



## Critical Review on Garbhavkranti and Modern Embryology

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**ABSTRACT:** Sushruta samhita is one of those Ayurvedic classic which deals with human anatomy and physiology. It gives precise description of Garbha vriddhi and vikas kram in detail. The knowledge of Sharir starts from Garbha. The understanding of Garbha helps to manage healthy progeny. With the latest advancement in the field of medical science, each aspect of human embryology has been studied in detail and still more and more is being explored. This has been made possible with the help of different tools and techniques. But in the present era of scientific world one cannot put aside the thousand years old literature of ayurveda, where Acharyas have beautifully described human embryology in terms of Garbhadhan Vidhi (method of conception), maasanumasik Garbha vriddhi and other aspects of Garbha shareera (embryology) with their deep insight of knowledge even in the absence of present diagnostic tools/aids. Detailed description is available in Samhitas regarding Garbhavkranti (fertilization) and monthly development of Garbha. The present article aims to put forth the relevance of ayurveda concept of human embryology explained by Harita and by reviewing the available literature it is concluded that description given at that time holds quite true even today.

**KEYWORDS:** ayurveda, Garbhadhana vidhi, human embryology

### INTRODUCTION

The journey of human life begins in the womb, where an intricate process of development unfolds over nine months. Ancient Ayurveda meticulously documented this growth under the concept of Masanumasik Vriddhi, emphasizing the stepwise formation of different organs and physiological functions. Modern embryology, grounded in scientific observation, describes a parallel sequence of development from fertilization to birth. In Sharirsthana Acharya Sushrut has elaborated process of Garbha utpatti. He has explained characteristics of Shuddha i.e. normal Shukra (semen) and Artav (menstrual flow). Garbhavkranti is the word which literally means descent of the soul into the womb[1]

There is systematic description of foetal development which starts from Shukra-shonit sanyog i.e., fertilization. Our Acharayas has done lot of research work on garbha sharir and its chronological month wise development during antenatal period. Nowadays Advanced imaging and diagnostic techniques facilitate assessment of foetal growth and development. So it is very easy now to understand ongoing events inside uterus during antenatal period. It would be helpful to assess resemblance in Ayurvedic and modern medical viewpoint.

## MATERIAL AND METHODS

### Garbhavakrati

Garbhavakrati comprises of two words, i.e., the Garbha" and Avakrati", which literally gives an idea about descent of a dormant embodied life principle. It can be divided into three parts so that the gradual development and formation can be studied easily.

- (1) Garbha Avataran (Inception)
- (2) Garbha Nirman (Formation)
- (3) Garbha Poshana (Nourishment)

According to Indu; the commentator of Astanga Sangraha, Vayu releases during copulation, the Tejas energy of the body and this uniting with Vayu, ejects semen. This enters the female passage and combines with Artava. The embryo which develops from this is thus a combination of Soma and Agni and lodges in the uterus<sup>[2]</sup>. It is only when Jiva descends in this combination of Shukra and Artava that a foetus begins to form<sup>[3]</sup>. Jiva is called Kshetrajna and owing to its predestined union with the gross elements and the three qualities ie. Sattva, Rajas and Tamas, it becomes endowed with a character wholly divine or partly so, or demonic and impelled by Vayu, enters the uterus and stays there<sup>[4]</sup>

Samyoga of Shukra, Shonita and Jeeva inside the Kukshi is termed as Garbha. The intercourse between male and female involve Shukrachyuti, Shukra moved towards Yoni through Vata and deposits in Garbhashaya. Combination of these Shukra along with Shuddhartava forms Garbha. The fertilized ovum gets implanted in the endometrium with formation of germ layer Aahar Rasa comes from mother help Garbha to grow. The proper formation and development of Garbha depends upon the quality of Shukra, Shonita and Ritu Shadbhavas, Garbhiniparicharya, proper diet by the mother during Garbhavastha, Upasneha, Upasveda, Kala and Swabhava samsiddhi play important role in the feotal growth.

Satva & Atma are some factors also essential for the development of Garbha. Shadbhava are the factors responsible for the formation of foetus which also described by modern science such as; maternal, paternal, environmental and nutritional. Vayu, Teja, Apa, Prithvi and Akash are responsible for the stabilized structural development of body parts. Mahabhuta helps in stimulating secretion of hormones, separation of cell mass and influences transport of nutrients through umbilical cord [5-6] Charaka opinions that in the first month, atma gets mixed up or vitiated by all the dhatus (tissue) and attains a mucoid appearance. Previously due to prithvi tattva, the shape is solid Sushruta and vagbhata are of the opinion that during the first month, the embryo is in shape of Kalala. [7] As per garbhupnishad the fertilized egg becomes Kalala in one night, budbuhda in 7 nights, pinda in 15 days and solid in one month. [8]

### Masanumasik Krama According to Acharaya Shushruta<sup>[9]</sup>

**First month-** According to Ayurvedic scholars, during the first seven days Kalal is formed which is semisolid, slimy and sticky in nature. The fertilized ovum becomes Kalal and Budbuda.

**Second month-** In this month Sheeta, Ushma and Anila, guna help to turn, the Panchabhautik embryo into a compact mass called as Ghana. Garbha takes a compact form in the shape of a Pinda, Peshi or Arbuda which helps in identification of the gender. The Pinda shaped Garbha leads to the production of a Pumaan child, the Peshi shaped Garbha produces Stree child and Arbuda shaped Garbha produces Napunsak child.

**Third month-** In the third month Sarva Indriya, Sarva Angavayava manifests them simultaneously. Five buds (Pindaka) develop representing the formation of four limbs and head respectively. The Anga-Pratyanga begins to form but all are in very minute form. Development of heart and all the sense organs also starts.

**Fourth month-** In the fourth month Garbha becomes stable and dense. Due to the increase in mass, pregnant lady feel the heaviness in body. Anga, Pratyang are more prominently developed. The Sukshma forms of all body parts acquire certain form and shape. The Chetana Dhatu also gets manifested because the Hridaya becomes evident and due to this Garbha starts movements and responds to sensory stimuli.

**Fifth month-** In the fifth month mind becomes well active due to increased Mansa and Shonita during the fifth month. The Mana of fetus becomes more Sajiva. The blood and muscle tissue of the Garbha increases.

**Sixth month-** In the sixth month the development of intellect or Buddhi occurs. Development of tendons, veins, hair on the body and head, strength, colour, nails and skin occur. There is increase in Bala and Varna of the Garbha during this period.

**Seven month-** In the seventh month there is an all-round development of the Garbha occurs. Differentiation of all the Anga-Pratyangas becomes clearer. Garbha attains well developed mental and and physical form

**Eighth month-** In the eighth month of pregnancy, life is fatal for Garbha and Garbhini. Ojas travel between the mother and the child alternately through placenta and umbilical cord. Ojas are considered to be the purest form of all Dhatus, which decide the vitality, immunity and strength of the body and without it life becomes unstable

**Ninth month-** In this month full growth of foetus is completed. In Ayurveda Samhitas normal gestational period is said in be 9 to 12 months. After this period if Garbh still remains in the uterus, it is called an Garbhavikriti.

## MODERN EMBROLOGY

In modern science, the developmental anatomy is studied is the branch named "Embryology.Embryology the study embryo/foetus from the moment of its inception upto the time when it is born an infant.

### Intrauterine life of foetus can be divided into

- (1). Ovum stage- From fertilization to end of Ist week.
- (2). Embryo stage- From second to Eighth week
- (3). Foetus stage- From third month to birth

## Chronological Month Wise Development Of Foetus

### FIRST MONTH

Modern obstetrics states that at the end of first month, a fertilised egg grow within a amniotic sac Development of placenta takes place which has nutritive and excretory functions embryogenesis fertilisation development of morula takes place from embroblast. Morula contains multicellular mass and hold. Some fluid passes into the morula from the uterine cavity. As quantity of fluid increases, the morula acquires the shape of cyst. As pregnancy continues morula gets transformed into blastocyst. Blastocyst gives rise to three germ layers 1) Endoderm 2). Ectoderm 3). Mesoderm All tissues of the body are derived from one or more of these layers[11]

## **SECOND MONTH**

At sixth week, baby's heart begin to separate into four chambers and it beats about 150 times in a minute. Embryo has comparatively large head than trunk.[12] Central nervous system, sensory organs and digestive system start to develop[10], Branching of nerve cells in foetal brain results into formation of early neural pathways. Although it is not possible to confirm gender of foetus by ultrasound until after 15 weeks, his genitals begin to form at 9th week[12]

## **THIRD MONTH**

During 8-12 th week centres of ossification appear. Fingers and toes get differentiated. Development of skin, nails. and hairs takes place. Variation in external genitalia begins, [13]

## **FOURTH MONTH**

During 12-16 weeks eye movements begin which indicates maturation of midbrain<sup>[13]</sup>. The part of foetal brain responsible for complex thoughts, such as problem solving and memory starts to form at 13th week<sup>[12]</sup> Determination of foetal sex is possible as external genitalia show definitive signs of male or female<sup>[13]</sup>

## **FIFTH MONTH**

During 16-20 weeks maturation of cochlear function begins so foetus can respond to sound<sup>[13]</sup>. At 19th week foetal brain start to form separate areas which are specialized for sense of smell, test, hearing. vision and touch.

## **SIXTH MONTH**

During 20-24 weeks eyebrows and eyelashes become recognizable. Lung development almost completed. A foetus born at this time will die due to absence of terminal sacs. Development of neural pain system take place<sup>[13]</sup>

## **SEVENTH MONTH**

During 24-28 weeks skin become red and get covered with vernix caseosa. Foetus show isolated eye blinking<sup>[13]</sup>. Production of blood cells start at bone marrow at seventh month. It take place in liver and spleen before seventh month<sup>[12]</sup>

## **EIGHTH MONTH**

During 28-32 weeks Brain become more complex. Bones continue to harden. Skin become more smooth<sup>[11]</sup>. Most internal systems are well developed. Final trimester of pregnancy can bring about stressful emotions and mood swings. Hormone levels change during pregnancy which affects brain chemicals in charge of regulating moods. The first and third trimesters are the most common times for irritability and issues of mood swing<sup>[14]</sup>

## **NINTH MONTH**

During 32-36 weeks pregnancy is considered as full term. Foetus swallow lanugos hairs and vernix caséosa which result into meconium after birth. [12]

## **DISSCUSSION**

In Sharirsthana Acharya Sushrut has elaborated process of Garbha utpatti. He has explained characteristics of Shuddha i.e. normal Shukra (semen) and Artav (menstrual flow), Garbhavkranti is the word which literally means descent of the soul into the womb. the union of shukra (spermatozoa), shonita (ovum) and Ama (soul)

inside the uterus is known as garbha (embryo). The fertilization between Shukru and Shonita produces zygote which further develops into foetus. The Ritu, Kshetra and Ambu etc plays vital role in the proper development of foetus. Different components originating from five elements takes part in the formation, development of the garbha. The whole process of development of the foetus from two cells to mature foetus is called Garbhavakranti.

Ayurveda has explained month wise foetal development comprehensively, with its own principles. It is interesting fact that the details regarding month wise foetal development were noted in a period when equipments, technology of the modern science were not present. As in the first month it is a stage of kalalam or bubbuda avastha .As in the second and third month of foetal development, stability of the foetus is important or it becomes comparatively more stable. The division into the five pinda take place by akasha mahabhuta. In 8-9 weeks of foetal development sonographic study reveals that limb bud appear, Head can be seen as separate from the body. Describing the development of the foetus in the fourth month the shape and all the parts of the body is almost formed. As per the modern science palpation of the foetal body parts can be made. Foetal movements can be felt by placing the hand over uterus. Sushruta called the pregnant woman as dauhridini (with two hearts). Cravings of the pregnant woman should get fulfilled during this period. In the sixth month, Foetus acquires well developed form in physical and mental aspect. Mother looks radiant. The skin of the foetus becomes reddish and wrinkled due to the lack of underlying connective tissue. In the seventh month, the testies descend downwards. A foetus born during this period (ie. sixth or the early seventh month) has survived with great care. In the eighth month. Deposition of fat under the skin and wrinkles disappear. As per modern science skin becomes stretched and tight due to the more deposition of underlying fat. If the birth of a child takes place in this month, it is very difficult to survive. Considering each month of foetal development as per Ayurveda, many facts that Ayurveda scholars have described in their samhitas are found to be true on the basis of sonographic studies.

## CONCLUSION

Both modern embryology and Ayurveda's Masanumasik Vriddhi describe foetal development in a structured, sequential manner. Ayurveda provides an energetic and elemental understanding, while modern science offers cellular and molecular explanations. By integrating both systems, we can enhance prenatal care, disease prevention, and holistic pregnancy management. This comparison illustrates that while Ayurveda and modern science use different frameworks, they complement each other in understanding and supporting fetal growth and maternal health. Ayurvedic embryology explains. month wise foetal development along with the antenatal care of the pregnant woman which is found to be true on the basis of modern science. As we observe both viewpoints, there are some prominent similarities between Ayurvedic garbha vikas and modern foetal development. Though there were no advanced techniques, Acharyas have described a detail of foetal development which is appropriate in this era also. Every day, there are discoveries of new facts. Mother supplies the seed (ovum), bhumi (uterus) as well as nutrition through blood (rasaja and sattvaja bhava) to foetus so ayurved gives utmost importance to mother's physical and mental health. If we can understand their line of thinking and follow their path we will be able to understand Ayurveda thoroughly and go ahead following their footprints.

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