



A COMPREHENSIVE ANALYSIS OF BEEJA VIKRUTI IN GARBHA: INSIGHTS FROM TRADITIONAL INDIAN MEDICINE

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<https://doi.org/10.46607/iamj1312022024>

(Published Online: February 2024)

Open Access

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Article Received: 13/01/2024 - Peer Reviewed: 03/01/2024 - Accepted for Publication: 13/02/2024.



ABSTRACT

Introduction: *Ayurveda*, an ancient system of medicine, elucidates the process of fetal development, emphasising the union of sperm, ovum, and soul to form the fetus. Despite this intricate process, the potential for fetal defects, termed *Garbha Vikruti*, exists due to factors such as vitiation in sperm or ovum. *Ayurveda* attributes these defects to the mother's pre-conception and gestational diet, lifestyle, teratologic agents, and *Dosha* vitiation, impacting organogenesis and leading to diverse forms of *Garbha Vikruti*. The severity and timing of *Dosha* vitiation during pregnancy are critical in determining the extent of abnormalities, influencing fetal health and longevity. **Objectives:** This study explores the concepts of *Garbh Vikruti* and teratogenicity in *Ayurveda*. The research delves into the correlation between *Ayurveda's Avayava Utpatti* and Modern Organogenesis, examining sources including classical *Ayurveda* texts, journal articles, textbooks on embryology, and evidence-based research articles. **Materials and Methods:** The study synthesises information from classical *Ayurveda* texts (*Charaka Samhita*, *Sushruta Samhita*, *Kashyapa Samhita*), *Ayurveda* journal articles, embryology/anatomy textbooks, and research articles from reputable databases. The correlation between Ayurvedic and modern concepts is analysed to understand the factors causing fetal defects. **Results:** The article explores Ayurvedic concepts such as *Beeja* (gametes), *Beejabhaga* (chromosomes), *Beejabhagavayava* (genes), *Aatmakarma* (spiritual influences), *Aashaya* (uterine abnormalities), *Kaala Dosha* (temporal influences), and *Matuaaharvihara* (diet and lifestyle) as factors contributing to *Garbha Vikruti*. The study discusses the role of vitiated *Beeja*, chromosomal anomalies, genetic diseases, spir-

itual influences, uterine abnormalities, temporal factors, maternal diet and lifestyle in causing teratological malformations.

Conclusion: Fetal defects are **categorized** into genetic (*Beeja Dosha*) and metabolic (*Garbha Vighatacara Bha-va*) factors. Genetic defects include conditions like cleft lip and congenital heart defects, while metabolic defects encompass neural tube defects. The study **emphasizes** the need for a holistic approach to understanding and managing these factors, ensuring optimal fetal health and preventing future diseases. Prenatal advisors are urged to discourage the consumption of certain harmful foods, contributing to a comprehensive strategy for fetal well-being and future health.

Keywords: Ayurveda, Fetal defects, Garbha Vikruti, Teratogenicity, Modern Organogenesis

INTRODUCTION

According to *Ayurveda*, the union of the sperm, ovum, and soul forms the fetus, which grows in the uterus until birth.¹ However, during this growth, there is a possibility of defects in the fetus due to various reasons, such as vitiation in the sperm or ovum.² These defects are called *Garbha Vikruti* in Ayurvedic terms. *Ayurveda* explains that the causes of *Garbha Vikruti* can result from the mother's diet and lifestyle before and during conception, teratogenic agents or other factors that cause the vitiation of *Dosha*.² This vitiated *Dosha* affects the process of organogenesis, leading to defects in the growing fetus. *Garbha Vikruti* can occur in various forms, such as *Hina Amga*, *Pratyamga Vikruta Anga*, *Pratyanga*, and *Avayava*. According to *Ayurveda*, *Garbha Vikruti*, or fetal abnormalities, depend on the severity and timing of *Dosha* vitiation during pregnancy.² These two factors are crucial in determining the extent of *Garbha Vikruti*. If the *Dosha Prakopa*, or aggravation, is severe, there can be significant anomalies in the fetus, leading to severe defects or even fetal death or abortion. As *Dosha Prakopa's* intensity decreases, the defects in the fetus become less severe. The longevity and health of the fetus in later life depend on the extent of *Garbha Vikruti* caused by the vitiation of *Dosha* and its genetic and metabolic etiological factors. This article describes the different types of *Garbha Vikruti*, its etiological factors, and its clinical impact.

Objectives of the study:

To study the concept of *Garbh Vikruti* & teratogenicity.

Materials:

To study the correlation between *Ayurveda Avayava Utpatti* and Modern Organogenesis, as well as factors causing fetal defects or *Garbha Vikruti*, the following sources were **analyzed**:

- Classical *Ayurveda* texts such as *Charaka Samhita*, *Sushruta Samhita*, and *Kashyapa Samhita*
- *Ayurveda* journal articles and research papers
- Textbooks on embryology and anatomy
- Evidence-based research articles
- Research articles from **PubMed**, **Medknow**, Elsevier, and data search from Cochrane Database.

All the relevant information was compiled and **analyzed**.

Garbhaj Anatomical Vikritiya

According to Ayurvedic philosophy, the quality of the '*Beeja*' or the seed plays a crucial role in forming and developing a normal '*Grabha*' or fetus. If a defective '*Beeja*' is involved in **fertilization**, it may lead to anatomical abnormalities in the '*Grabha Sharir*' or fetal body structure. Such abnormalities are mainly caused by '*Beeja Dosha*' and '*Matruja Vikruti*'. Fetal anatomical deformities like a snake, scorpion, or pumpkin-like shape, dwarfism, crooked legs, and deformities in the shape of eyes can arise due to these conditions. Similarly, fetal skin may also be defective due to genetic consequences. Defects in the reproductive organs like the uterus, ovaries, and fallopian tubes can also lead to fetal anomalies.^{3,4}

Table 1: Congenital abnormalities related to the anatomical disturbances as per modern science.⁵

Major types of congenital abnormalities	Disease	Descriptions
Structural abnormalities (absence of body part or improper formation of organs)	<i>Spina bifida</i>	Improper closing of membranes and backbone around spinal cord
	<i>Hypospadias</i>	Abnormal position of bladder tube in male child
	<i>Cleft lip</i>	Abnormal gap between the upper lip
	<i>Ventricular septal defect</i>	Abnormal connection between both ventricles

Modern science has identified congenital abnormalities of limbs such as amelia and meromelia. Similarly, congenital humpback may occur due to hereditary defects in bone growth, and spina bifida is a congenital anomaly primarily caused by disturbances in anatomical development. These are some of the causes of anatomical abnormalities.

Teratogenic abnormalities⁷

According to Master *Charaka*, teratogenic abnormalities are caused by various doshas. These doshas affect the fetus's appearance, complexion, and sensory system. The abnormalities result from a combination of factors, including the abnormalities of sperms and ovum, deeds of the previous life, uterus, time factor, abnormality of menstrual cycles, and abnormalities occurring during conception time. Additionally, dietetics and the mother's mode of life, along with vitiated *Doshas*, produce these abnormalities in the fetus. The doshas that become aggravated and situated in the uterus can disfigure the fetus, just like a tree falling in a river gets disfigured due to the effect of being knocked by wood, stones, and water currents.

Sushruta further adds that congenital anomalies can also be produced due to abnormalities of semen and *Vata*, along with vitiated *Vata* located in semen. Due to the vitiation of *Vata* and nonfulfillment of desires of the pregnant woman, the fetus may become humpbacked, maim, crooked-armed, lame, and dumb, and may have a nasal voice.

In conclusion, the three leading causes for teratologic abnormalities are the atheism of parents, bad deeds of previous life, and aggravation of *Vata*. According to commentator Indu, other doshas can also cause these problems.

This article explores the concept of *Garbha Vikruti*, which is mentioned in *Veda*, *Upanishad*, and most Ayurvedic texts. In *Charak Samhita Sharira Sthana*, abnormalities of the *Beeja* (*Shukra and Shonit*), *Atma Karma* (*Purvajanmakrut karma*), *Aashaya* (*Garbhashaya*), *Kala* (specific season and time duration or abnormality of *Ritukala* meaning menstrual cycle), *Matru Ahara*, and *Vihara* (diet and lifestyle of the mother) are identified as factors that may influence the growth of the fetus.³

The following factors are responsible for causing teratological malformations and are discussed as follows:

Defects in Beeja²

Modern Ayurveda scholars have observed that though there is no direct correlation between the terms *Beeja*, *Beejabhaga*, and *Beeja Bhagavayava*, these terms can be related to gametes, chromosomes, and DNA. Abnormalities in chromosome, gene, and DNA material, which cause various somatic and gonadal anomalies in progeny or fetus, are indicated by the vitiation of *Beeja*, *Beejabhaga*, and *Beejabhagavayava*. The offspring may suffer from sexual and reproductive dysfunction due to the vitiated *Beeja*, *Beejabhaga*, and *Beejabhagavayava*, which are referred to as *Varta*, *Putipraja*, and *Trunputrika*, respectively.

Beeja: There are two types of *Beeja* - *Matruja* (female gamete or ovum or oocyte) and *Pitruja* (male gamete or sperm or spermatozoa). *Beeja* contains all the essential information required for the formation of the offspring. The genetic constitution of an organism, which the *Beeja* carries, determines various traits of an individual, such as eye colour, hair colour, height, weight, body structure, facial features,

skin colour, and so on. When either *Matruja* or *Pitruja Beeja* becomes vitiated due to a vitiated *Dosha*, it can lead to the formation of defects in the fetus. If the *Beeja* is completely vitiated, it can result in gross defects in the *Garbha* and spontaneous abortion of the *Garbha*, which is known as *Garbhasrava* or *Garbhapata*.

Beejabhaga:² According to today's *Ayurveda* scholars, chromosomes are compared to it. Chromosomes are inherited from each parent and carry hereditary information through genes. Different chromosomal anomalies and aberrations are well-established in genetics.⁸ In *Ayurveda*, these anomalies are considered different types of *jataja* and *kulaja vikara*.

Beejabhagavayava:² This text discusses the concept of genes, which are the fundamental units of heredity. Genes are responsible for expressing specific traits in individuals and are passed down from generation to generation. *Beejabhagavayava Dushti* (also known as chromosomal abnormalities) is a significant contributor to genetic diseases in individuals.² Some examples of these diseases include Sickle Cell Anemia⁹, P Thalassemia¹⁰, Duchenne's Muscular Dystrophy (DMD)¹¹, and Spinal Muscular Atrophy (SMA)¹².

Various defects can occur in organs due to genetic factors, such as agenesis, dysgenesis, or issues in forming organs like the lips, palate, tongue, and more. These defects, such as cleft lip and palate or micrognathia, can be observed at birth.

Aatmakarma:⁷ According to *Ayurveda*, spirituality and rituals are fundamental to belief in birth and re-birth, the concept of soul, and salvation. There is a belief in the deeds of previous births called *Purva-janmakrut*¹ karma of both parents and child. Sins or *Paapkarma* can affect the shape of the fetus, such as *Sarpa*, *Vrucchika*, *Kushmand*, etc. The soul undergoes a series of births and deaths based on one's own good or bad actions. Therefore, *Atmakarma* is the basis of an individual's birth.

Defects in Aashaya: According to *Ayurveda*, abnormalities in the female reproductive organs, specifically the uterus, can be considered as *Garbhashaya Dosha* in the form of *Yonivyapad*. This can be seen

in congenital abnormalities of the fetus due to defects in the uterus. In today's context, malformations of the uterus, such as unicornuate and septate uterus, along with any anatomical anomalies that prevent or hinder the average growth of the child, are considered *Ashaya Dosha*.

Kaala Dosha: There are three ways to understand the word "*Kaal*": reproductive age of parents, ovulation period (*Beejakaal*), and gestational period (*Garbhavasthakaal*). In this context, we are considering all three reasons for *Kaal Dosha*. The advanced age of both parents can be associated with congenital anomalies in the child. For example, in the majority of Down syndrome cases, non-disjunction at meiosis-I is explicitly observed in the babies of mothers over 40 years old¹³.

Matuaaharvihara:

In *Ayurveda*, *Matruja Aahara* (diet and lifestyle of mother during pregnancy) and *Vihara* (daily activities and habits) are of utmost importance in ensuring the birth of a healthy progeny. It is said that consuming *Ushana* (heat-inducing), *Tikshana* (irritating), and *Atiruksha Guna* (very dry) foods, as well as *Ati Amla* (excessively sour), *Ati Lavana* (excessively salty), and *Ati Katu Aahara* (spicy foods in excess) can be very harmful and may lead to miscarriage or premature delivery. Similarly, overexertion and excessive walking or running can also cause defects in the fetus or lead to premature delivery.

It is common for pregnant women to have cravings for unhealthy foods. However, research has found that mothers who consume junk food during pregnancy are more likely to have children with mental health problems. Researchers from Deakin University in Australia and Norway analyzed more than 23,000 mothers participating in the Norwegian Mother and Child Cohort study. The results revealed a higher occurrence of ADHD, ASD, anxiety, and depression in mothers who consumed non-nutritious and junk food during their pregnancy¹⁴.

Prenatal advisors need to discourage the consumption of certain foods and beverages that could be harmful to the developing fetus.¹⁵ These include pasteurized animal products, milk and cheese, meat-eating fish,

unwashed produce and fruit juices, raw sprouts, caffeine, alcohol, tobacco, organ meat, raw eggs, processed and canned foods, and synthetic food with preservatives. Additionally, vegetables cultivated with excess use of pesticides and **fertilizers** should also be avoided. Consumption of these items can lead to defects in the fetus and increase the risk of future diseases such as coronary artery disease, diabetes, and allergic disorders¹⁶. The International Forum for Wellbeing in Pregnancy defines the risks associated with fetal defects and risks for future diseases.¹⁷

CONCLUSION

In conclusion, this research article delves into the intricate concept of Garbha Vikruti as described in Ayurveda, shedding light on the multifaceted factors contributing to fetal abnormalities. The study explored the correlation between Ayurvedic principles and modern embryology, **emphasizing** the critical role of elements such as *Beeja*, *Aashaya*, *Kaala Dosh*, and *Matuaaharvihara* in determining the health and development of the fetus. The findings underscore the significance of the quality of the seed (*Beeja*) in shaping the anatomical structure of the fetus, with defects arising from disturbances in chromosomes and genes. The study also **emphasizes** the spiritual aspect (*Aatmakarma*) and the influence of past deeds on the formation of the fetus, connecting the realms of spirituality and embryology. Furthermore, the article highlights the impact of maternal diet and lifestyle on fetal development, **emphasizing** the need for prenatal advisors to discourage the consumption of harmful substances. Ultimately, this research provides valuable insights into the Ayurvedic perspective on **Garbha Vikruti**, offering a nuanced understanding of the intricate interplay of factors that influence fetal development. Integrating ancient wisdom with modern scientific knowledge opens avenues for further research and collaboration between traditional and contemporary medical paradigms to pursue optimal maternal and fetal health.

In summary, fetal defects can be broadly classified into two categories: those that are caused by genetic factors and those that are caused by metabolic fac-

tors. Examples of genetic defects include cleft lip, cleft palate, microglossia, and congenital heart defects, while examples of metabolic defects include neural tube defects and other types of fetal defects. Genetic defects are explained as "*Beeja Dosh*," while metabolic defects are explained under other "*Garbha Vighatakar* *Bhava*," such as maternal diet and lifestyle.

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Source of Support: Nil

Conflict of Interest: None Declared

How to cite this URL: Hemendra Kumar Verma et al: A Comprehensive Analysis of Beeja Vikruti in Garbha: Insights from Traditional Indian Medicine. *International Ayurvedic Medical Journal* {online} 2024 {cited February 2024} Available from: http://www.iamj.in/posts/images/upload/398_403.pdf