour.
- Blood may be cross matched in case of need.
- Oxygen and resuscitation equipment should be available in functioning condition.
- Labour is not usually induced for uncomplicated heart disease.
- Observation of pulse and respiratory rate should be made every 15 minutes interval.
- The heart status may be monitored by ECG, fluid balance, blood pressure and foetal conditions should be carefully monitored and recorded.
- Breathlessness, cyanosis and tachycardia should be reported immediately.
- Woman will need encouragement to adopt a position in which she is comfortable.
- **Second stage** : The second stage should be short and without undue exertion on the part of the mother. Second stage may be cut short by forceps or ventouse application.
- **Third stage** : It is better to administer oxytocin in preference to ergometrine in all cases of heart disease in third stage.

Management during Puerperium

Rest is continued. Nutritional demands are to be kept in mind. During first 48 hours following delivery the heart must cope up with the extra blood from the uterine circulation and it is important to monitor the mother's condition closely during this time. 4 hourly temperature to be recorded. This will help in the early detection of infection.

The woman is nursed in upright, supported sitting position with suction apparatus. Resuscitation equipment, oxygen at hand. Analgesics may be given to reduce anxiety and pain. Injection morphine is not used during labour.

A diuretic, oxygen inhalation and prophylactic antibiotic may be necessary for caring of the mother.

The baby is examined very carefully for any sign of hereditary heart disease. Breast feeding is not contraindicated unless the woman is in heart failure.

Major Complications of Heart Disease

Cardiac failure, Pulmonary oedema, Bacterial endocarditis & Thromboemboli are major complications.

The risk of cardiac failure increases throughout pregnancy.

Signs and symptoms like cyanosis, tachycardia, oedema, abdominal discomfort, pulmonary oedema may accompany cardiac failure. Acute dyspnoea, frothy sputum, haemoptysis and pulmonary congestion should be taken care of immediately.

Management of acute heart failure and pulmonary oedema in pregnancy similar almost as in a non-pregnant woman.

Renal Diseases

Clinical Manifestations of Common Renal Diseases during Pregnancy

- The woman feels extremely unwell.
- Pyrexia and rigor may occur.
- Maternal and foetal heart rate are accelerated.
- The woman may be nauseated and may have vomitings.
- Pain and tenderness in the loin region.
- Blood values show hypoproteinaemia and varying degrees of anaemia.
- Examination of the urine shows it to be cloudy, infective organism—E. coli may be present in the urine.

Effect of Renal Problems on pregnancy and Vice-versa

With adequate renal function and with normal blood pressure, there is no adverse

effect on pregnancy, but with impaired renal function — abortion, premature labour, foetal growth retardation and intra-uterine death are likely to occur. Pre-eclampsia adversely affects the course of pregnancy.

It is very difficult to evaluate the progress of the disease due to pregnancy. There is no appreciable deterioration of renal function without pre-eclampsia. With pre-existing impaired renal function, woman may develop acute renal failure during pregnancy.

Investigation

- 1) A midstream urine should be sent for routine microscopy and culture sensitivity.
- 2) Blood values should be estimated for creatinine, sugar, urea, uric acid etc. A blood culture may be required in case of infections.

Management

- 1) Adequate rest and frequent antenatal supervision to assess impaired renal function.
- 2) Pregnancy should be continued even with mild impaired renal function. Constant monitoring for uterine activity, foetal activity and mental support are necessary.
- 3) Increase in blood urea above 60 mg or a serum creatinine above 2 mg with evidence of impaired foetal growth is an indication of urgent termination of pregnancy.

Thyroid Disorders

Thyroid function is very intimately related to the reproductive performance in women. Both hyper and hypothyroidism lead to menstrual irregularities; severe hypothyroidism commonly associated with ovulation failure and infertility. Ovulation and conception can occur with mild hypothyroidism, although the risks of abortion, stillbirth and prematurity are increased.

Pregnancy is associated with major changes in the physiology of the pituitary—thyroid axis and iodine metabolism. Thyroid gland increases by 10% in size during pregnancy in iodine replete areas and 20-40% in areas of iodine deficiency.

Effect of Pregnancy on Thyroid

Pregnancy has a goitrogenic effect on the thyroid because of the increased demand of thyroid hormones to maintain the increased maternal hormone levels and meet the requirements of the foetus. The total serum T_3 and T_4 levels increase during pregnancy by 50%. This is due to an increase in thyroxine binding globulin (TBG) which increases in early pregnancy to reach twice the non-pregnant levels by 16-20 weeks, and an increase in plasma volume. The increase in TBG occurs as a result of increased synthesis

under the influence of oestrogens and reduced clearance. The two factors together result in a considerable increase in the total T_4 pool in pregnancy, although the free hormone levels remain unchanged. To maintain a constant free T_4 level in the plasma, the production of T_4 , therefore, increases by 30-50%.

The iodine requirement during pregnancy increases by 50% due to multiple factors. Thyroid hormones are transferred to the foetus in the first trimester, and later iodine once it starts manufacturing its own thyroid hormones. The iodine excretion in the urine increases during pregnancy due to increased glomerular filtration rate and plasma clearance. Women with borderline or deficient iodine reserve, the thyroid hormone levels fall stimulating the thyroid stimulating hormone (TSH, thyrotropin). This results in thyroid enlargement and goitre formation in the mother as well as the foetus.

Effect of Iodine Deficiency on Pregnancy Outcome

Severe iodine deficiency in pregnancy leads to increase in the rate of miscarriage, stillbirth, and perinatal and infant mortality. It also has adverse effects on cognitive function of the offspring and may lead to cretinism.

Urinary iodine levels are used to assess the iodine status, though there is considerable diurnal variation. According to WHO guidelines, median urinary iodine levels for pregnant women between 149-249 $\mu\text{g/l}$ are consistent with optimal iodine intake. To prevent goitre formation, women in the reproductive age should have an adequate daily intake of iodine at least 150 $\mu\text{g/day}$ to attain normal intrathyroidal iodine stores of 10—20 mg. During pregnancy and lactation, the WHO recommends that the daily intake should be increased to 250 $\mu\text{g/day}$.

The iodine intake from the diet and dietary supplements should not exceed 500 $\mu\text{g/day}$. Certain medications like amiodarone, an anti-arrhythmic, may contain significant amount of iodine and must be prescribed carefully.

Pharmacologic doses of iodine should be avoided in pregnancy except in preparation for thyroid surgery for Graves' disease.

Laboratory Reference Values in Pregnancy

- By assessment of thyroid hormone levels.
- TSH and free T_4 (fT_4) are the two most common tests used.
- Trimester specific reference ranges for TSH and fT_4 should be ideally available.

TSH level is significantly lower in pregnancy as compared to non-pregnant women. The greatest fall occurs in the first trimester due to high levels of hCG which has a

thyrotropic effect resulting in a transient increase in free thyroxine levels. The trimester specific ranges for TSH are as follows :

- First trimester — 0.1 to 2.5 mIU/l
- Second trimester — 0.2 to 3.0 mIU/l
- Third trimester — 0.3 to 3.0 mIU/l

Subclinical Thyroid Dysfunction and Pregnancy Outcome

Subclinical hypothyroidism (SCH) is defined as serum TSH level between 2.5 and 10 mIU/L with normal fT_4 levels. Women with TSH >10 mIU/l irrespective of the free T_4 levels are considered as overt hypothyroid.

Subclinical thyroid dysfunction is identified, when the TSH levels are either above or below the normal range, but the circulating thyroid hormones (free T_3 and free T_4) are normal. SCH has been shown to be associated with adverse pregnancy outcomes and a linear increase in the risk of pregnancy loss (miscarriage, foetal and neonatal deaths), with increasing levels of maternal TSH.

Risk factors for targeted screening for subclinical hypothyroidism

- Age >30 years
- Family history of hypothyroidism or autoimmune thyroid disease
- Symptoms or signs of clinical hypothyroidism
- Presence of thyroid antibodies
- Women with type I diabetes or other autoimmune disorders
- Prior history of infertility, miscarriage, preterm delivery
- History of thyroid dysfunction

Hypothyroidism in Pregnancy

The incidence of hypothyroidism is approximately 2-3% in iodine sufficient population. The most common cause of hypothyroidism, when iodine nutrition is adequate, is autoimmune thyroid disease or Hashimoto's thyroiditis. Other causes of hypothyroidism are iodine insufficiency, previous treatment of Graves' disease by radioiodine ablation or surgery, and TSH receptor blocking antibodies.

Symptom of hypothyroidism :

- Extreme tiredness
- Trouble dealing with cold
- Muscle cramps
- Severe constipation

Problems with memory or concentration

Complications of hypothyroidism in pregnancy :

- Increased risk of miscarriages,
- Anaemia during pregnancy,
- Pre-eclampsia, abruptio placenta, and postpartum haemorrhage,
- Premature birth, low birth weight, increased neonatal respiratory distress, and more admissions to the neonatal intensive care unit.

Pre-pregnancy assessment

The thyroxine dose should be adjusted to achieve TSH levels below 2.5 mIU/l. Women with other autoimmune diseases like type I diabetes are at increased risk of developing autoimmune thyroid disease, and should be screened for anti-thyroid antibodies.

Antenatal management

Foetal thyroid starts functioning by 12-14 weeks, the foetal serum T_4 levels gradually increasing up to 18 weeks. It is vital that supplemental thyroxine and iodine should be provided from early pregnancy. When overt hypothyroidism is detected for the first time during pregnancy, levothyroxine should be initiated at a dose of 2 $\mu\text{g}/\text{kg}$ per day, and titrated according to TSH level done after 4 weeks. Therapy should be monitored by TSH levels every 4 weeks in the first half of pregnancy and once between 26 and 32 weeks. Women who are either euthyroid or have subclinical hypothyroidism (TSH $>2.5\text{mIU/L}$) but demonstrate positive TPO antibodies should be treated starting with 50 $\mu\text{g}/\text{day}$ of levothyroxine.

Postnatal management

The thyroxine requirement drops after pregnancy and the dosage of levothyroxine should be reduced to the pre-pregnancy level.

Neonatal assessment

Undiagnosed and untreated maternal hypothyroidism during pregnancy; however, has been found to correlate with lower intelligence quotients and poorer cognitive function in the offspring. Lack of thyroid hormones in the first trimester is most critical in foetal neurodevelopment.

Hyperthyroidism in Pregnancy

The commonest cause of hyperthyroidism in pregnancy is Graves' disease (90% of the cases). Other causes include multinodular goitre, toxic adenoma and thyroiditis; carcinoma, drug-induced hyperthyroidism (amiodarone) and excessive intake of thyroxine are rare.

It occurs due to excessive production of hCG in physiological conditions such as hydatidiform mole, twin pregnancy, and hyperemesis gravidarum. No specific treatment is required in these cases and the biochemical thyroid derangement resolves spontaneously once the hCG levels fall. If the serum TSH level is found to be suppressed (<0.1 mIU/l) in the first trimester, free T_4 measurement should be done in all patients.

Treatment is supportive and symptomatic. Antithyroid drugs are not indicated since the T_4 levels return to normal by 14-18 weeks of gestation.

Symptoms of Hyperthyroidism

- Irregular heartbeat
- Heightened nervousness
- Severe nausea or vomiting
- Shaking hands (slight tremor)
- Trouble in sleeping
- Weight loss or low weight gain beyond that expected of a typical pregnancy.

Complications of hyperthyroidism in pregnancy

Maternal complications include miscarriage, preterm labour, pre-eclampsia, and placental abruption. Foetal and neonatal complications include stillbirth, low birth weight, goitre, hyperthyroidism, and hypothyroidism. The risk of low birth weight babies was shown to be significantly greater in women with uncontrolled thyroid function.

Diagnosis

History and examination are important in the diagnosis of hyperthyroidism. The symptoms of hyperthyroidism like palpitations, tachycardia, irritability, heat intolerance, and fatigue may be overlooked in pregnancy as similar symptoms are often complained by normal pregnant women. Eye signs include diplopia and photophobia. Examination of thyroid should be carried out in all women with symptoms suggestive of hyperthyroidism. A diffuse swelling in the thyroid area which moves with deglutition may be due to physiological hypertrophy.

Treatment

The principal group of drugs used are thionamides which include propylthiouracil (PTU), methimazole (MMI) and carbimazole; beta blockers and iodine are the second choice drugs. Methimazole and PTU reduce the production of thyroid hormones by selectively inhibiting thyroid peroxidase.

Methimazole in doses of 10-20 mg or PTU 100-200 mg daily should be started and thyroid function repeated after 2-4 weeks initially, and 4-6 weeks after achieving the target level.

Tuberculosis

Cause : Mycobacterium tuberculosis.

Signs and Symptoms : The disease may be pre-existing and the diagnosis is made for the first time during pregnancy:

- 1) Having family history or contact history.
- 2) Chronic cough with purulent sputum.
- 3) Night sweats.
- 4) Weight loss and anorexia.
- 5) Haemoptysis.
- 6) Low grade fever.
- 7) General malaise.

Diagnosis :

- a) Detailed history about contacts and clinical features.
- b) X-rays chest.
- c) 24 hrs collection of sputum should be tested for Acid Fast Bacilli.
- d) Tuberculin test.
- e) Blood values including ESR and Hb.

Progress of the Disease During Pregnancy : The overall effect debilitates the woman with poor health status may affect the foetal growth; risks of abortion may be increased during pregnancy. The incidence of preterm labour, IUGR & perinatal mortality is high in untreated patients.

Management :

- 1) Adequate rest.
- 2) Nutritional status to be improved with high protein intake.
- 3) Regular antenatal check-up.
- 4) Anti-tubercular drugs should be started as soon as tuberculosis is diagnosed.
- 5) Usually woman is admitted for rest during the last two weeks of pregnancy.
- 6) If the woman is infectious she should be kept in a single room during her stay in hospital.

Drug	Daily dose - PO	Major side effects
Isoniazid (Pyridoxin)	5 mg / kg upto 300 mg (50 mg daily)	Hepatitis, peripheral neuropathy, hepatic enzyme elevation, hypersensitivity.
Rifampicin	10 mg / kg upto 600 mg	Nausea, vomiting, hepatitis, orange discolouration of urine and secretions, febrile reaction.
Ethambutol	15 mg/kg upto 2.5 gm	Skin rash, Optic neuritis, decreased visual activity.
Pyrazinamide	15-30 mg/kg upto 2 gm	Hepatotoxicity, skin rash, arthralgias, hyperuricemias, GI. upset.

Management during Labour

Episiotomy and forceps delivery may be advocated to reduce the strain of the second stage of labour.

Unnecessary blood loss can be avoided by careful management of third stage.

Post Natal Care

Separation of the baby from his mother is not necessary. The baby should be vaccinated with BCG (Bacilli Calmette Guerin) as early as possible.

Breast feeding is contra-indicated if the woman has an active infection and is not contraindicated when the woman is taking anti-tubercular drugs. Baby should be given prophylactic Isoniazid 10-20 mg/kg/day for 3 months when the mother is suffering from the active disease.

It should explain that poor nutrition, stress and overtiredness will encourage a recurrence of active disease. The woman should be advised to avoid further pregnancy until the disease has been quiescent for two years.

Long term disease cases need regular follow up and repeated tests to confirm that the woman is free from disease.

Jaundice

Definition

Yellow staining of the skin and sclera of eyes by abnormally high blood levels of the bile pigment bilirubin. The yellowing can also extend to other tissues and body fluids.

Causes of Jaundice during Pregnancy

A. Intercurrent jaundice in pregnancy due to medical and surgical Causes

- i) Viral hepatitis due to contaminated food and water.

- a) Infective Hepatitis.
- b) Homologous serum jaundice.
- ii) Gall stone - Obstructive jaundice due to stone is very rare in pregnancy.
- iii) Hepatotoxic drugs such as chlorpromazine, larger doses of tetracycline.
- iv) Haemolytic Jaundice - Mismatched blood transfusion and clostridium welchii infection.

B. Jaundice peculiar to pregnancy

- i) Acute fatty liver - It is very rare.
- ii) Recurrent intra hepatic cholestatic jaundice - mild jaundice and generalised pruritus develop during last weeks of pregnancy.
- iii) Pre-eclampsia and eclampsia - jaundice is very rare complication.
- iv) Hyperemesis gravidarum.
- v) Septic abortion.

Signs and Symptoms :

- 1) Onset is insidious
- 2) Generalised pruritus
- 3) Anorexia
- 4) Nausea and vomiting
- 5) Low grade fever
- 6) Fatigue

Diagnosis :

- A. History for assessing associated conditions
- B. Clinical signs and symptoms
- C. Investigations : Serum bilirubin, SGOT and SGPT, serum proteins, serum alkaline phosphate and prothrombin time.

Management

Prophylaxis : Prevention is very important especially in an antenatal period. Some of the measures are:

- 1) Improvement in sanitation, supply of safe drinking water, adequate personal hygiene are the essential prerequisites.
- 2) Use of sterilized syringe for injection.
- 3) Screening of blood donors for Hepatitis B Virus should be routinely done.
- 4) Pregnant woman exposed to a patient with Hepatitis B virus (HBV) infection should have HB immunoglobulin 0.06 ml/kg intramuscularly, immediately following exposure and a second dose after one month.

Treatment

There is no specific treatment for Viral-Hepatitis. The supportive treatment is as follows :

- 1) Rest : Complete bed rest and she should be hospitalised soon after the diagnosis.
- 2) Mother should be kept in a single room following the principles and techniques of isolation.
- 3) Nutrition : Increased amount of carbohydrate and adequate protein are to be taken. Initially glucose drink, fruit juice may be given.
- 4) Drugs : to prevent further infection oral neomycine 1 gm 6 hourly is helpful.
- 5) There is no indication for termination of pregnancy.
- 6) Prevention of complications like hypokalaemia, hypoglycaemia, hypocalcaemia etc. is done by regular blood check up. Haemorrhagic complications are managed by giving blood transfusion.
7. During Labour :
 - a) Hepato toxic drugs should be avoided, for sedation low dose paraldehyde is preferred.
 - b) Injection Vitamin-K 5 mg intramuscularly to raise prothrombin level.
 - c) Prophylactic ergometrine is to be given to prevent excessive bleeding per vagina.

Maternal Infection Affecting Foetus and Neonate

Intra uterine infection and vertical transmission to foetus (congenital infection) can occur at any time during pregnancy. Severity of infection depends on their virulence of the organism, route of infection, gestational age at infection and susceptibility of foetus. These infections result in increased perinatal mortality and morbidity and occasionally delayed symptoms and signs. Infection can be viral, protozoal, bacterial or fungal.

Viral Infections

Besides the foetus being affected, the pyrexia caused by any viral infection can cause abortion, preterm labour or start term labour pains. Viral infection can cause congenital defects, abortions, preterm births, IUGR, still births, early or late neonatal complications or even late complications due to persistence of the virus in various organs. Important viruses affecting the foetus is given below:

1. Rubella
2. Cytomegalovirus (CMV)
3. Herpes Simplex Virus (HSV)

4. Human Immunodeficiency Virus (HIV)
5. Varicella Zoster (Chickenpox Virus)
6. Hepatitis B Virus
7. Human Papilloma Virus (HPV)

Rubella

It is a RNA Virus. After an infection, the immunity acquired is long. Infection may be latent or clinically evident. The clinical features are postauricular lymphadenopathy, flu like symptoms, arthralgia or arthritis of small joints. The incubation period is 2-3 weeks. IgM antibodies appear almost with onset of symptoms and tests for one month.

If infection occurs in early pregnancy, the risk of foetal infection is very high. The pregnancy may end in abortion or the foetus may be born with congenital rubella syndrome i.e. cataract, deafness and congenital heart disease. Psychomotor retardation, foetal and neonatal growth retardation and hepatosplenomegaly may be present. Presence of IgM suggests current or recent past infection. Ig G persists life long. Mid-trimester infection in mother may cause psychomotor defects after birth like spasticity and mental retardation.

MMR vaccination at 9 months age the girl child is protected from future infection. When not sure of MMR vaccination, school girl in their teens may be vaccinated routinely against rubella. Those who have not vaccinated may be given vaccination but should avoid pregnancy for 3 months.

If no antibodies are found during pregnancy, the mother should protect herself from exposure to rubella infection and get vaccinated in the postpartum period.

Cytomegalovirus (CMV)

CMV infection causing intrauterine infection is an important infectious cause of mental retardation and congenital deafness. It is a DNA virus once infected, the virus persist in the body and cause recurrent infection. The virus is extracted through saliva, urine, cervical secretions and semen. Many women are asymptomatic during primary and recurrent infections. Primary maternal infection may present as severe fatigue, lymphadenopathy and hepatosplenomegaly. During primary maternal infection, foetus effected by vertical transmission through transplacental route. Infection can be acquired during vaginal delivery by contact with maternal secretion and during breast feeding through breast milk.

Primary infection may produce great CMV disease in the body. In this, there is hepatosplenomegaly, thrombocytopenia with petechial haemorrhage and purpura;

hepatitis with icterus, pneumonitis and chorioretinitis. Abnormal neurological findings may be microcephaly, aplesia of various parts of brain and microphthalmia. IUGR is common. Intracranial calcifications may be seen, late sequale of CMV infection is deafness, mental retardation and visual defects. In recurrent infection, because of protection by maternal antibodies, chances of baby being affected is less and sequale is also less severe.

Herpes Simplex Virus (HSV)

It is a DNA virus and like CMV has the ability to persist throughout life, with recurrent infection. Though HSV-II affect genital tract and HSV I orppharangeal areas, due to orogenital contact and contact by fingers to mouth and face, neonatal infection can occur with both HSV II and I, but infection with HSV II is more common. Adult infection may be asymptomatic or present with genital lesion. The lesions are seen in labia and other parts of vulva. Blister like lesions with interior pains are present. Other non-specific genital tract lesions are cervicitis, leucorrhoea and pelvic pain. Dysuria and/or haematuria may be present. Shedding of virus occur between one week and 3 months of appearance of lesions.

Primary infection cause abortion due to toxemia or foetal infections. Transplacental infection is not common. Primary infection after 20 weeks of gestation is associated with preterm delivery. Intrapartum infection occurs while delivering through birth passage on contact with maternal secretions containing virus. Again infection is more with primary infection. Neonatal infection can occur by contact with infected care given.

Neonatal infection is localized to skin, mouth and eyes. Babies with disseminated infection usually have symptoms of lethargy, irritant and appear between 9-11 days. This is followed by seizures, coagulopathy, heart failure, liver involvement and death.

Acyclovir is the treatment for primary or recurrent infection. It can be given during pregnancy safely though not yet fully approved. If lesions are present at the time of labour, caesarean delivery is advised, if no lesions are present, vaginal delivery is allowed.

Varicella Zoster (Chickenpox) Virus

It is a DNA virus and give life long immunity after infection. When infection occurs in a pregnant women, it causes significant maternal and foetal morbidity and mortality. The foetus is infected through transplacental route and develop congenital or neonatal chickenpox. Infection is severe in adults as compared to children. When it affects pregnant mothers, it becomes serious with development of pneumonia, which occurs 2-3 days after cutaneous lesions appear. They may develop adult respiratory distress

syndrome (ARDS). A rare complication is maternal encephalitis. Preterm labour is more common.

Congenital infection is diagnosed when the symptoms develop before 10th day after birth or when born with developmental abnormalities such as varicella embryopathy. When mother has infection in later third trimester the new born develop varicella, the infection is severe with pneumonitis, hepatitis and disseminated intravascular coagulation. Mortality is more in those babies who develop rash between 5-10 days after birth. After 10 days of birth, neonatal infection that develop is mild.

Women who are exposed to varicella infection can be protected by giving varicella zoster immunoglobulin (VZIG) in a single dose (IM) within 4 days of exposure then watch for complications. Those who develop complications are admitted in the hospital and treated with acyclovir. VZIG should also be given to newborn exposed within 5 days of delivery. Women with varicella in late 3rd trimester should be monitored for preterm labour and tocolytic drug given together if they have excessive uterine contraction to delay labour by at least 5 days after the onset of maternal lesions so that foetus is protected by maternal antibodies.

Varicella vaccine (Live attenuated virus) is contraindicated during pregnancy.

Parvovirus B₁₉

Parvovirus B₁₉ is a DNA virus. It may be asymptomatic or infection cause arthralgia in adults and may have a role in development of rheumatoid arthritis. It may also cause haemolytic anaemia. This virus is important to maternal care providing since infected mothers transmit to foetus causing non-immune hydrops foetalis. Foetal loss is higher when infection occurs before 20 weeks of gestation.

Human Papilloma Virus

It is sexually transmitted in women. Baby gets the infection during vaginal delivery while passing through infected birth canal.

In the adults, HPV causes condylomatous lesion over vulva, vagina and cervix. Neonatal infections cause laryngeal papillomas. In children having papilloma of larynx, infection was 30% of mothers. Laryngeal papillomas are caused by HPV type 6 and 11 which also cause genital infection. Maternal infection is diagnosed by southern blot hybridization, papsmear and colposcopy.

The aim of treatment is to reduce pain and bleedings, prevent secondary infection, obstructed labour and prevent infection of neonate during delivery. Topical podophyllum and 5 Fluorouracil are contraindicated in pregnancy. Surgical excision, cryosurgery and laser surgery or electrocautery is the management during pregnancy.

Acquired Immunodeficiency Syndrome (AIDS)

Cause

Acquired Immuno Deficiency Syndrome (AIDS) is caused by HIV (Human Immuno Deficiency Virus) which is a group of retro-virus HIV-1 and HIV-2.

It has become a global problem. The disease is alarmingly increasing in developing countries.

Mode of Transmission :

- 1) Sexual contact
- 2) Transplacental
- 3) Infected blood transfusion
- 4) Infected needle, syringe and instruments.

Clinical Manifestations :

- 1) Fever
- 2) Malaise, headache
- 3) Loss of weight and protracted diarrhoea
- 4) Lymphadenopathy, maculo papular rash

Effect on Pregnancy

Pregnancy has got no effect on the disease.

There is increased incidence of abortion, prematurity, intrauterine growth retardation, perinatal mortality in HIV mother.

Management

1. **Antenatal Screening** : It should be a routine for all women attending antenatal clinic and women should be given information on HIV transmission and offered serological screening on demand.
2. **Counselling** : All pregnant women need basic knowledge about the HIV and AIDS. The basic counselling of pregnant women is the responsibility of all the medical and nursing staff involved and for these skills appropriate staff education on a continuing basis is essential. Additional counselling must be offered to pregnant women for whom a positive serological test for HIV infection is obtained. Some women who have a history of "high risk" behaviour and have a negative HIV test may also benefit from additional counselling. Such counselling must include advice on safe sexual practice during pregnancy and thereafter.

In assessing and planning for antenatal care, labour and delivery of the post partum care of all women, the following points should be considered :

Antenatal Care

- 1) Wear gloves and a plastic apron when taking blood samples from all patients. Extreme care must be taken with needle and other sharp instruments.
- 2) It is not necessary to segregate women known to be infected in the antenatal period unless hemorrhage has occurred in which care may be given in a single room. However, hemorrhage in any client requires universal infection control precautions.
- 3) Pregnant woman should be encouraged to remove their own sanitary towels prior to any procedure or examination. Sanitary towels are disposed off into heavy duty yellow plastic bag for incineration.
- 4) Anti retroviral therapy to HIV-1 positive women is highly effective in reducing the viral (HIV RNA) load. Triple chemotherapy is preferred as a first line defence and to be started any time between 14 and 34 weeks and then continued throughout pregnancy, labour and postpartum period.

Anti-HIV-1 drugs are grouped into :

- A. Nucleoside analogs (Zidovudine, Zalcitabine, Lamivudine, Stavudine).
- B. Protease inhibitors (Indinavir, Saquinavir, Ritonavir)
- C. Non-nucleoside analogs (Nevirapine, Delavirdine).

Treatment regimens change frequently. However, recommended regimens (CDC-1998) are : Two from Group A plus one from either Gr. B or Gr. C. Zidovudine 100 mg given five times daily orally can reduce perinatal transmission from 25% to 7%.

Labour and Delivery

- 1) Universal infection control precautions are implemented with all women, all the time.
- 2) Any cuts or abrasions on the hand or arms of nursing & medical staff, must be covered by closed unperforated waterproof tape.
- 3) If the woman is known to be infected with HIV, foetal blood samples, intra-uterine catheter and foetal scalp electrodes should be avoided in order to reduce the risk of transmitting HIV infection to the child.
- 4) Cord should be clamped as early as possible after delivery.
- 5) Impermeable forearm protection will be required for intra-uterine manipulation (e.g. manual removal of the placenta).
- 6) After examination, the placenta should be placed in bleaching solution then in heavy-duty yellow plastic bag, which is sealed and sent for incineration. However care must be taken with all specimens from all women.
- 7) Any spillage of blood or other body fluids may be saturated with liquid disinfectant,

for example 1% sodium hypochlorite or 2% glutaraldehyde, left for 5 to 10 minutes and then carefully wiped off.

- 8) Contaminated bench surfaces or table surfaces may be wiped with 0.1% sodium hypochlorite or available fresh bleaching action.

Post Natal Care

- 1) After delivery, the health care professional who receives the infant should wear a plastic apron under a gown and gloves and should continue to wear gloves until the infant is bathed and blood is removed from the skin.
- 2) On arrival of mother in the post natal unit, the universal infection control precautions are continued.
- 3) It is not necessary to have special toilet facilities for use by mothers known to be infected with HIV. As all puerperal woman have lochial discharge and many have fresh perineal wounds, routine toilet practice in post natal wards should include flushing of toilets with adequate water and disposing off perineal pads in a proper manner. Toilets should be cleaned frequently with disinfectant.
- 4) Post natal mother may have shower bath daily.
- 5) Mother with HIV infection is allowed to breast feed the baby as alternative forms of nutrition are not safe.

Neonatal Care

- 1) Mouth-operated mucus extractors and mouth operated devices for the aspiration of blood from foetal scalp sampling must not be used. Aspiration should be done by syringe or bulb syringe or by mechanical suction apparatus attached to suction catheter.
- 2) After standard management of the cord, the infant should be cleaned with cotton in a delivery room to remove all traces of maternal blood and amniotic fluid. Care is also taken to prevent contamination of the cut cord by maternal blood or secretions during cleaning.
- 3) It is better to use disposable napkins which can be disposed off in heavy-duty yellow plastic bags.
- 4) In a routine cord care, swab must be soaked in 0.5% Chlorhexidine gluconate in 70% isopropyl alcohol, may be used on the cord stump.
- 5) The infant should be cared for in the same room of the mother and gloves must be used when dealing with nappy changes or handling discharges or vomitus.

Zidovudine syrup 2 mg/kg is given to the neonate 4 times daily for first 6 weeks of life.

Protozoal infection

Protozoal infection of mother that can cause congenital infection are :

- Toxoplasmosis—*toxoplasma gondii*
- Malaria—*plasmodia*

Toxoplasmosis

It is a protozoal infection. Cat acts as host. Infection may occur from ingestion of raw or partly cooked meat. Direct contact with contaminated infection may be asymptomatic or produce mild symptoms, such as fatigue and lymphadenopathy. Congenital transmission of parasite may occur during acquired acute maternal infection resulting in abortions, still births or congenital toxoplasmosis with characteristic cerebral calcification, chorioamnionitis, hydrocephaly or microcephaly. Infected asymptomatic neonate may develop mental retardation, visual impairment and other neurologic sequale late in life.

Acute toxoplasmosis is diagnosed by presence of Ig M antibodies and sabin Feldman sye test. Ig G antibodies persists and denotes past infection. Heating meat thoroughly during cooking prevents infection. Treatment by Spiramycin (Rovamycin) during pregnancy should be done.

Malaria

Malaria infection during pregnancy is a significant public health problem with substantial risks for the pregnant woman, her foetus, and the newborn. Malaria-associated maternal illness and low birth weight is mostly the result of *Plasmodium falciparum* infection.

The symptoms and complications of malaria in pregnancy vary according to malaria transmission intensity in the given geographical area, and the individual's level of acquired immunity.

Women of reproductive age have relatively little acquired immunity to malaria, malaria in pregnancy is associated with anaemia, an increased risk of severe malaria, and it may lead to spontaneous abortion, stillbirth, prematurity and low birth weight.

Infection with *P. vivax*, as with *P. falciparum*, leads to chronic anaemia and placental malaria infection, reducing the birth weight and increasing the risk of neonatal death. For women in their first pregnancy, the reduction in birth weight is approximately two thirds of what is associated with *P. falciparum*, but with *P. vivax* the effect appears to increase with successive pregnancies.

- WHO recommendation for the prevention and treatment of malaria during pregnancy :
- Use of long-lasting insecticidal nets
 - In all areas with moderate to high malaria transmission, intermittent preventive treatment in pregnancy with sulfadoxine-pyrimethamine (SP), as part of antenatal care services
 - Prompt diagnosis (by Rapid kit test) and effective treatment of malaria infections

Bacterial Infection

Bacterial infection in mother affecting the foetus and neonate are.

- Syphilis
- Gonococci
- Chlamydia
- Group B streptococci (GBS)

Syphilis

Syphilis is caused by a spirochete called *Treponema pallidum*. Primary, secondary, latent and tertiary syphilis are different stages of disease progressing from the beginning of infection. It is a sexually transmitted disease. The test routinely done to diagnose the disease is VDRL in both partners. A positive VDRL test has to be confirmed by fluorescent treponemal antibody absorption test (FTA-ABS) which is a specific test. Pattern of primary and secondary syphilis can be diagnosed by demonstration of organism on dark ground illumination. *T. Pallidum* can cross the placenta and infect the foetus at any time during pregnancy.

The infection can result in stillbirth, preterm labour, IUGR, foetal hydrops and congenital syphilis. Baby may have vascular bullous lesions on the skin mainly palm and soles or look healthy at birth. Symptoms and signs appear in 3-4 days after birth. Iritis, signs of meningeal irritation, rhinitis, pharyngitis, generalized lymphadenopathy and splinting of arms and legs due to arthralgia may be present. Hepato-splenomegaly with icterus may be seen. Rash appears all over the body. A symptomatic babies may develop the disease later in life. The more recent the maternal infection, the more severe the congenital disease. Severity also depends on the gestational age of foetus at the time of infection. Gradually improved obstetric performances have been seen in multigravidae. A classical history shows → late abortion → macerated still birth → fresh still birth → congenital syphilitic baby → healthy baby.

Syphilis is treated by benzathine penicillin 2.4 million units IM single dose in syphilis of less than 1 year duration and weekly for 3 doses in duration more than one year.

The infected baby with positive serological reaction should be isolated from the mother & procaine peniciline G 50,000 units/kg body weight for 10 days daily administered.

Gonococci

Gonorrhoeal infection in mother is often asymptomatic. Infection is transmitted to the baby during labour and gonococcal ophthalmia develop in 3-4 days. Routine prophylaxis against ophthalmia neonatorum is not practiced any longer. Only when symptoms and signs develop, treatment is started. Women and her partner is also treated.

Chlamydia

Chlamydia trachomatis is the causative organism and it is sexually transmitted. In non pregnant woman, it may be asymptomatic or causes symptoms and signs like frequency and burning micturition, pain and enlargement of bartholin gland and mucopurulent cervicitis. When upper genital tract is involved, it causes PID and infertility. LGV (lymphogranuloma venerum) is another type of lesion caused by chlamydia. Infected mother during vaginal delivery may transmit infection to the baby and neonatal conjunctivitis result. Pneumonia with prominent respiratory symptoms may follow in some cases. Chlamidial infection is diagnosed by Elisa test and since the test is expensive, it is not commonly done.

Group B Streptococci (GBS)

Group B Streptococci causes severe congenital infection and also chorioamnionitis, post partum endometritis, wound infection and sepsis in mother and is an important cause of intrauterine asphyxia. High risk mothers likely to transmit the infection to baby at the time of preterm rupture of membranes, preterm labour, intrapartum fever, prolonged induction and repeated pelvic examination. Early neonatal sepsis occurs and has a high mortality rate.

Universal screening of all pregnant mothers should be mandatory. Prophylactic antibiotic as ampicillin 500 mg BD till delivery for 7 days is administered to all high risk woman.

Fungal Infection

Candidiasis is caused by candida albicans and is an infection of skins, mucosa and rarely of internal organs. It is an important opportunist endogenous infection. Skin lesions are seen in folds of skin. The sites are groin, perineum, axillae and infra mammary folds where skin is macerated by perspiration. Nails may be affected when hands and feet are frequently immersed in water. Mucosal lesions are vaginitis seen frequently in pregnancy,

diabetes mellitus women on oral pills or steroid therapy, etc. During vaginal birth, the baby may acquire infection. Oral thrush follows characterized by creamy white patches on buccal mucosa and tongue.

Pregnancy Induced Hypertension

Pregnancy induced hypertension is a condition characterized by high blood pressure during pregnancy. It is one of the common complication which lead to maternal and perinatal morbidity and mortality.

Classification of PIH -

1. Gestational hypertension
2. Pre-eclampsia
3. Eclampsia
4. Chronic hypertension

Gestational Hypertension

Clinical Manifestations of Hypertension in Pregnancy

- 1) Consistent blood pressure of 140/90 mm Hg or more during the first 20 weeks of pregnancy and it persists even after 3 months.
- 2) Weak femoral pulses indicate coarctation of the aorta.
- 3) It is common in multipara women.
- 4) Urine test for proteinuria is negative.
- 5) Hypertensive retinopathy may be noticed.
- 6) Specific blood values like blood urea and creatinine levels may not show any significant changes.

Diagnosis During Pregnancy

- 1) Detailed history of the women is absolutely necessary to suspect hypertension.
- 2) ECG to be done.
- 3) Blood values like urea, creatinine, cholesterol and lipid profile to be estimated.
- 4) Urine examination for protein and sugar at regular intervals should be done.

Maternal risk of hypertension

Maternal risk is much increased in case of severe form or superimposed condition by pre-eclampsia.

Foetal Risk

- 1) Growth retardation due to chronic placental insufficiency.
- 2) There may be chances of perinatal loss in case of milder form with blood pressure less than 160/100 mm of Hg. As the blood pressure increases, chances of perinatal losses are also increased by 30%.

Principles of management

- 1) To control hypertension by bringing down B.P. to almost normal.
- 2) To prevent super imposition of pre-eclampsia.
- 3) To monitor the maternal and foetal well being.
- 4) To terminate the pregnancy at an appropriate time.

Management

- 1) Rest - It should be adequate with satisfactory sleep.
- 2) Diet - Low salt diet.
- 3) Sedation - Phenobarbitone 60 mg may be given daily after the assessment of need.
- 4) The antenatal check up should be done every two weeks of interval upto 28 weeks and thereafter weekly.
- 5) Routine antihypertensive drug is controversial. However if at all these drugs are used, strict monitoring of the mother and foetus must be assured.
- 6) Mild cases are allowed to go for spontaneous labour. In case of severe condition, pregnancy to be continued upto 37 weeks, there after pregnancy is terminated either by low rupture of membranes with oxytocin drip or by caesarean section.
- 7) Labour should be managed like pre-eclampsia.

Pre-eclampsia

Pre-eclampsia is the development of hypertension with proteinuria, oedema or both induced by pregnancy after the 20th week of gestation and sometimes earlier in presence of hydatidiform mole.

Pathophysiology

Uteroplacental arterial insufficiency causing placental ischaemia and hypoxia leads to pre-eclampsia. 'Vasospasm' is basic to the pathophysiology of pre-eclampsia. Vascular constriction causes a resistance to blood flow and accounts for the development of arterial hypertension.

Women with pre-eclampsia have an increased vascular reactivity to angiotensin II which precedes the onset of hypertension. Moreover angiotensin II appears to have a direct action on endothelial cells causing them to contract. These factors lead to inter

endothelial cell leaks through which blood constituents including platelets and fibrinogen are deposited subendothelially. The vascular changes together with local hypoxia of the surrounding tissues presumably lead to hemorrhage, necrosis and other end organ disturbances that have been observed at times with pre-eclampsia.

The pathology in pre-eclampsia is not restricted to the placenta. A number of changes occur in other systems of the body and these contribute to the clinical manifestations.

i) **Cardiovascular Changes** : There is a virtual absence of pregnancy induced hypervolemia in pre-eclampsia. The causes could be:

- Generalised vasoconstriction.
- Increased vascular permeability leading to less fluid intravascularly and marked excess extravascularly. Therefore these women are extremely sensitive to even normal blood loss at delivery.

ii) **Hematological Changes**

- Intravascular coagulation
- Thrombocytopenia
- Evidence of erythrocyte destruction in the form of hemolysis, hemoglobinuria
- Reduced antithrombin III

iii) **Endocrine Changes**

- Reduced serum angiotensin II and aldosterone.

iv) **Renal Changes**

- Diminished glomerular filtration
- Proteinuria
- Microscopic picture includes:
Glomerular capillary endothelial swelling.
Sub endothelial deposits of protein material.

v) **Hepatic changes**

- Serum liver enzyme elevation due to periportal haemorrhagic necrosis in the periphery of the liver lobule.
- Bleeding may extend beneath hepatic capsule and form a subcapsular hematoma giving rise to epigastric pain in severe pre-eclampsia.

vi) **Changes in Brain**

- Cerebral oedema, hyperemia, focal anaemia, thrombosis and hemorrhage may be seen in cases of severe pre-eclampsia.

Classification of Pre-eclampsia

A. Pregnancy Induced Hypertension (PIH) : PIH is defined as hypertension that develops as a consequence of pregnancy and regresses in postpartum.

It could be:

1. Hypertension without proteinuria or oedema.
2. Pre-eclampsia with proteinuria and/or oedema - Mild and severe.
3. Eclampsia - Pre-eclampsia with convulsion.

B. Pregnancy Aggravated Hypertension

Underlying hypertension worsened by pregnancy.

1. Superimposed pre-eclampsia
2. Superimposed eclampsia

C. Coincidental Hypertension

- Chronic underlying hypertension that antecedes pregnancy or persists postpartum.

HELLP Syndrome

This is an acronym for Haemolysis (H), Elevated Liver enzymes (EL) and Low Platelet count (L.P) ($<100,000/\text{mm}^3$). This is a rare complication of PIH (10-15%). It may be associated even with mild hypertension and proteinuria. This syndrome is manifested by nausea, vomiting, epigastric or right upper quadrant pain, along with biochemical and haematological changes. Parenchymal necrosis of liver causes elevation in hepatic enzymes (AST and ALT >70 IU/L, LDH >600 IU/L). There may be subcapsular haematoma formation (which may need CT scanning) and abnormal peripheral smear. Eventually liver may rupture to cause sudden hypotension, due to haemoperitoneum.

Clinical Features

i) Blood Pressure

- It is the most dependable sign

- If blood pressure is 140/90 mmHg or more or an increase of 30 mmHg systolic or 15 mm diastolic or 20 mmHg mean arterial pressure over baseline values on at least 2 occasions 6 or more hours apart, is diagnostic of preeclampsia.

ii) **Weight Gain** - Pre-eclampsia should be suspected if the weight gain is sudden and excessive i.e. more than 2 pounds in a week or 6 pounds in later month of pregnancy.

iii) Oedema

- Oedema over the hands and face that persists even after adequate rest may be associated with pre-eclampsia

- Dependent oedema that disappears in the morning may be associated with normal pregnancy.

iv) Proteinuria

- It is defined as 300 mg or more of urinary protein preferably albumin in 24 hours or 100 mg per dl or more in at least two random urine specimens collected 6 hours or more apart.
- Almost always it develops later than hypertension and usually later than excessive weight gain.
- Grading of proteinuria :

Trace	: 0.1 g/L
1+	: 0.3 g/L
2+	: 1 g/L
3+	: 3.0 g/L
4+	: 10 g/L
- It is a sign of worsening pre-eclampsia and if it is persistent the foetal and maternal risks are markedly increased.

Woman with severe pre-eclampsia may have the following symptoms:

1) Headache

- Usually frontal
- Not relieved by ordinary analgesics
- Severe headache usually precedes the first convulsion

2) Epigastric pain or Right hypochondriac pain

- It is symptom of severe pre-eclampsia
- It may be indicative of imminent convulsions
- It is due to stretching of liver capsule by oedema or hemorrhage

3) Visual Disturbances

- May range from slight blurring of vision to partial or complete blindness
- Occur due to ischaemia of retina or occipital cortex

4) Marked pedal oedema and vulval oedema

5) Disturbed sleep

6) Diminished urinary output

Effect of Pregnancy Induced Hypertension (PIH) on Pregnancy

On Mother :

- Eclampsia

- Abruptio Placentae
- Pulmonary oedema
- Cerebral haemorrhage
- Acute renal failure
- DIC (Disseminated Intravascular Coagulation)

On Foetus :

- IUGR
- Foetal distress
- Prematurity
- IUD (Intra Uterine Death)

Prevention of Pre-eclampsia

However, pre-eclampsia is not preventable but can be detected early by good antenatal care.

The following regime should be enforced in such a high risk group of patients for preventions of pre-eclampsia.

- Regular antenatal check up for early detection of rapid gain in weight or a tendency of rising blood pressure specially the diastolic one or rise in serum uric acid level.
- Antithrombotic agents : Low dose aspirin 60 mg daily beginning early in pregnancy in potentially high risk patients is given. It selectively reduces platelet thromboxane production. Aspirin in low doses is known to inhibit cyclo-oxygenase in platelets thereby preventing the formation of thromboxane A₂ without interfering with prostacyclin generation.
- Calcium supplementation (2 gm per day) reduces the risk of pre-eclampsia.
- Antioxidants, vitamins E and C, taking from 16-22 weeks onwards reduce the risk of pre-eclampsia. Women should be on a well balanced diet rich in protein.
- Nutritional supplementation with magnesium, zinc, fish oil, high protein and low salt diet have been tried but are of limited benefit.

Women with mild pre-eclampsia are usually asymptomatic. Thus its early detection demands careful observation at appropriate intervals.

Pregnant women should be examined every 2 weeks from the seventh month and weekly in the 9th month or more often if blood pressure rises.

At these visits the woman is weighed and careful blood pressure measurements are made. Rapid weight gain any time during the latter half of pregnancy or an upward trend

in the diastolic blood pressure, even while still in the normal range should be taken serious note of.

Management

Management of pre-eclampsia will depend upon the severity of pre-eclampsia. Pre-eclampsia is classified into mild and severe depending upon the following clinical and laboratory findings :

Abnormality	Mild	Severe
a) Clinical		
1) Diastolic B.P	< 100 mmHg	> 100 mmHg
2) Headache	Absent	Present
3) Visual disturbance	Absent	Present
4) Epigastric pain	Absent	Present
5) Oliguria	Absent	Present
b) Biochemical		
1) Proteinuria	Trace to 1+	2+ or more
2) Serum creatinine	Normal	Elevated
3) Serum uric acid	Mild elevated	Marked elevated
3) Thrombocytopenia	Absent	Present
4) Hyperbilirubinemia	Absent	Present
5) Liver enzyme elevation	Minimal	Marked
6) Foetal growth retardation	Absent	Present
7) Pulmonary oedema	Absent	Present

All the above features need not be present to classify pre-eclampsia as severe. The following examples will illustrate this:

- 1) A woman with BP of 140/90 mm Hg with severe headache would be classified as severe pre-eclampsia although the blood pressure is in the range of mild pre-eclampsia.
- 2) A diastolic blood pressure of more than 110 mmHg irrespective of the presence or absence of other clinical or biochemical parameters is classified as severe pre-eclampsia.

Management in Mild PIH

Women with BP ranging from 130/90 to 150/90 mmHg can be managed themselves if they are not willing for admission in a hospital. They should be counselled that any time BP may rise and they may develop threatening eclampsia. Hence, if they develop headache, visual disturbances such as blurring vision, double vision or blindness, has epigastric pain or oliguria, they should immediately consult in hospital.

Women with mild PIH should rest in left lateral position and their daily BP is to be checked. If there is no improvement or it has gone up, she may be admitted in hospital for BP monitoring and to ensure bed rest. Maternal and foetal conditions are monitored daily till completion of 37 weeks of gestation.

Management in Hospital

1. General management
2. Specific management
 - Drug treatment
 - Termination of pregnancy

Management of Mild Pre-eclampsia

Patients with mild pre-eclampsia need not be admitted and can be managed at home as described above.

Management of Severe Pre-eclampsia

A patient of severe pre-eclampsia or with mild pre-eclampsia who do not respond to out patient treatment needs hospitalization.

General Management

- a. An appropriate history and general physical examination followed by daily search for the development of signs and symptoms such as headache, visual disturbances, epigastric pain and rapid weight gain.
- b. Blood pressure reading every 4 hours except between midnight and morning.
- c. Abdominal girth and fundal height record.
- d. Weight measurement at admission and every 2 days thereafter.
- e. Bed rest throughout much of the day.
- f. Diet with adequate protein and calories (total calories appx. 1600 cal/day)
- g. Sodium and fluid intake should be neither limited nor forced.
- h. Urine test for protein at admission and subsequently at least every 2 days.

- i. Measurement of plasma creatinine, uric acid, hematocrit, platelets and serum liver enzymes.
- j. Serial sonography.

Symptomatic Management

a. Drug Treatment of Pregnancy Induced Hypertension

Arbitrarily the blood pressure above which medication is required has been taken as 170/110 mmHg. If in any 24 hour period two measurements reach the threshold, the treatment is started.

Drug treatment can be divided into :

1. Acute Control : A sudden rise in blood pressure requires a smooth and sustained reduction. The following drugs may be used.

- i) **Nifedipine** can be given orally or sublingually 10-20mg 12 hourly. Headache and tachycardia are the side effects.
- ii) **Hydralazine** may be given by intravenous/intramuscular route 10-25mg 12 hourly. Its onset of action is in 20-30 minutes. Side effects are headache, tachycardia, foetal distress.
- iii) **Labetalol** is a combined alpha and beta adrenergic blocking agent used in dose of 250 mg 8 hourly or 6 hourly. It lowers blood pressures smoothly and rapidly without causing headache.

2. Longer Term Control :

- i) **Methyldopa** given in a loading dose of 500-1000 mg followed by 250-750 mg four times a day can control the blood pressure within 6-12 hours. Tiredness and postural hypotension may occur. Its safety in pregnancy has been well established.
- ii) **Beta blockers** include atenolol, oxprenolol and labetalol. They have the advantage of causing fewer subjective side-effects but their safety in pregnancy is not sufficiently established.

b. Termination of Pregnancy

The cure for pre-eclampsia is delivery. In mild controlled pre-eclampsia pregnancy may be continued till 37 weeks when the foetus has a better chance of survival. Uncontrolled or severe pre-eclampsia should preferably be managed at higher centre with facilities for intensive maternal and foetal care. These women require immediate termination of pregnancy under the care of a specialist obstetrician.

Eclampsia

If a pregnant woman with pre-eclampsia is not treated properly or despite treatment continues to worsen, this may lead to eclampsia.

Definition

Eclampsia is characterised by generalized tonic clonic convulsions in addition to other features of pre-eclampsia. Eclampsia is regarded with particular concern due to its associated high maternal and foetal mortality.

Eclampsia characterised by convulsions may occur in the antenatal period (antepartum), during labour (intrapartum) or after delivery (postpartum). Eclampsia is most common in the last trimester and becomes increasingly more frequent as term approaches. Nearly all cases of post partum eclampsia develop within 24 hours of delivery.

Cause : Non specific electro encephalographic abnormalities in hypodense cortical areas that correspond to petechial hemorrhage and infarction sites.

The principal post mortem cerebral lesions are oedema, hyperemia, focal anaemia, thrombosis and haemorrhage.

Symptoms :

- Hypertension
- Proteinuria
- Headache
- Visual disturbance
- Epigastric or right upper quadrant pain

The convulsion consists of four stages:

- i) **Premonitory stage:** It begins with facial twitchings and onset of unconsciousness and lasts for about 30 seconds.
- ii) **Tonic stage:** The whole body becomes rigid in a generalized muscular contraction. This phase lasts for 15 to 20 seconds. Respiration ceases and cyanosis appears.
- iii) **Clonic stage:** All the voluntary muscles undergo alternate contraction and relaxation starting from the jaw. The tongue may be bitten and the woman may be thrown out of the bed. Blood tinged froth may exude from the mouth. This state lasts for one minute.
- iv) **Stage of coma:** Gradually the movements become less frequent and the woman lies motionless.

Throughout the seizure the woman is apneic. The breathing is resumed after a long deep inhalation. Coma follows a convulsion and may last for a few minutes or persist from one convulsion to another.

After a convulsion the respiratory rate become fast. There may be cyanosis and fever which is a poor prognostic sign. Proteinuria and oedema are almost always present. Oliguria and haemoglobinuria may also be seen.

Differential Diagnosis

- Epilepsy
- Encephalitis
- Meningitis
- Cerebral tumour
- Ruptural cerebral aneurysm and hysteria.

Management

- General care of the unconscious
- Control of convulsions
- Blood pressure control
- Delivery after control of convulsion

General Care

- a) The patient should be kept in a lateral position on a railed cot in an isolated room.
- b) Sedate with diazepam 10 mg IV, largactil 50 mg and phenargan 25 mg or morphine 15 mg or pethidine 50 mg and phenargan 25 mg.
- c) After the patient is sedated IV line is started. Total fluid intake should not exceed 2 litres in 24 hours.
- d) The air passage is to be cleared of mucus at frequent intervals with a suction catheter.
- e) A gauge is placed between the teeth to prevent tongue bite.
- f) Oxygen by mask should be given.
- g) Antibiotics like penicillin should be given to prevent infection.
- h) Bladder should be catheterised.
- i) Blood pressure, pulse and respiration to be recorded 1/2 hourly.
- j) Intake-output record to be maintained.

Control of Convulsions

- 1) **Magnesium Sulphate** : Initial dose consists of 4 gm of magnesium sulphate given

intravenously as a 20% solution at a rate not to exceed 1 gm/min. This should be followed by 10 gm of 50% solution (5 gm in each buttock) injected deeply. If convulsions persist after 15 minutes, 2 gm more may be given intravenously as a 20% solution at a rate not to exceed 1 gm/min.

Every 4 hours thereafter 5 gm of 50% solution may be injected deep intramuscularly but only after ensuring that:

- the patellar reflex is present
- respiration is not depressed

c) urine output in the previous 4 hours exceeds 100 ml. Magnesium sulphate is discontinued 24 hours after delivery.

2) Lytic Cocktail Regime : This regime is safe and simple to regulate.

Initially 25 mg chlorpromazine and 100 mg pethidine in 20 ml of 5% dextrose are given intravenously along with 50 mg chlorpromazine and 25 mg promethazine (phenargan) intramuscularly. Subsequently 25 mg phenargan and 50 mg chlorpromazine are given alternatively at 4 hourly interval upto 24 hours following the last fit. Intravenous 500 ml of 10% dextrose with 100 mg pethidine is started from the beginning at a drip rate of 20-30 drops per minute. Not more than 2 litres of dextrose and 300 mg pethidine are given in 24 hours. The pethidine drip should be continued up to 24 hours following the last fit.

3) Phenytoin Sodium (Dilantin Sodium) : This is tried in certain centres. More reports are awaited for its widespread use.

Blood Pressure Control

If the blood pressure remains more than 150/100 mmHg antihypertensives should be given. Any of the following drugs may be given :

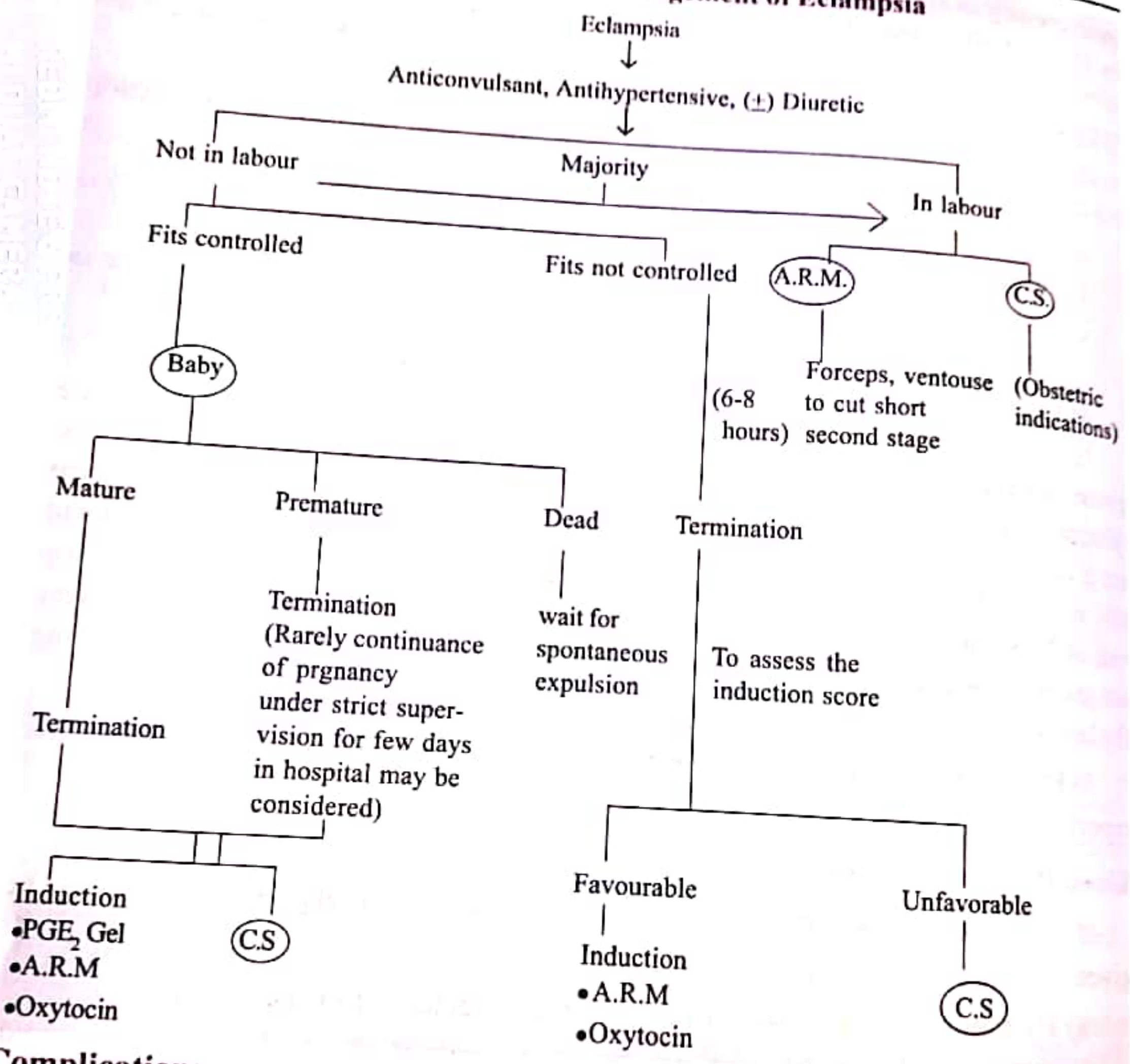
- Hydralazine 5 mg IV slowly repeated in 20 min if no response is seen.
- Nifedepine 5 mg sublingual may be given repeated after half an hour if required.

Sudden hypotension is an adverse effect which should be looked for.

Delivery after Control of Convulsion

In eclampsia, labour often starts spontaneously or can be induced successfully even if the women is remote from term. Serious morbidity is less common during puerperium in women delivered vaginally. Hence vaginal delivery is attempted and is quite often successful. The women with eclampsia lack normal pregnancy hypervolemia and are thus much less tolerant of blood loss than a normotensive pregnant woman.

Scheme of Obstetric Management of Eclampsia



Complications

Many organ system are affected in patients of eclampsia since it is a multi system disorder. The complications include the following:

- i) **Aspiration pneumonia** follows inhalation of gastric contents if vomiting accompanies convulsion and airway is not adequately maintained.
- ii) **Pulmonary oedema** may be the result of the combination of severe hypertension and vigorous intravenous fluid administration. If not treated promptly, it is associated with a poor prognosis.

- iii) **Hemiplegia** may be caused by cerebral haemorrhage.
- iv) **Coma** or altered sensorium may follow seizures. It may be caused by cerebral oedema or ruptured vessels and requires supportive management.
- v) **Blindness** may be due to retinal detachment or occipital lobe ischaemia. In either case the prognosis for return of normal vision is good and usually complete within a week.
- vi) In **Psychosis** the patient may become violent following seizures. The state may last up to two weeks and has a good prognosis.
- vii) **Renal failure** requires supportive treatment and the renal function usually returns to normal.
- viii) **Sudden death** may occur along with a convulsion or shortly thereafter usually as a result of massive cerebral haemorrhage. Pulmonary oedema is another important cause of maternal death in eclampsia.

Post Partum Care

After delivery, there is usually rapid improvement of blood pressure and proteinuria. However, the patient should be closely monitored for at least 48 hours. One must remember that convulsions may occur upto 48 hours after delivery.

Apart from the routine post partum care the following regime should be followed:

- i) Blood pressure should be checked every two hours.
- ii) Antihypertensives should be given if diastolic BP is ≥ 100 mmHg.
- iii) If patient appears restless she should be sedated.
- iv) Anti convulsant regimes if started before delivery should be continued for at least 24 hours after delivery.
- v) The dose of antihypertensive should be reduced according to BP records.
- vi) Patient should be kept in the hospital till BP is brought down to safe levels and proteinuria disappears.

Chronic Hypertension

Chronic hypertensive disease (CHD) is defined as the presence of hypertension of any cause antedating or before the 20th week of pregnancy and its presence beyond the 42 days after delivery

The high risk factors for CHD are :

- Age (>40 years)
- Duration of hypertension (>15 years)

- Level of B.P. (>160/110 mm of Hg)
- Presence of any medical disorder (reno-vascular)
- Presence of thrombophilias. Majority of women with CHD are low risk and have satisfactory maternal and foetal outcome without any antihypertensive therapy.

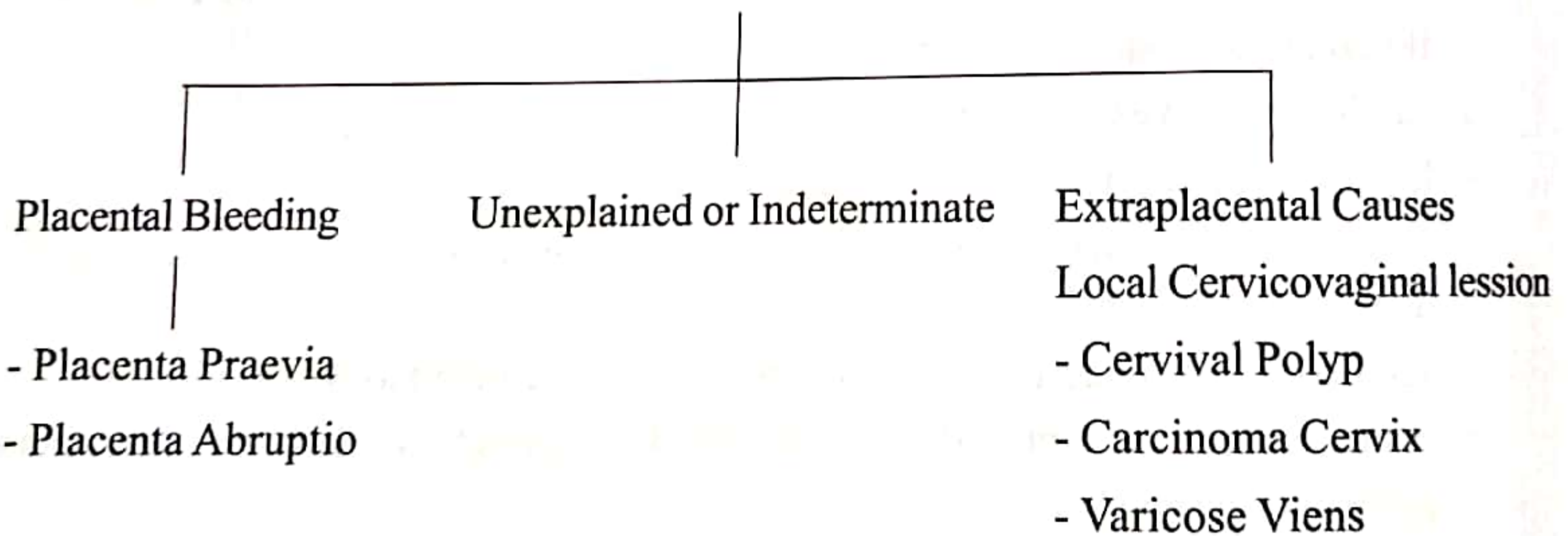
Antepartum Haemorrhage (APH)

Defenition : Antepartum haemorrhage is defined as haemorrhage from or into the genital tract after 28 weeks of pregnancy (bleeding before 28 weeks of pregnancy is called abortion) but before the birth of the baby.

Causes : Bleeding from the genital tract after 28 weeks of pregnancy can occur because of the following conditions:

- Placenta praevia
- Abruptio placentae
- Vasa praevia
- Extra placental incidental causes
- Indeterminate causes

Causes of Antepartum Haemorrhage



Placenta Praevia

Definition: When the placenta is implanted partially or completely over the lower uterine segment it is called placenta praevia.

Lower uterine segment has been defined in different ways:

Anatomical Definition: It is that part of the uterus which lies below the level at which the peritoneum on the anterior surface of the uterus ceases to be intimately applied to the uterus.

Metric Definition: It is that portion of the uterus which, towards term, lies within two inches (5 cm.) from the cervical os. It represents the distance over which the uterine cavity can be explored by the examining finger passed through the cervix during vaginal examination.

Physiological Definition: It is that part of the uterus which passively stretches in labour and takes hardly any active contractile part in the expulsion of foetus (Donald I).

Incidence : Placenta praevia occurs in about 1 in 200 deliveries. The frequency with which the zygote implants in lower part of the uterus is much higher but many of these pregnancies end in abortions. In many others the placenta migrates and comes to lie in the upper uterine segment. Only in few cases where it is implanted over the os, it persists as placenta praevia.

Aetiology : Placenta praevia is caused by implantation of the blastocyst at a site low in the uterine cavity but what causes this low implantation is not known. There are certain factors which predispose to placenta praevia and these are:

- a) **Multiparity:** Multiparity somehow predisposes to placenta praevia. The incidence of placenta praevia is much higher, about 5% in grand multipara as compared to 0.2% in nulliparous.
- b) **Advanced maternal age:** Placenta praevia is 2-3 times more common in women after 35 years as compared to women less than 20 years.
- c) **Placental Size :** Incidence of placenta praevia is higher in twin pregnancy, presumably because of large placental size.
- d) **Uterine scars and pathology:** Placenta praevia is found more commonly in cases with previous caesarean section, previous dilation and curettage, myomectomy and endometritis.
- e) **Placental pathology:** Marginal or velamentous cord insertions, succinurate lobes, bipartite placenta and fenestrated placenta are more commonly found in placenta praevia.
- f) **Smoking:** Smoking at any time increases the risk of developing placenta praevia. Compensatory placental enlargement due to carbon mono oxide hypoxaemia could be the cause.

Associated Conditions

- a) **Abnormal Placentation:** Placenta accreta and percreta may be associated with placenta praevia specially if there is a caesarean scar. The decidua is poorly developed in the lower uterine segment and therefore the placenta may get morbidly adherent to the uterus and give rise to third stage complications. .

- b) Malpresentations:** In placenta praevia the bulk of the placenta in the lower uterine segment may prevent the engagement of foetal head and predispose to malpresentation. Therefore, if high floating head breech presentation, oblique or transverse lie is present, one should suspect the possibility of placenta praevia.
- c) Congenital anomalies:** Incidence of congenital anomalies is higher in placenta praevia. The reason is not known.

Classification

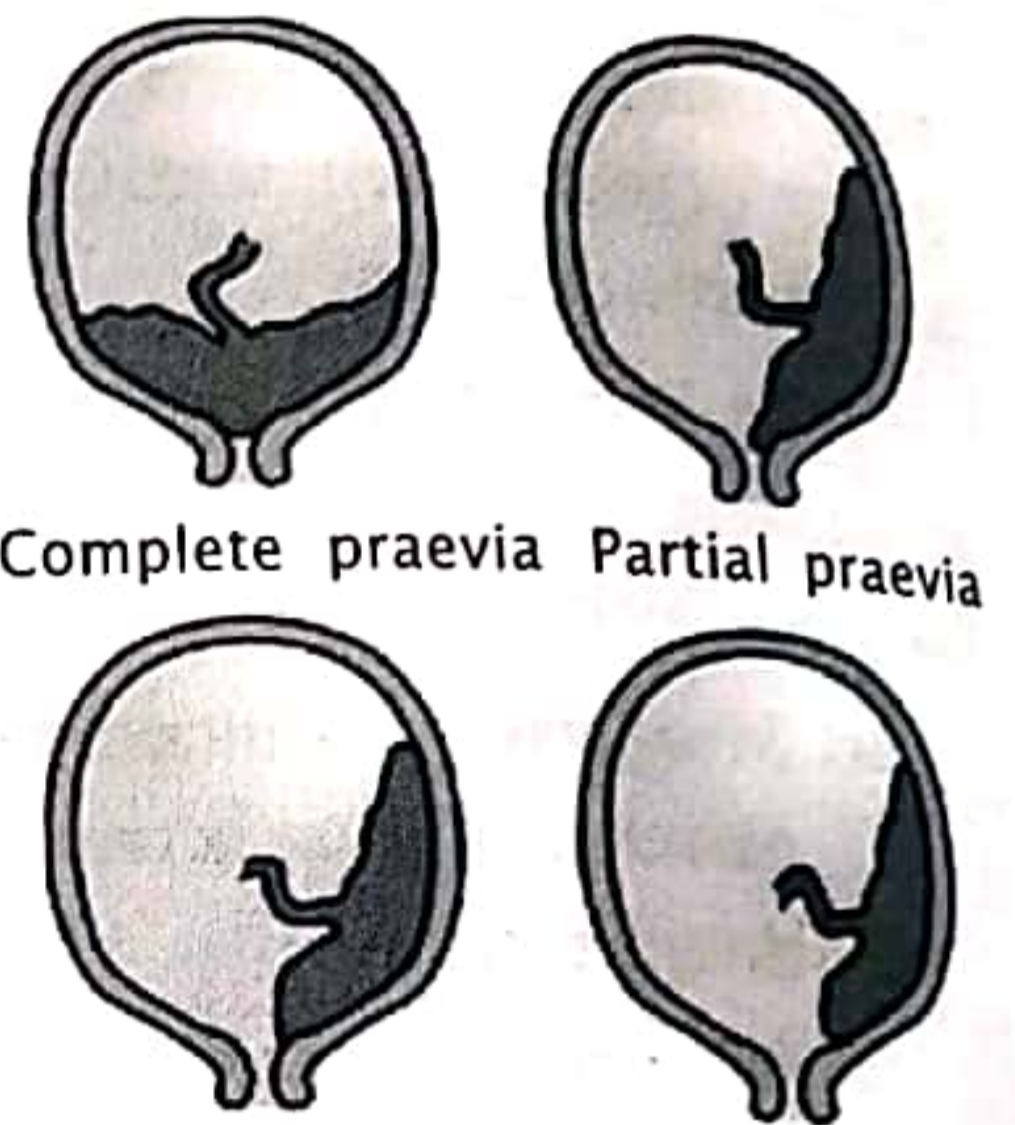
There are four types of placenta praevia depending on the degree of extension of placenta into the lower uterine segment.

Type I (Low lying placenta) : Placenta encroaches on the lower uterine segment (it lies within 5 cm of the internal os) but does not extend to the internal os.

Type II (Marginal placenta praevia): Placenta reaches the internal os but does not cover it.

Type III (Partial placenta praevia): Placenta covers the os but ceases to do so as the cervix dilates.

Type IV (Complete placenta praevia): Placenta covers the internal os even when the cervix is dilated.



Complete praevia Partial praevia

Marginal praevia Low-lying praevia

Clinical Features

Symptoms : The only symptom of placenta praevia is vaginal bleeding. The bleeding is sudden in onset, painless, apparently causeless and recurrent. The bleeding may vary from being slight to profuse. The colour of blood is bright red. The first bout of bleeding may not be alarming and it usually but not always ceases spontaneously, only to recur later. Bleeding in some cases may not occur till the onset of labour, then it may be profuse.

Signs :

- The general condition of the patient is proportionate to the amount of blood loss. If the bleeding has been profuse, all the signs of shock may be present. These include pallor, cold and clammy skin, dyspnoea, restlessness, agitation, syncope, anxiety, confusion, falling blood pressure, tachycardia and oliguria or anuria.
- On abdominal examination size of the uterus corresponds to period of gestation. Uterus is relaxed, soft and without any areas of tenderness. The foetal parts are palpable, presenting part is high up, foetus may present in oblique or transverse lie.

- Foetal heart sounds are present unless there is major degree of placental separation, hypovolaemic shock or cord accident.

Diagnosis :

- The antepartum diagnosis of placenta praevia is confirmed by transabdominal and endovaginal ultrasound.
- Vaginal examination must not be done as it can provoke further separation of placenta with torrential bleeding. Vaginal examination is done only in the operation theatre prior to termination of pregnancy. Speculum examination done after bleeding has stopped for 48 hour to exclude local cause.
- The accuracy of transabdominal ultrasound in the diagnosis of placenta praevia is excellent with false positive and false negative rates of 7 and 8% respectively. This accuracy is even higher when a vaginal probe is used. Both transabdominal and transvaginal ultrasound are safe techniques with minimal or no risk for mother and foetus.

Differential Diagnosis : Placenta praevia has to be distinguished from other causes of antepartum haemorrhage specially the abruptio placentae. The differentiating features of placenta praevia and abruptio placentae are:

Criteria	Placenta Praevia	Abruptio Placentae
Nature of bleeding	Painless, causeless and recurrent	Painful, often localised to start with and later becomes generalised, attributed to toxoemia or trauma and is continuous
General condition and anaemia	Proportionate to blood loss	Bleeding is revealed, concealed or usually mixed Out of proportion to the visible blood loss in concealed variety
Features of toxoemia	Not relevant	Present in one-third of cases
Height of uterus	Proportionate to gestational age	May be disproportionately enlarged in concealed type
Feel of uterus	Soft and relaxed	May be tense, tender and rigid
Malpresentation	Common, the head is high floating	Unrelated, the head may be engaged
Foetal heart sound	Usually present	Usually absent, specially in concealed type
Localisation of placenta	Placenta in lower segment	Placenta in upper segment
Vaginal examination	Placenta felt in lower segment	Placenta is not felt in lower segment

Management

There are two principles of management of antepartum haemorrhage:

- 1) All women with antepartum haemorrhage must be evaluated in a hospital capable of managing massive haemorrhage and with all the facilities for operative delivery.
- 2) A vaginal or rectal examination must not be performed till all preparations for immediate caesarean section and blood transfusion are available.

All cases of antepartum haemorrhage should be regarded as due to placenta praevia unless proved otherwise.

A woman who starts bleeding :

- Must be instructed to remain in bed and if she is still bleeding when first seen.
- 15 mg of morphine should be given intra muscularly and intravenous fluids should be started.
- A quick assessment of blood loss is made.
- Pulse, blood pressure is recorded and abdomen is palpated gently mainly to exclude any area of uterine tenderness or hardness suggestive of abruptio placentae.
- Fundal height is marked to detect any increase later on F.H.S. is auscultated.
- Vulva is examined for any bleeding and no vaginal examination is done.
- Blood samples are taken for haemoglobin, grouping and cross matching and coagulation studies.
- Routine urine examination for albumin and sugar is done.
- Intravenous line is established with atleast 18 gauze needle.
- In cases with preterm live foetus, with minimal bleeding expectant line of treatment is given.
- Active management of patient is done in cases where bleeding is excessive or it continues, or where foetus is mature or patient is in labour.
- Absolute bed rest is given for at least 5 days after the bleeding stops.
- Careful monitoring of pulse, blood pressure, fundal height, foetal heart sound and vaginal bleeding is done.
- Rh -ve woman should be given Anti-D immunoglobulin.
- Ultrasound examinations is done to localise placenta and to exclude any foetal malformation.
- When bleeding stops per speculum examination is done to exclude incidental causes. Anti anaemic treatment is given and patient is kept in hospital, under observation.
- Aim of expectant treatment is to continue pregnancy till 38 weeks i.e till the foetus is

Active Management

Active management is indicated in following conditions:

- 1) In cases who have been on expectant treatment and reach 38 weeks of pregnancy.
 - 2) In cases who are admitted with severe bleeding.
 - 3) Where bleeding recurs and continues with expectant management.
 - 4) Where on admission pregnancy is more than 38 weeks.
 - 5) In patients who are in labour.
 - 6) Where foetus is dead or congenitally malformed.
- In cases who have no bleeding or minimal bleeding active management includes examination of patient in operation theatre with all preparations for an immediate caesarean section and blood transfusion.
 - A gentle per speculum examination is done, if not already done, to exclude local incidental causes in the cervix and the vagina like polyps, varicose veins etc.
 - A vaginal examination is carefully done, first through the fornices and if no bogginess is felt, then finger is introduced through the os to feel for placenta.
 - If no placenta is felt, the finger is swept above the os in a concentric fashion till whole of the lower segment is explored.
 - If no placenta is felt or it is type I or type II anterior, rupture of membranes is done and patient is monitored for vaginal delivery. Oxytocin drip, if not contraindicated is given.
 - In type II posterior, type III, type IV placenta praevia or in cases where bleeding continues following rupture of membranes or foetal distress is detected caesarean section is done.
 - In cases where bleeding is excessive or there are associated factors like malpresentation a caesarean section is indicated without a prior per vaginal examination.
 - In cases with hypovolumic shock two intravenous infusions with large caliber should be established to allow rapid transfusion of blood and fluids but caesarean must not be deferred, unless, patient has already stopped bleeding when restorative measures may be carried out before starting caesarean section.
 - Lower segment caesarean section is preferred. In cases where placenta is implanted anteriorly, the placenta is separated manually to reach the margin, membranes are ruptured and baby delivered. Alternatively one may cut through the placenta and deliver the baby. In both these conditions the cord must be clamped promptly to prevent further foetal blood loss. New born must be monitored carefully and it may require blood transfusion.

Management of Third Stage

Post partum haemorrhage is common in cases of placenta praevia. Even a small amount of blood loss in third stage may lead to a shock in an already exsanguinated patient. The effects of bleeding are more marked in placenta praevia but post partum haemorrhage is most likely to occur because of following reasons:

- 1) Placental site is in lower uterine segment which does not contract and retract as efficiently as the upper segment.
- 2) Placenta is larger and thinner and may not separate completely.
- 3) Placental site is larger.
- 4) There may be morbid adhesions of placenta.

Blood should, therefore, be always available and prophylactic measures must be adopted to minimise the third stage bleeding. High dose syntocinon infusion and methergin soon after the second stage is sufficient in most cases.

Serious post partum haemorrhage should be managed with carboprost, manual uterine compression and uterine packing. If these fail, internal iliac artery ligation or hysterectomy may be required specially in cases of placenta accreta. Before hysterectomy, haemostatic sutures in the placental bed may be tried. In case the general condition of the patient is not good hysterectomy must not be delayed.

Complications

Placenta praevia is one of the most common complications of pregnancy. Maternal and foetal mortality and morbidity can be very high unless timely proper management is given to the patient.

Maternal Complications

Severe antepartum haemorrhage, shock and death may result from placenta praevia. Death may also occur as a result of intra partum and post partum haemorrhage, operative trauma or infection. Placenta accreta is a serious complication and may add to the mortality and morbidity of placenta praevia.

Foetal Complications

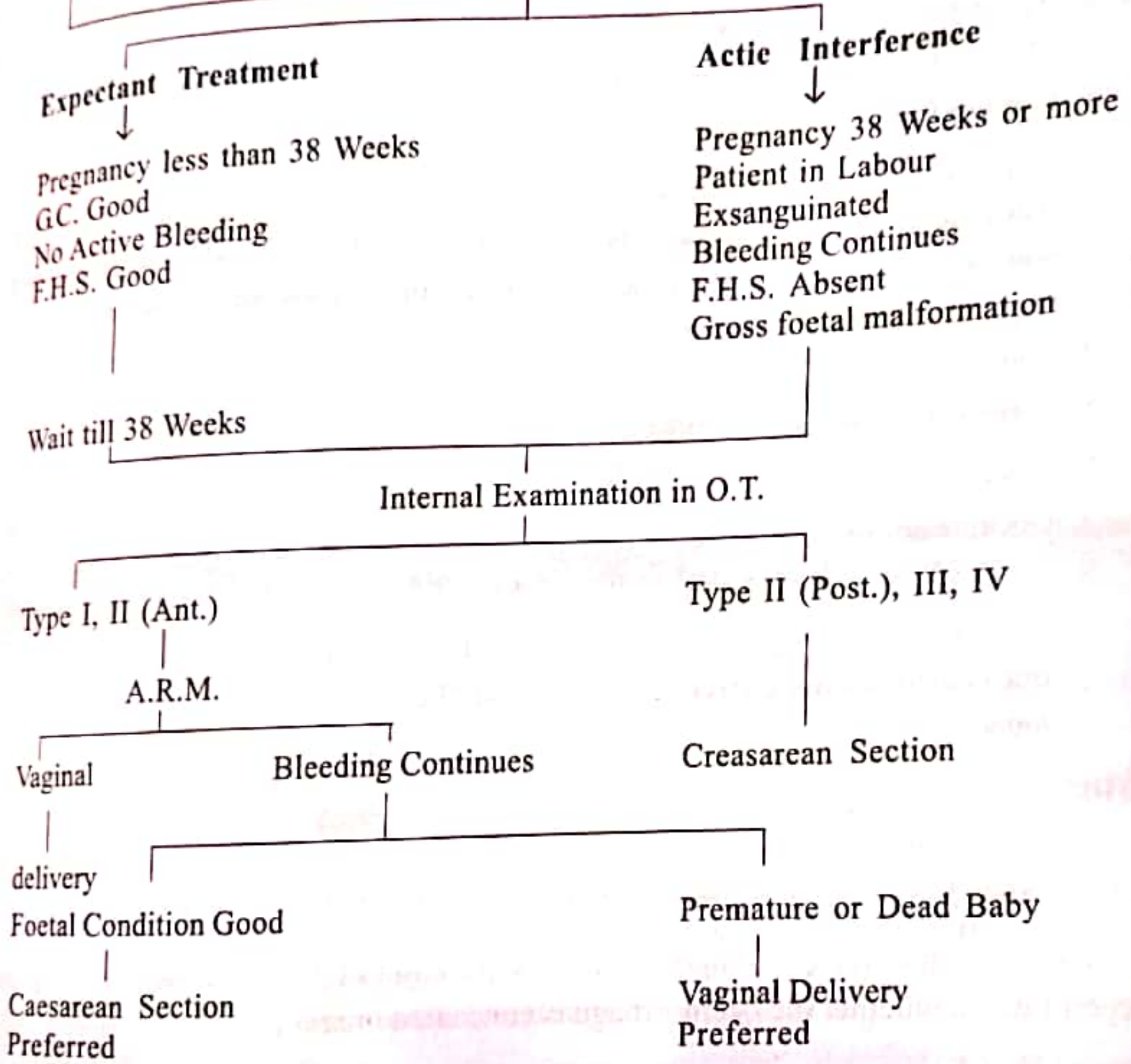
Prematurity accounts for 60% of the perinatal mortality in placenta praevia. Intrauterine asphyxia, birth injury, congenital anomaly and foetal haemorrhage are the other causes of foetal death in placenta praevia.

Prognosis

Maternal : With good management it has been shown that maternal mortality can be brought down to zero. This is achieved because of the availability of blood, timely caesarean section, safe anaesthesia and antibiotics. Good antenatal care with elimination

of anaemia and routine diagnosis of placenta praevia on ultrasound also contributes to lowered mortality.

All A.P.H. patients are to be admitted, General and Abdominal Examination, Resuscitation if Necessary, Hb, ABO Grouping and RH Typing, BT, CT, CRT, Ultrasound to be done



Foetal : The perinatal mortality inspite of the expectant management and available resources still remains high. In most of the centres it ranges from 10-20% .

Abruptio Placentae

Definition : Abruptio placentae is also known as ablatio placenta and accidental haemorrhage. Abruptio placentae is the premature separation of a normally situated placenta and accounts for 30% of cases of antepartum haemorrhage. It occurs in about 1% of deliveries, the severe form occurring in about 1 in 500 deliveries.

Aetiology

The exact cause of separation of normally situated placenta is often difficult to ascertain. Following are some of the conditions which lead to abruptio placentae:

1. External trauma—fall or blow on abdomen or external cephalic version may lead to placental separation.
2. Acute decompression of polyhydramnios—sudden diminution of surface area of uterus where placenta is attached results in placental separation.
3. Preterm rupture of membranes may lead to abruptio placentae.
 - Hypertension has been found to be the most commonly associated condition with placental separation. In severe abruption pregnancy induced or chronic hypertension was found in 50% of the cases. In milder form of abruption the incidence of hypertension is not high.
4. Short cord
5. Supine hypotension
6. Placental anomalies
7. Cocaine abuse
8. Other predisposing factors include advanced maternal age, multiparity, uterine leiomyoma, smoking and previous history of abruption. Folic acid deficiency though implicated has not proved to be the cause of abruptio. In many cases, no cause is found.

Types

1. Concealed
2. Revealed

Two principal forms of the premature separation of placenta may be recognised depending on whether the haemorrhage is concealed or revealed.

Concealed Form

This is a severe form of abruptio placentae seen in about 20% of the cases. Following the separation of the placenta, the blood does not escape out but is retained behind the placenta within the uterine cavity. Foetal death is common and coagulation disorders and other maternal complications are also more common.

Revealed Form

The blood from the separated placenta drains out through the cervix. The placenta

detachment is usually incomplete and complications are fewer and less severe. The revealed form of abruptio placentae is more common and is found in approximately 80% of the cases.

Pathology

Placental abruption is initiated by haemorrhage into the decidua basalis. As the decidual haematoma expands, it separates and compresses the placenta. The blood then separates the membranes and escapes giving rise to revealed type I abruptio placentae. In early stages there may not be any clinical features, only on inspection of the placenta after delivery a circumscribed depression with dark clotted blood is found. Recently abrupted placenta may however show no evidence of separation.

In concealed variety, the placental margins or the membranes remain adherent to the uterine wall and blood keeps collecting behind the placenta. Blood may enter the amniotic cavity after breaking through the membranes. In some cases the head which is closely applied to the cervix may prevent the blood to escape.

Clinical Features

- Vaginal bleeding is the predominant feature and is found in about 80% of the cases. Uterine tenderness and rigidity is present in most of these cases. Back pain and uterine contractions may be observed in some cases.
- Foetal distress is found in about 50% of the cases and foetal death occurs in about 15% of the cases.
- In severe forms of concealed haemorrhage no vaginal bleeding may be observed but the uterus is found to be tender and hard and foetal heart sound is usually absent.
- There may be a clinically significant amount of disseminated intra vascular coagulation associated with depletion of fibrinogen as well as other clotting factors.
- The patient may develop a haemorrhagic diathesis leading to active bleeding from all the sites.
- Hypovolaemic shock and renal failure may develop.
- Small separation of placenta may present as APH and may not produce any signs. It may be diagnosed only after delivery:

Ultra sound rarely helps in diagnosing abruptio placentae because many a times it may not reveal a retroplacental clot. Ultra sound may be helpful in excluding placenta praevia in milder forms of abruptio where clinical signs of tense and tender uterus are not present.

Couvelair Uterus (Utero Placental Apoplexy) : In the more severe form of placental abruption widespread extravasation of blood occurs into the uterine musculature and beneath the serosa giving rise to couvelair uterus which appears ecchymotic, purplish and hard and can be seen only on laparotomy. These myometrial haematomas do not interfere with uterine contractions and do not warrant hysterectomy.

Clinical Classifications

Depending upon the degree of abruption and its clinical effects the cases are graded as follows:

Grade I : Clinical features suggestive of placental separation are absent, the diagnosis is made retrospectively. Retro placental clot volume is about 150 ml. Foetus is usually not at risk.

Grade II : In this grade antepartum haemorrhage is accompanied by classic features of abruptio placentae and the foetus is alive. Retro placental clot is about 500 ml. The uterus is tense and tender and foetal heart abnormalities are present.

Grade III : Along with the features of grade II there is foetal death. It is associated with maternal shock, coagulation failure or renal failure.

Management

Management of abruptio placentae depends on the severity of the case and on the condition of the mother and the foetus.

1. Management of Severe Abruptio Placentae with Foetal Death

If the abruption of placenta is severe enough to cause foetal death the average intrapartum blood loss has been shown to be about 2500 ml. These patients, therefore, require prompt and adequate transfusion of fluids and blood. Two intravenous lines should be established to allow rapid administration of fluids and blood. Haematocrit and coagulation studies should be done. Indwelling urinary catheter should be put and vital signs monitored.

Haematocrit should be maintained at 30% or more, it sustains the oxygen carrying capacity of the patient. Urinary output of atleast 30 ml per hour signifies effective intravascular volume and acute tubular or cortical necrosis, the most common cause of maternal mortality in abruptio placentae is avoided. Central venous pressure may be monitored by putting a catheter in internal jugular vein and this should be maintained at 10cm of water. This helps in infusing correct volume of fluids. Lung bases also must be auscultated for signs of overload along with other clinical signs.

Patients with foetal death should be delivered vaginally. Amniotomy should be done as soon as possible and oxytocin drip started. Careful monitoring of vital signs, coagulation profile and urinary output is done. Oxytocin drip and uterine massage is usually sufficient to prevent post partum haemorrhage.

Cesarean section may be required if there is malpresentation, disproportion or some contraindication to vaginal delivery. Coagulation disorder, if present, must be treated before doing caesarean section.

In severe abruption acute disseminated intravascular coagulation may occur leading to fall in fibrinogen levels below 150 mg per dl. and drop in platelet count along with prolongation of partial thromboplastin time (P. T. T.) and prothrombin time (P. T.). The blood does not clot.

Normal Values for D.I.C. Profile

Test	Normal Results
B.T. (Bleeding time)	1-3 min
C.T. (Clotting time)	3-7 min
Fibrinogen	150 to 600 mg/dl
PT	11 to 16 seconds
PTT	22 to 37 seconds
Platelet count	120,000 to 350,000/cu. mm
FDP (Fibrin Degradation Products)	< 10 microgram/dl

Bedside Investigations

In absence of facilities for these tests a simple bed side clot observation test is invaluable in managing these cases. A venous blood sample is drawn and is placed in a clean dry test tube. It is observed for clot formation and clot lysis. Failure of clot formation within 5-10 minutes or dissolution of a firm clot when the tube is gently shaken at the end of an hour suggests clotting deficiency due to lack of fibrinogen and platelets. Bleeding time is also determined at bedside. The venepuncture site would be oozing if bleeding time is prolonged.

Management of Coagulopathy

Treatment of coagulopathy will depend on the amount of bleeding and anticipated route of delivery. Fresh whole blood is best for treating clotting deficiency and replacing

blood loss. Cryoprecipitates can be given as they contain all necessary coagulation factors and are free of hepatitis B virus. 10-20 units can be given. Fibrinogen deficiency usually corrects itself but if required fresh frozen plasma or fibrinogen can be transfused. Platelet transfusion in a bleeding patient is indicated if count is below 40,000 per cubic mm. and in patients with counts of 20,000 per cubic mm. even if there is no abnormal bleeding.

Coagulation defect has to be treated if caesarean section or episiotomy carried out.

Management of Renal Failure

Acute renal failure is rare with lesser degrees of placental abruption but is seen in cases when there is delayed or incomplete treatment of hypovolaemia. The possibility of renal cortical or tubular necrosis must be considered if oliguria persists after an adequate volume has been restored. An attempt should be made to improve renal circulation and promote diuresis by increasing fluid volume (under close monitoring). If renal failure persists dialysis is indicated.

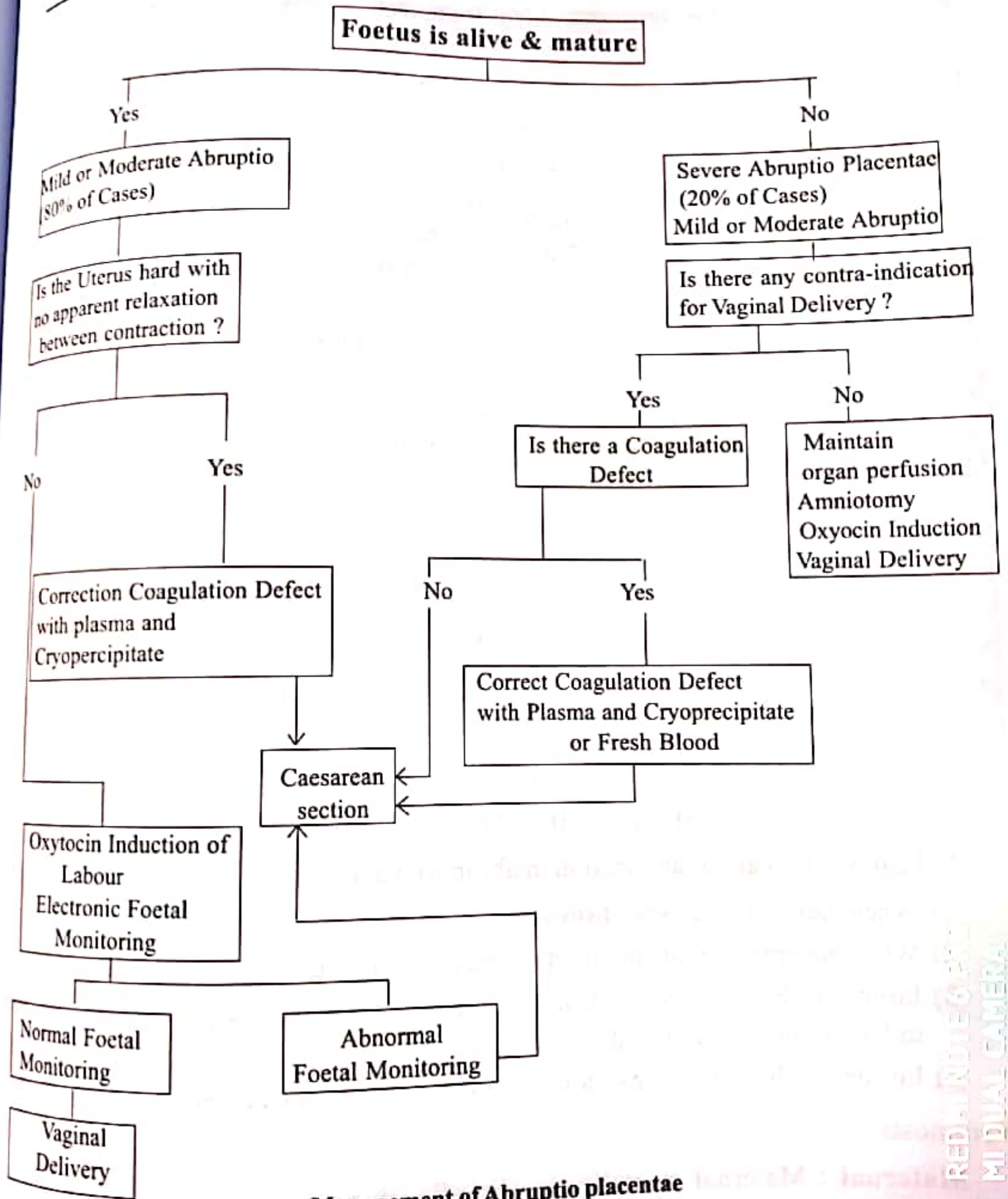
2. Management of Abruption Placentae with Live Foetus

There are two sub-groups :

- a) In hypertonic uterus - If the foetus is alive and the uterus is rigid, the abruption is large but is less than 50% chances of foetal distress are high and therefore patient should be prepared for immediate caesarean section unless there is maternal shock or pre viable foetus. Blood coagulation studies are done and blood arranged before taking the patient for caesarean section.
- 2) In soft uterus - If the uterus is soft and abruption is present, the pregnancy should be terminated by induction of labour with low rupture of membranes and oxytocin. If uterus becomes rigid and foetal distress develops caesarean section should be done.

In very mild cases of abruption placentae where foetus is preterm, expectant treatment can be given under very close supervision. Ultrasound is done for placental localisation.

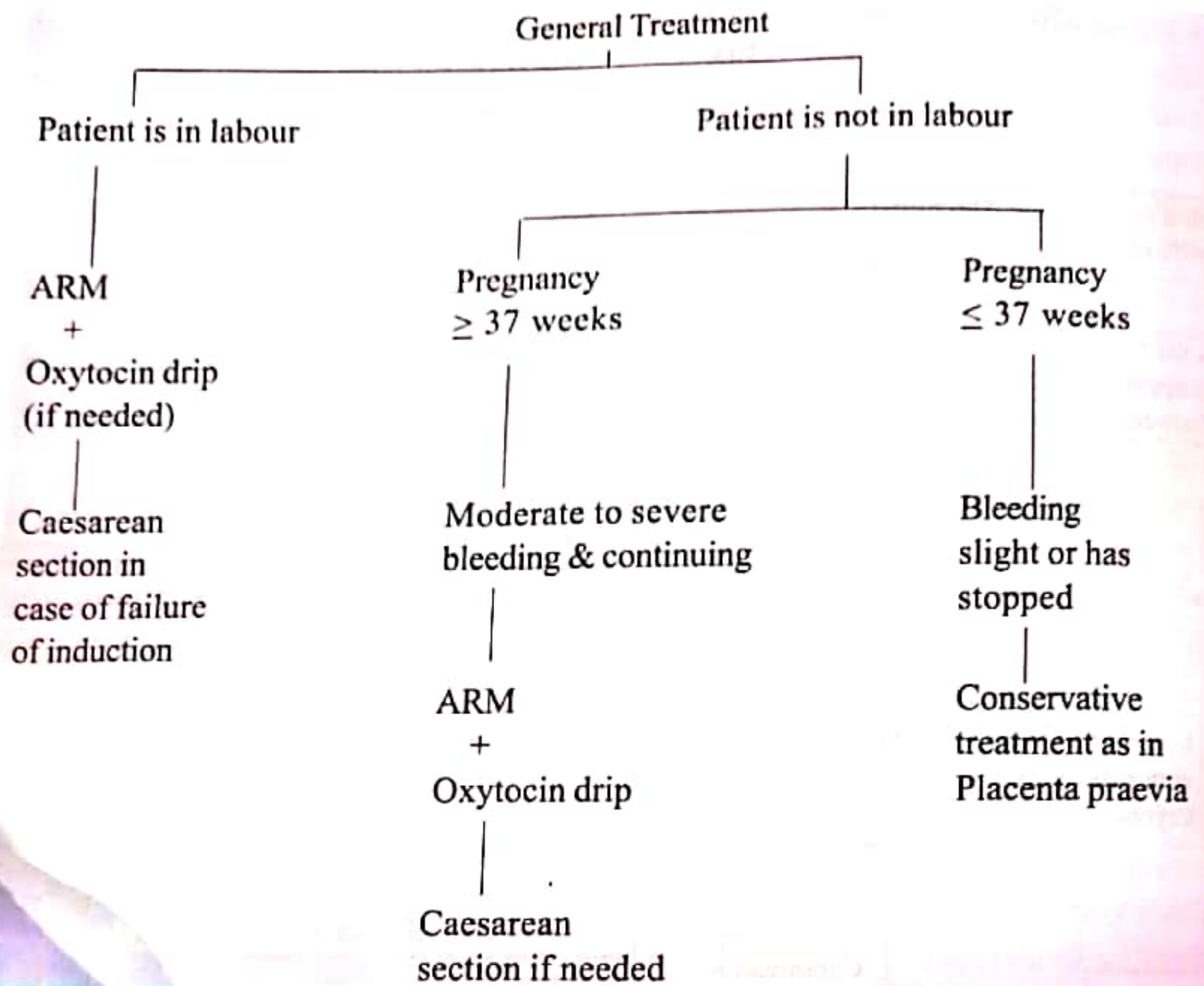
Complications are more when abruption and delivery interval is more. Hence the aim is to terminate pregnancy and deliver the foetus without delay.



Management of Abruption placentae

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Mangement of Abruptio placenta

Indications for caesareans section in abruptio placenta are:

- 1) When foetus is live, foetal distress
- 2) When maternal complication sets in they are corrected and caesarean done.
- 3) In spite of adequate blood transfusions, bleeding continues and patient's BP continues to fall or does not come up.
- 4) In spite of ARM and syntocnion drip, delivery does not take place in 12-16 hours.

Prognosis

Maternal : Maternal mortality in abruptio placentae ranges from 0.5 to 5%. Haemorrhage, D.I.C., cardiac and renal failure are responsible for high mortality. A high degree of suspicion, early diagnosis and definitive therapy results in lowered maternal mortality.

Foetal : Foetal mortality ranges from 50 to 80%. Live born infants have a high morbidity due to hypoxia, birth trauma and prematurity.

Other Causes of APH

Besides placenta praevia and abruptio placentae, antepartum haemorrhage is caused by incidental causes, marginal placenta and vasa praevia.

a) Local Lesions of Cervix : These include cervicitis, cervical erosion, polyps, varicose veins in vagina or cervix and cancer cervix. Per speculum examination will reveal these but they may coexist with other causes of antepartum haemorrhage which should, therefore, be excluded.

b) Vasa Praevia : This is a rare condition occurring in 1 in 2000-3000 deliveries. Vaginal blood tested for foetal haemoglobin in cases of APH. Caesarean section is indicated if foetal bleeding is detected.

c) In Determinate Bleeding : Many cases of antepartum haemorrhage have no evidence of placenta praevia or abruptio and speculum examination is negative. Perinatal mortality is high in this group.

The cause of bleeding in these cases is not known. It can be marginal separation of placenta or excessive show. The bleeding is usually slight. The management of these patients is expectant in pregnancy less than 38 weeks. At 38 weeks, vaginal examination is done in operation theatre and if placenta is not felt, low rupture of membranes is done, oxytocin drip is given and close foetal monitoring is required.