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## Concept of Genetics in Ayurveda w.s.r. to Developmental Anatomical Deformities - A Review

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### ABSTRACT

Ayurveda is science of life from thousands of years. In *Ayurveda* different concepts of genetics are described. In hereditary diseases are disease which is caused by abnormal *Shukra* and *Shonita*. Concept of *Beejbhaag* also mentioned in *Ayurveda* scientific study on genetics started since ancient time. *Doshas* dominating the *Shukra* and *Shonita* during the time of conception and also inhabiting the uterus at that time determines the *Prakriti* of the individual. The *Doshas* that ultimately emerge as dominant factors actually determine the *Prakriti*. Season also indirectly serves as one of the important factor for the determination of *Prakriti* in as much as they also aggravate *Doshas* in the *Shukra Shonita*. *Ayurveda* mentioned different diseases like *Sthaulya* (obesity), *Klaibya* (impotence), *Prameha* (diabetes) etc. which is due to defect in genetic component of a person. *Prakriti* (different types of personality) is also mentioned as concept of genetics. Present article through some glimpses on various concepts of genetics in *Ayurveda*. The modern medical science also recognizes these three terms exp:-*Adibalapravrta*, *Janmabalapravrta*, and *Kulaja*. Hereditary signifies conditions, transmitting through defects in the DNA of genes, congenital, implies the abnormalities present at birth. In this regards *Adibala Pravritta* and *Janmabala Pravritta* are categorized under the heading of *Garbhajanya Vikriti*. These mainly arise from the maternal or paternal problems and defects in progeny.

**Key words:** *Prakriti, Doshas, Shukra, Shonita, Beeja, Beejbhaag, Beejadasha, Kulaja*

### INTRODUCTION

Ayurveda has glorious history since ancient era. The two aim of *Ayurveda* are - prevention of diseases and treatment of diseases. In this regards *Ayurveda* explained several principles and conducts for healthy progeny and birth of a healthy child. The six factors

described as *Shadgarbhkarabhavas* play important role in healthy progeny and normal child birth. The avoidance or defects in *Matrija, Pitrija, Aatmaja, Rasaja, Satmyaja* and *Sattvaja* factors may leads birth defects or anatomical abnormalities.

Hereditary diseases are classified as *Matruja* and *Pitruja*. Concept of *Beejbhaag* also mentioned in *Ayurveda* scientific study on genetics started since ancient time. Although our ancient literature dose not implicate the pure and literary aspect of it in much detail but had an elementary knowledge of it in applied aspect of life rather than literally in the field of *Shruti Utpatti, Prakriti*, inheritance of characters one or more of the two *Doshas*, which are dominantly associated with the above mentioned factors. *Doshas* dominating the *Shukra* and *Shonita* during the time of conception and also inhabiting the uterus at that time determines the *Prakriti* of the individual. Food and regimens of the

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mother, which aggravates *Doshas* at that time, also determine the physical constitution. The *Doshas* that ultimately emerge as dominant factors actually determine the *Prakriti*. Season also indirectly serves as one of the important factors for the determination of *Prakriti* in as much as they also aggravate *Doshas* in the *Shukra Shonita*.

*Ayurveda* texts have given a detailed description of etiology of various malformation found in the fetus. The concept of hereditary (*Sahaj* or *Adibalapravrta*), congenital (*Garbhaja* or *Janmabalapravrta*) and familial (*Kulaja*) diseases were clear. Seed parts (chromosomes) in the seed (*Shukra Shonita*) has been described. The exact specificity of seed part (genes) and their effect has also been considered.

The modern medical science also recognizes these three terms exp:-*Adibalapravrta*, *Janmabalapravrta*, and *kulaja*. Hereditary signifies conditions, transmitting through defects in the DNA of genes, congenital, implies the abnormalities present at birth, but not necessarily transmitted through genes, where as familiar denotes that the disease may be present in many members of the family.

The improper physical, mental and social conducts during pregnancy, environmental factors and genetic factors, etc. may leads unhealthy or defective child birth. The *Ayurveda* stream of "*Sharir Rachana*" described many anatomical perspectives of body including disease related to the anatomical abnormalities or birth defects. The vitiation in *Beeja* & *Beejabhag* causes anatomical abnormalities.<sup>[1,2,3,4]</sup>

Common anatomical defects are-

- Structural defects in organ
- Absence of organ.
- Extra development of tissues or organ.
- Anatomical variations.
- Improper development of baby or fetus.

In *Ayurveda* this developmental disorder are known as *Garbhaja Vikrati*. *Garbhaja Vikrati* is one of the worst aspects of pregnancy presenting a malformed alive fetus. Due to innate or acquired factors like

chromosomal errors (*Beejabhagavikriti*) or medications during pregnancy, infections etc. The description of *Garbhaja Vikrati* is scattered in the *Ayurvedic Samhitas*. The prevalence of these congenital anomalies have increased in this era may be due to environmental factors, changed lifestyle, dietary factors and various new teratogenic drugs and infections. So before knowing to *Garbhaja Vikrati* are necessary to know about *Garbha* and *Garbha* development.

### Normal Development of *Garbha*

***Garbha*:** *Acharya Charaka* says that the *Samyoga* of *Shukra*, *Shonita* and *Jeeva (Atma)* inside the *Kukshi* is named as *Garbha*.<sup>[1]</sup> According to *Maharshi Sushrut* - a combined state of *Shukra* and *Shonita* in the *Garbhashaya*, intermixed with the *Prakritis (Mula-Prakriti* along with its eight categories) and *Vikaras* (her sixteen modifications) and ridden in by the *Atma* is called *Garbha*.<sup>[2]</sup>

***Garbha Dharana*:** When unimpaired *Shukra* and unimpaired *Shonita* unite in pure womb and lying pure genital tract. Then this definitely results in the formation of *Garbha*. This is like to transformation of milk into curd after abandoning its previous from just by the addition of a few drops of curds.<sup>[3]</sup>

***Shukra*:** The wise call it as '*Shukra*' which is implanted for the origin of *Garbha*. It is constituted of four quarters of *Vayu*, *Agni*, *Prithvi* and *Ap* (Four *Mahabhutas*) and is originated from six *Rasas*.<sup>[4]</sup>

***Raja/ Artava*:** The menstrual blood in women is produced by *Rasa (Dhatu)*, and *Rakta* named as *Raja* is formed.<sup>[5]</sup>

***Garbhadhana*:** *Sushruta* opines that the *Teja* or heat generated at the time of coitus activates *Vayu*, then the *Shukra* excreted due to the action of both *Vayu* and *Teja* reaches *Yoni* gets mixed up with *Artava*, thus formed *Garbha*.<sup>[6]</sup>

**Process of *Garbhadhana*:** During the coitus after *Shukrachyuti* (ejaculation), *Vata* carries *Shukra* through *Yoni* and deposits it in *Garbhashaya*. This *Shukra* unite with *Shuddhartava* and forms *Garbha*.<sup>[7]</sup>

**Garbha Sambhav Samagri:** Acharya Sushruta says - Four factors i.e., "Ritu" (menstrual period) "Kshetra" (uterus) "Ambu" (Ahara Rasa) & "Beeja" (Shukra and Shonita) are the essential raw ingredients for the production of Garbha, provided Beeja (Shukra and Shonita) should be pure.

In Ayurveda development of fetus is known as Garbhavakrant.

In Ayurvedic science Shadbhavas have important contribution in the development of Garbha. These Shadbhavas as described by Acharya Charaka, Sushruta and Kashyap are Matrija, Pitrija, Atmaja, Satmyaja, Satvaja, and Rasaja. Maharshi Charaka says that the following factors help in the growth of the Garbha in the Kukshi of the mother;

1. Satbhava Sampat
2. Upasneha and Upasweda
3. Ahara, Vihara of mother
4. Kala Parinama
5. Svabhava

### Garbha Vikriti

Abnormality of fetus in intra uterine life due to defects of gene, the self, past deeds, uterus, time and mother's food and behavior; the vitiated Doshas produce various abnormalities in shape, complexion and sense organs.<sup>[8]</sup>

Charakas view of congenital abnormality are due to specific morbid condition of Beeja (sperm and ovum), Atmakarma (deeds of previous life), Ashaya (uterus), Kala (time factors), and Matuaharvihar (diet and regimen of mother). Beeja is further elaborated as Beeja Bhaga and Beeja Bhagabayava. Their abnormalities collectively indicate abnormality of chromosome, gene, and DNA material which causes morbidity in different ways.<sup>[9]</sup> Atmakarma is included in this category which exhibit vulnerability of one's unknown chance for susceptibility of environmental factors.

According to Susruta birth defects are due to Adibala and Janmabala. Adibala is due to Matrija (maternal)

and Pitrija (paternal), and Janmabala is due to Rasakrita (dietary indiscretion) and Dauhrida Bimanan.<sup>[10]</sup> Vagbhata mentioned Sahaja and Garbhaja in this context.<sup>[11]</sup> The Adibala and Sahaja exhibit genetic abnormality due to autosomal dominant, autosomal recessive and sex link dominant while abnormalities cause by Janmabala and Garbhaja are due to morbid nature of diet and regiments of mother during gestational period. Abnormalities due to excessive unrighteous behavior of the mother causes congenital malformation,<sup>[12]</sup> where fetus exhibit characters like - Sarpa (snake), Vrishchika (scorpion), Kusmanda (field of pumpkin) etc. which indicate monster, found in conjoined twin (specifically in monozygotic monochorionic monoamniotic) and parasite twin. Associating parasite limbs are also can be understood under this heading. Some other disorder are caused by Dauhrida Bimanan like Kubja, Kudi, Pangu, Muka & Minmin etc.<sup>[13]</sup>

### Aanuvaanshika Vikriti of Garbha

Hereditary abnormalities depend upon the condition of Beeja, not on the physical status of couple. Or in other words what-so-ever part of Beeja is defective; the body part developing from that portion of Beeja will be abnormal.<sup>[14]</sup> Charaka mentioned Sandi Yonivyapat which occurs due to Beejadosa.<sup>[15]</sup> Vandhyaa occurs due to abnormality in Beejabhaga. Trinaputrika occur due to abnormality in Beejabhagabayava and Beejabhaga.<sup>[16]</sup> In modern trisomy, clinofliter syndrome, down syndrome etc.

According to Acharya Bhavamishra has described Dohsa Vishistha Ahara which led to produce abnormality in foetus<sup>[17]</sup>

SN	Pregnant women consuming Doshas vitiating diet	Effect on Progeny
1.	Vata Dosh	Dumb, hoarse or nasal voice, lame, dwarf, number of body parts.
2.	Pitta Dosh	Baldness, premature graying of hairs, absence of hairs on

		face, tawny colour of skin, hair and nail.
3.	<i>Kapha Dosha</i>	<i>Kushta</i> (leprosy), <i>Kilas</i> (type of skin disorder) and congenital presence of teeth

Acharya Charak has also described various types of *Ahara* which led to disease in foetus<sup>[18]</sup>

SN	Pregnant women consuming constantly	Effect on Progeny
1.	Wine	Thirsty, poor in memory and unstable in mind
2.	Iguana	Gravels, stone or <i>Shanermeha</i>
3.	Pork	Red eyes, obstructed, respiration and very rough body hair
4.	Fish	Delayed closure of eye or stiff eyes
5.	<i>Madhur Rasa</i>	Diabetes ( <i>Prameha</i> ), Dumb ( <i>Mook</i> ), or over-obese ( <i>Atishoulya</i> )
6.	<i>Amla Rasa</i>	Internal haemorrhage ( <i>Raktapitta</i> ), eye disorder ( <i>Akshiroga</i> ) and skin disorder ( <i>Twakroga</i> )
7.	<i>Lawan Rasa</i>	Wrinkles and grey hairs ( <i>ValitaPalita</i> ) and Baldness ( <i>Khaliya</i> )
8.	<i>Katu Rasa</i>	Weakness ( <i>Durbal</i> ), deficient in semen ( <i>Alpashukra</i> ) and infertile ( <i>Anapatya</i> )
9.	<i>Tikta Rasa</i>	Consumptive ( <i>Shosh</i> ), weak ( <i>Abala</i> ), under developed ( <i>Anupchita</i> )
10.	<i>Kashaya Rasa</i>	Blackish colour ( <i>Shyav Varna</i> ), <i>Anaha</i> and <i>Udavarta</i> .

#### Shad Garbhakara Bhavas

SN	Bhava	Features <sup>[19]</sup>
1.	<i>Matrija</i>	<i>Twak, Rakta, Mamsa, Meda, Majja; Nabhi, Hridayam, Kloma, Yakrit, Pleeha, Vrikka, Vasti, Purishadhanam, Amashaya, Pakvashaya, UttaraGuda, Adhara Guda,</i>

		<i>Kshudrantra, Sthulantra, Vapa, Vapavahanam</i>
2.	<i>Pitrija</i>	<i>Sukra, Keshha, Smasru, Nakha, Loma, Danta, Asthi, Sira, Snayu, Dhamani</i>
3.	<i>Atmaja</i>	<i>Taasu Taasu, Yonishu Utpatti, Ayu, Atmagnanam, Vignanam, Prerana of Prana and Apana, Swara, Sukha, Duhkha, Ichcha, Dvesha, Chetana, Dhriti, Buddhi, Smriti, Ahankara, Prayatna, Kama, Krodha, Lobha, Bhaya, Harsha, Dharmadharmaseelata, Upachaya, Mana, Indriyas, Akriti, Varna</i>
4.	<i>Satmyaja</i>	<i>Arogyam, Analasyam, Alolupatvam, IndriyaPrasadanam, Svava Varna Beeja Sampat, Praharsha, Veeryam, Balam, Medha, Ayu, Ojas, Prabha, Uthanam, Santosham</i>
5.	<i>Rasaja</i>	<i>Sharirasya Abhinivritti Sharirasya Abhivridhi, Pranabandhata, Tripti, Pushti, Utsaham, Balam, Varnam, Sthiti Hani, Aloulyam, Buddhi, Vritti</i>
6.	<i>Sattvaja</i>	<i>Bhakti, Sheelam, Saucham, Dvesham, Smriti, Moham, Tyagam, Matsaryam, Souryam, Bhayam, Krodham, Tandra, Utsaham, Taikshnyam, Mardavam, Gambhiryam, Anavasthitatvam</i>

*Gharbhaja Vikriti* are mainly cause by *Shadbhava* & diet of mother during pregnancy, during developmental stage of fetus *Ayurved* explain *Garbhini Parichrya* for fetal wellbeing in detail, according to every month. When disturb of *Shadbhava* they causes *Gharbhaja Vikriti* respectively related organ and during growth organogenesis required special nutrition for organogenesis. In the 4th month of development, the *Garbhini* is called as *Dauhrida* at that time, whose wishes and desires, not being honored and gratified lead to the birth of a paralyzed, hump-backed, crooked-armed, lame, dwarfed, defect-eyed, and a blind child. Other *Gharbhaja Vikar* like- *Pangu, Sheersambu / hydrocephalous, Hraday Rog/ congenital heart disease* etc.

#### DISCUSSION

In *Ayurveda Acharya Charaka* has given the concept of *Matrija* (maternal) and *Pitrija* (paternal) *Bhavas* and

mentioned that embryo is produced from mother father self, suitability, nutrition and psyche and different organs develops due to dominance of these *Bhavas*.<sup>[20]</sup> Concept of *Beejabhaga* is also mentioned in *Ayurveda*.<sup>[21]</sup> These *Matrija* (maternal) and *Pitrija* (paternal) *Bhavas* are responsible for different organogenesis like- *Twak, Rakta, Mamsa, Meda, Majja; Nabhi, Hridayam, Kloma, Yakrit, Pleeha, Vrikka, Vasti, Purishadhanam, Amashaya, Pakvashaya, Uttara Guda, Adhara Guda, Kshudrantra, Sthulantra, Vapa, Vapavahanam* are derived from *Matrija* (maternal) *bhavas* and *Sukra, Kesha, Smasru, Nakha, Loma, Danta, Asthi, Sira, Snayu, Dhamani* are derived from *Pitrija* (paternal) *Bhavas*. This organogenesis is controlled by gene or chromosomes. In human being half of chromosome come from maternal and half from paternal chromosomes or genes, that is similarly to *Matrija* (maternal) and *Pitrija* (paternal) *Bhavas*. If any changes in these factors they resulted congenital deformities or *Adibala Privratta Rogas*. Any changes *Matrija* (maternal) and *Pitrija* (paternal) *Bhavas* are depends on health status of parents.

## CONCLUSION

Whole world is looking towards *Ayurveda* for better life style and preventive method of congenital anomalies and hereditary disorders. A malformed alive fetus is one of the worst aspects of pregnancy. These diseases affect the life of parents, society & nation. Over government have millions of rupees for child health. But not controlled yet. The *Ayurveda* suggest that the prevalence of congenital or genetic disorders controlled by various approaches like; Dietary regimen related to *Garbhini Paricharya*, avoiding *Garbhopghatkar Bhava* and *Tridosha* vitiating. It is also prevented by better planning for pregnancy like *Garbha Sanskar*. The healthy progeny may also be achieved by obeying rules of *Ayurveda*. Different fetal anomaly developed at different stages and prevented or manage easily at initial stage by proper *Ausadh* (medications/intervention), *Aahar* (diet) and *Vihara* (daily routine).

*Ayurveda* described many information regarding the *Sharir Rachana* and anatomical abnormalities related

to the human body which mainly arises due to the genetic and congenital factors. The *Garbhajanya Vikriti* arise from the maternal or paternal defects associated with progeny. Defects in *Beeja & Beejabhag* trigger pathogenesis of such types of diseases. As per *Ayurveda Matrija, Pitrija, Rasaja, Satmyaja, Sattvaja* and *Aatmaja* factors play significant role for the healthy progeny and any abnormalities or vitiating in these factors may cause *Garbhajanya Vikriti*. For knowing proper time and are essential to know about development and how to prevent it. So, an anatomically *Garbhaja Vikritis* are prevented by the proper knowledge of genetics in *Ayurveda* (*Beeja & Beejabhag* etc.) and *Shad Garbha Bhava* (*Matrija, Pitrija, Rasaja, Satmyaja, Sattvaja* and *Aatmaja*).

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