

ROLE OF AYURVEDA IN THE PREVENTION OF GENETIC DISORDERS

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ABSTRACT

Ayurveda is much more advanced in Genetic disorders from the ancient period. It emphasized on not only for disorders, as well as prevention too. Nowadays people concentrate more on Lifestyle disorders compared to Genetic disorders. A genetic disorder is caused by one or more abnormalities in the genome. As per WHO, Genetic disorders and congenital abnormalities occur in about 2% to 5% of all live births, accounting for upto 30% of paediatric hospital admissions and cause about 50% of childhood deaths in industrialized countries. The concepts were already mentioned by Acharyas in the context of *Beeja* (sperm and ovum), *Beejabhaga* (chromosomes) and *Beejabhaga avayava* (genes). They highlighted the concept of planning for better progeny, it starts even before marriage. *Kulaja vikara's* are *Asadhya* by prognosis. When there is no therapeutic option, it is preferable to follow the Acharya's recommended precautions. Hence this study highlights the concept of *Beeja*, *Beejabhaga*, *Beejabhaga-avayava dusti* with special reference to the prevention of Genetic disorders.

INTRODUCTION

Acharya's described inherited or genetic disorders under the headings of *Sahaja*, *Kulodbhava*, or *Adibala pravritta*. They highlighted the concept of planning for better progeny, it starts even before marriage. The concept has been told right from Vedic period. In *Manu Smriti*, the method to achieve progeny of intellect, long life and healthy body is mentioned. For purification of *Garbha- Garbha mantra*, before beginning of coitus- *Homa mantra*, to eradicate the abnormalities likely to come in fetus- *Baijika mantra* was advised^[1]. Ayurvedic texts have systematic description about *Beeja* (sperm and ovum), *Beejabhaga* (chromosomes), *Beejabhaganam ekdesha* (Allele of chromosomes) *Beejabhaga avayava* (Genes).^[2] Figure.1 showing this correlation.

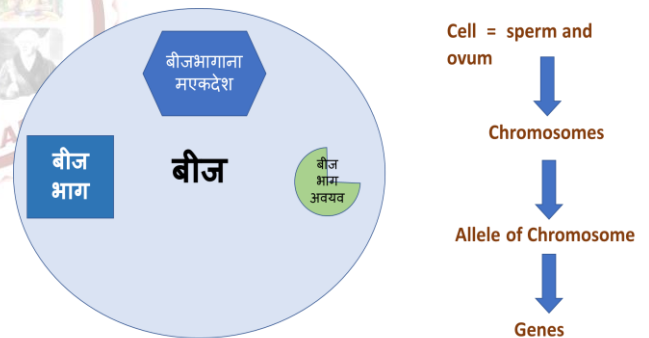


Fig.1

Genetic Disorders

A genetic disorder is defined as a health problem caused by a mutation in a single gene or multiple genes or by a chromosomal abnormality.

There are more than 6000 known genetic disorders. A single gene disorder affects about 1 in 50 people, a chromosomal disorder affects about 1 in 263 people, and around 65% of people have health problems as a result of Congenital genetic mutations.^[3]

There have been 115 new genetic syndromes documented in Arabs during the past 20 years, according to a recent paper on genetic illnesses in Arab populations. One hundred of these disorders are

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autosomal recessive, ten are autosomal dominant, and five may be either autosomal or X-linked recessive^[4].

Yasya yasya hi anga avayavasya beeje beejabhaga upatapto bhavati, Tasya tasya anga

avayavasya vikritir upajayate - Charak states that the *Sahaja Vyadhis* develops in those parts of the body whose corresponding chromosome is damaged^[5]. (As shown in Figure 2)

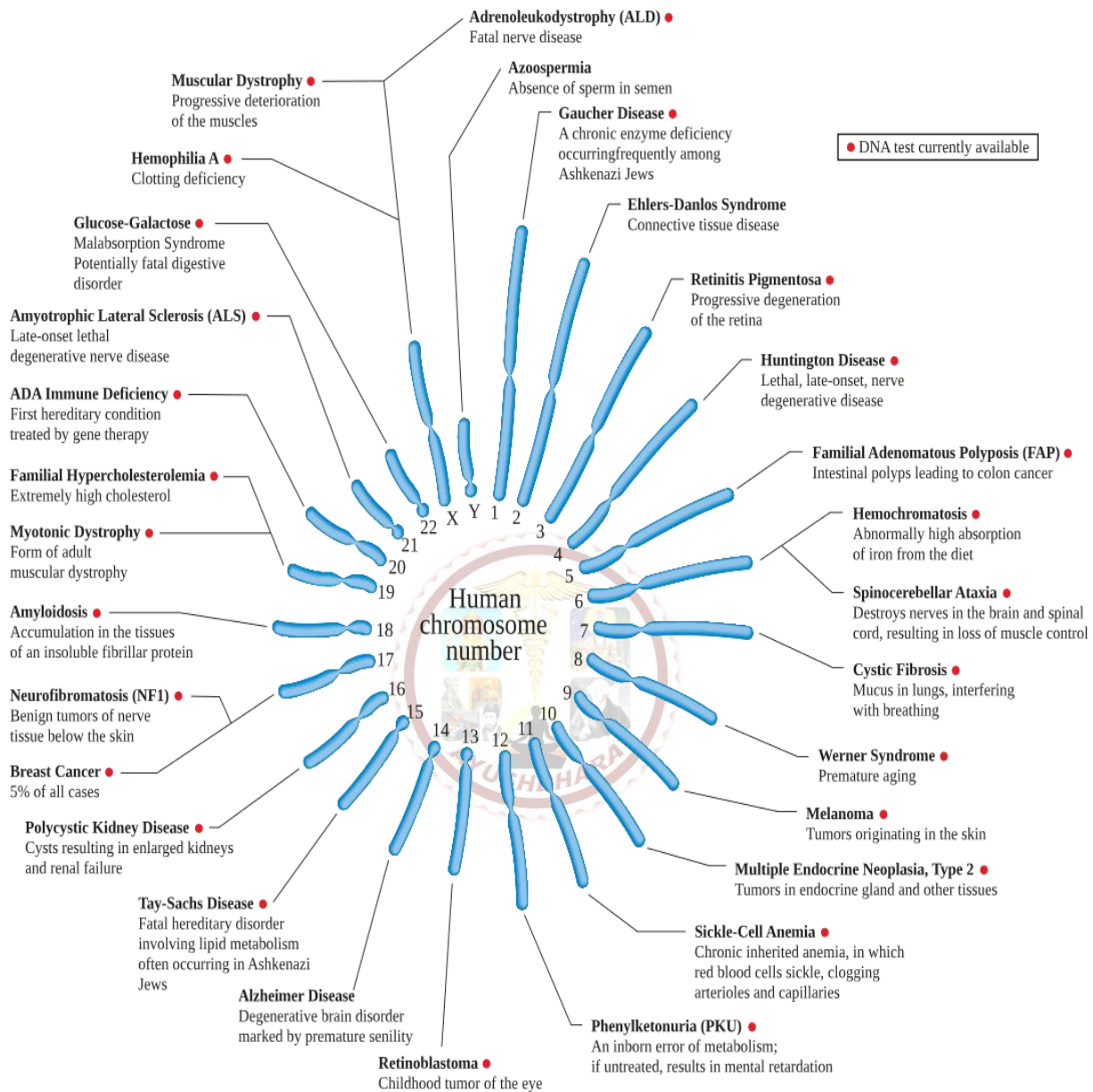


Fig.2^[6]

MATERIALS AND METHODS

Five reasons for genetic disorders^[7]

- 1) *Beeja dosha* – Defects in *Shukra* and *Shonith*.
- 2) *Atma Karma* – Recessive or dominant traits and fresh mutations in chromosomes that are inherited by parents.
- 3) *Ashaya Dosha* – Structural defect in genital tract like testis, ovary, and uterus.
- 4) *Kala Dosha* – Time factor for example, late primi where incidences of Down’s syndrome are more.
- 5) *Matru Ahara* and *Vihara* – Improper food habits and regimen affect *Rasaj bhava* which leads to *Garbha vikriti*. For example – Folic acid deficiency with neural tube defects (mutation), exposure to radiation.

Table 1: The Following table Shows some defects Explained by Acharya Charak^[8]

| S. No. | Cause | Effect |
|--------|---|-----------------------------|
| 1 | Equal part of <i>Sukra</i> and <i>Shonita</i> and <i>Vikrita Beeja bhaga</i> | <i>Dwireta</i> |
| 2 | At the time of copulation discharge of <i>Sukra samaan Vaayu</i> | <i>Pawanendriya</i> |
| 3 | <i>Dushita vayu</i> in <i>Garbhastha</i> foetal body does <i>Vikrit</i> of <i>Shukrashaya dwara</i> . | <i>Sanskaarvaahi Shanda</i> |
| 4 | <i>Manda Alpa Beejayukta Stree</i> and <i>Purusha</i> without <i>Bala</i> and <i>Harsha</i> if indulged in copulation | <i>Narashanda</i> |
| 5 | <i>Manda Alpa Beejayukta Stree</i> and <i>Purusha</i> without <i>Bala</i> and <i>Harsha</i> if indulged in copulation | <i>Narishanda</i> |
| 6 | At the time of copulation, if <i>Stree</i> without interest, <i>Purusha</i> with <i>Alpa Sukra</i> | <i>Vakri</i> |
| 7 | With <i>Irsha Bhava</i> , without interest in copulation for both male and female partners if they performed coitus. | <i>Irshyak</i> |
| 8 | <i>Prakupita Vata</i> and <i>Pitta</i> will harm the testis | <i>Vatika Shanda</i> |

Table-2: In male^[9]

| Chromosomal Defect | Defective part | Result |
|---|------------------------------|----------------------|
| If defective genital organ like testes | <i>Beeja</i> | No conception |
| If there is defective Y chromosome | <i>Beeja bhaga</i> | <i>Vandhya</i> |
| If there is defective genes at a particular lobe of chromosome | <i>Beeja bhaga Avayava</i> | <i>Puthi praja</i> |
| If there is defective genes at a particular location (allele) in lobe of chromosome | <i>Beeja Bhaga Eka Desha</i> | <i>Trina putrika</i> |

Table-3: In Female^[10]

| Chromosomal defect | Defective part | Result |
|--|------------------------------|--------------------|
| If defective genital organ like Ovary | <i>Beeja</i> | No conception |
| If there is defective Y Chromosome | <i>Beeja bhaga</i> | <i>Vandhya</i> |
| If there is defective genes at a particular lobe of chromosome | <i>Beeja bhaga Avayava</i> | <i>Puthi praja</i> |
| If there is defective genes at a particular location (allele) lobe of chromosome | <i>Beeja Bhaga Eka Desha</i> | <i>Varthaa</i> |

Precautionary Measures Explained by Ayurvedic Texts

- *Upanayan Sanskara*
- *Rajaswala Paricharya*
- *Atulyagotra Vivah*
- Following *Naistiki* and *Vaivahika Brahmacharya*
- Parent's age and health
- Genetic – *Shuddha Sukra* and *Artava*
- Pre-conception care
 - i. Performing *Putra Kameshti Yajna*^[11]
 - ii. Intake of *Vrishya Dravyas*
 - iii. Parent's diet
 - iv. Mother's psychology during menses
 - v. Parent's psychology during intercourse
 - vi. Specific time and method of conjugating
- Antenatal care (*Garbhini Paricharya*)

- i. *Pumsavan Karma*^[12]
- ii. *Matru Ahara* (diet of women during pregnancy)
- iii. *Matru Vihara* (mode of life during pregnancy)
- iv. Psychological status during pregnancy
- v. Taking care of *Garbha-upaghatakar bhava's*

Upanayan Sanskar – It includes the moral education like giving knowledge about *Dinacharya*, *Sadvritta*, avoiding *Dashvidha Papa Karma* etc.

Rajaswala Paricharya- The code of conduct mentioned for a menstruating woman is termed as *Rajaswala charya* and is the most ignored aspect of society. One should practise *Rajaswala paricharya* for three days starting at the first sign of menstrual flow. Both physical and mental rest should be a part of the *Charya*. During this period females should maintain a positive attitude and follow the rituals with a pleasant mind. It helps to enhance the fertility.

Table 4: Acts of Women During Menstrual Period and their Effect on baby^[13]

| S.No. | Vihara done during menstruation | Effect in foetus |
|-------|--|--|
| 1. | Day sleeping | Over sleeping |
| 2. | Use of <i>Nasya</i> | Menstrual abnormalities |
| 3. | Use of <i>Anjana</i> (collyrium) | Partial Blindness |
| 4. | <i>Abhyanga</i> (oil massage) | Skin disorders |
| 5. | <i>Snanam</i> (bathing) | Saddish |
| 6. | <i>Hasana</i> (laughing) | Discolouration of teeth, lips and tongue |
| 7. | <i>Rodhana</i> (weeping) | Defective vision |
| 8. | <i>Pralapa</i> (over talking) | Talkative child |
| 9. | <i>Nakhapakarata</i> (paring of the nail) | Deformity of the nail |
| 10. | <i>Pradhavana</i> (fast running) | Unsteady both mentally and physically |
| 11. | <i>Atishabdhan sravana</i> (over hearing) | Deafness |
| 12. | Exposure to the breeze and too much exertion | Mentally trouble |
| 13. | Combing the hair | Baldness |

Atulyagotra Vivaha- The marriage should be practiced in a different *Gotra* because marrying in the same *Gotra* is considered as *Adharma* which must be avoided^[14]. Indian traditional marriages have rigorously adhered to the *Atulyagotra Vivaha* concept^[15]. First cousin marriages as a share of all marriages have been reported to be 11.4% in Egypt, 30% in rural Iran, 29.2% in Iraq, 32% in Jordan, 30.2% in Kuwait, 17.3% among Muslim Lebanese and 7.9% among Christian Lebanese, 37.1% in Pakistan, 31.4% in Saudi Arabia, and 30% in the United Arab Emirates. 80% of single gene disorders and 22% of congenital deformities in Al-Ain, United Arab Emirates, have been reported to be caused by autosomal recessive illnesses. As per WHO, Consanguineous marriages are believed to increase the frequency of autosomal recessive conditions.^[16]

Following Naistiki and Vaivahika Brahmacharya – Keeping distance from opposite sex, not performing any illegal sexual activity is called as *Naistiki Brahmacharya*. Sexual activity with his partner in a defined way with particular time in term known as *Vaivahika Brahmacharya*. A celibacy of 2 months will be followed before copulation.

Parent's Age and Health- Age also has a significant impact in creating healthy offspring because sexual maturity is the point at which biological parents may produce healthy offspring. The entire ancient literature places a high value on the couple's overall health

(physical and psychological normalcy) and their age. According to *Acharya Sushrut*, a man and woman should get married at ages 25 and 16, respectively^[17].

Genetic (Sukra and Shonit)- To successfully conceive four crucial elements for fertility *Ritu*: Regular menstrual cycle and fertile time. *Kshetra* stands for "physiologically adequate and healthy internal reproductive organs," *Ambu* for "good mother nutrition," and *Beeja* for "healthy ovum and spermatozoa." Therefore, *Suddha Sukra* and *Artava* play a bigger role in producing healthy offspring^[18].

Pre-conception Care

Performing Putra Kameshti Yajna – To get a better and healthy progeny not to get particularly boy or a girl, before copulation *Homa, Havana* should be done in front of *Agni*. Even we get reference in *Purana* as *Dashrath Maharaj* did *Putra kameshti Yajna*.

Intake of Vrishya Dravyas – Intake of *Vrishya dravyas* both male and female spouses. It may help to formation of healthy ovum; sperm and it provides nutritional need for zygote in future.

Parent's diet- It is advised that both the wife and the husband follow a salt-free diet that is high in curd and cooked rice during the first three days of the menstrual cycle^[19]. When the menstruation ceases on the fourth day after the performance of particular rituals, coitus should take place.

Table 5: Effects of Parents' diets on Children [20]

| Diet of parents | Effect on child |
|---|--|
| Rice cooked with milk sweetened and mixed with ghee | Fair complexioned son with longevity of 100 years and having capacity to study one Veda. |
| Cooked rice with curd and ghee | Tawny or yellowish complexion, longevity of 100 years and the capacity to study 2 Vedas. |
| Pulp of medicines <i>Uksa</i> and <i>Rishabhaka</i> | Erudite bold son, pleasing sweet voice, learning all Vedas, the longevity of 100 years. |

Mother's Psychology During Menses (*Ritumati Paricharya*)– Positive thoughts, stress-free living, and mental calm are all beneficial for healthy offspring.

Parent's Psychology During Intercourse– Maintaining a stress-free, pleasurable mindset. To prevent any possible genetic mutations, both couples should engage in coitus with *Ichha* (desire). If they

engaged in coitus without any interest, an infant of the *Irshyak* kind would be born.

Specific Time and Method of Conjugating– Following the cessation of menstruation, every even-numbered night from the fourth to the sixteenth produces healthy offspring. Position is crucial during coitus as well.

Table 6: Effect of Conception during *Ritu-kala* on fetus[21]

| S.No. | Day of menstruation | Effect on offspring |
|-------|---------------------|--|
| 1. | First Day | No pregnancy or intrauterine death or stillbirth |
| 2. | Second Day | Abortion or IUD or stillbirth |
| 3. | Third Day | Deficient or defective body parts and short life span. |
| 4. | Fourth Day | Normal and healthy life |

Antenatal care (*Garbhini Paricharya*)

It is crucial to adhere to correct *Matru Ahara* and *Vihara*. Improper *Ahara* affects *Rasaj bhava* which results in *Garbha Vikriti*. To maintain a healthy pregnancy, one must consume *Garbha sansthapaka dravyas* i.e., the *Dravyas* beneficial for the maintenance of pregnancy like *Aindri* (*Bacopa monnieri*), *braahmi* (*Centella asiatica*), *Satavirya* (*Asparagus racemosus*), *Sahashravirya* (*Cynodon dactylon*) and abstain from *Garbha upaghatakar bhavas* i.e., activities and substances which are harmful to foetus like heavy exercises, coitus, harsh or violent activities, ride over vehicles, excess emaciation, sleeping in day and awakening in night, sitting in uneven places and should avoid fasting, grief, anger, visiting lonely places etc.

Table 7: Over Intake of Particular *Rasa* by Woman and its effect on baby[22]

| Over intake of particular <i>Rasa</i> | Effect on baby |
|--|--|
| Intake of more <i>Madhur rasa</i> daily | <i>Prameha, Muka, Atisthula</i> |
| Intake of more <i>Amla rasa</i> daily | <i>Raktapitta, Twak and Akshi roga</i> |
| Intake of more salty food daily | <i>Sheegra Vali palithya, Khalithya roga</i> |
| Intake of more <i>Katu rasa</i> daily | <i>Durbala, Alpashukra, Anapatya</i> |
| Intake of more <i>Tikta rasa</i> daily | <i>Sosha, Abala, Anupachit</i> |
| Intake of more <i>Kashaya rasa</i> daily | <i>Shyamvarna, Anaha, Udavarta</i> |

Table 8: Consumption of diet (vitiating *Dosa*) by woman and its effect on baby[23]

| Diet | Effect on baby |
|--------------------------------|--|
| <i>Vata</i> vitiating diet | Deaf, dumb, having hoarse or nasal voice, lame, hump back, dwarf, possessing less or more body parts |
| <i>Pitta</i> vitiating diet | Baldness, premature graying of hairs, absence of hairs on face, tawny colour of skin, nail and hairs |
| <i>Kapha</i> vitiating diet | Skin disorders like <i>Kustha, Kilasa</i> and congenital presence of teeth |
| <i>Tridosha</i> vitiating diet | Mixed type of anomalies |

DISCUSSION

Pregnancy should never be an accident; it should always be a deliberate process. The strategy to produce healthy offspring will begin during adolescence, as moral instruction is provided in *Upanayan Sanskara*. Rest and seclusion from others should be advised during menstruation since the female vaginal tract is vulnerable to several illnesses and the vagina will be delicate. *Rajaswala paricharya* helps to protect the body from hormonal influences. Due to modern food habits and lifestyle changes, oocytes are constantly exposed to physical, chemical, and psychological stress during the ovulation phase. *Ritumati paricharya* will assist to reduce this stress on oocyte. Marriage ritual is a different sort of counselling in terms of marital life rules, trust, mutual understanding, obligations, goals, and other things. Marriage with *Atulyagotriya girl* will avoid various chromosomal disorders which may affect the child, because in these conditions recessive gene become dominant. Chromosome abnormalities that already exist are easily passed on to future generations.

The *Putra Kameshti Yajna* is significant because it aids in fostering a positive outlook in a couple before to conception, correcting an irregular lifestyle, relieving stress and worry, and providing nutritional care. *Nasya* during *Putra Kameshti Yajna* aids in regulating pituitary gland hormonal secretions like FSH. It has an impact on the primary and secondary meiosis division that occurs in gametes. It contributes to reducing chromosomal abnormalities.

In order to have the desired child once the gametes are formed, *Pumsavan Karma* advised not to change the gender. This is because the first trimester of pregnancy is where the midgut, hindgut, and foregut are formed, as well as the neural tube and the blue print formation takes place. And period of gender identification, there shouldn't be any intrauterine infections because all the cells are rapidly dividing, which also reduces the likelihood of an abortion. Hence considering all these points *Pumsavan Karma* is advised.

Strong data suggests that an ideal diet lowers the incidence of failed pregnancies and severe congenital deformities throughout the reproductive years, but especially before conception. The incidence of foetal neural tube defect and some other congenital abnormalities is decreased by supplementing women's diets with vitamins, particularly folate, before and throughout the first months after conception.^[24] Bhagavad Gita says that the types of food we eat has a direct effect on our mind and soul. These precautionary steps not only serve to prevent genetic problems but also Barker's hypothesis, and these

techniques aid in eugenics. The surge of genetic incongruence and dysphoria can be reduced by following these Ayurvedic strategies.

CONCLUSION

According to Acharya *Charaka Kulaja vikara's* are *Asadhya* by prognosis. When there is no therapeutic option, it is preferable to follow the *Acharya's* recommended precautions. Preconception information and services for family planning can help reduce the number of high-risk pregnancies. Therefore, it is important to practice these preventative steps in order to produce a society with fewer genetic or inherited problems.

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