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## PREVENTION OF GENETIC DISORDERS, PRACHIN (AYURVED) AND ARVACHIN (MODERN) ASPECTS

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### ABSTRACT

From the ancient period, Ayurveda elaborated the genetic disorders as *AdibalaPravruttaVyadhi*. All these diseases are *Kashtasadhya* or *Asadhya*, so it is better to prevent them. So this aspect also widely explained in *Samhitas*. Prevention of genetic disorders at different phases according to *Prachin* (Ayurveda aspect) and Modern aspect is collectively reviewed in this article. **Methodology** mentioned is regarding with four crucial elements like *Rutu, Kshetra, Ambu, Beeja*. according to *Brihatrayi* **Discussion**-For better and healthy progeny, planning of pregnancy by parents should must. It is to be done before conception. There are much more similarities between genetic counseling in aspect of Ayurveda and modern medical science. Spiritually and technologically it is helpful for psychologically and physically healthy progeny and society.

### KEY WORDS

Genetic disorders, Prevention, Genetic counseling, *Beeja, Beejabhaga, Paricharya*

### INTRODUCTION

Ayurvedic Samhitas described genetic disorders under the headings of *Sahaja, Kulaja*, or *Adibalapravrittavyadhi*. 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 intellectual progeny, 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<sup>[1]</sup>. Ayurvedic texts have systematic description about *Beeja* (sperm and ovum), *Beejabhaga* (chromosomes), *Beejabhaganamekdesha* (Allele of chromosomes) *Beejabhagaavayava* (Genes).<sup>[2]</sup>

*Yasyasyahi*

*angaavayavasyabeejeebejabhagaupataptobhavati,*

*Tasyatasyaangaavayavasyavikritirupajaayate*

– Acharya Charak states that the *Sahaja Vyadhi* develops in those parts of the body whose corresponding chromosome is damaged<sup>[3]</sup>.

## AIMS AND OBJECTIVES

Prevention of genetic disorders and genetic counseling, review according to Ayurveda and modern medical science.

## MATERIALS AND METHODS

Five reasons for genetic disorders<sup>[5]</sup>

1) *Beejadasha*– Defects in *Shukra* and *Shonith*.

2) *Atma Karma* – Recessive or dominant traits and fresh mutations in chromosomes that are inherited by parents.

3) *AshayaDasha*– Structural defect in genital tract like testis, ovary, and uterus.

4) *Kala Dasha*– Time factor for example, late primi where incidences of Down's syndrome are more.

5) *MatruAhara* and *Vihara* – Improper food habits and regimen affect *Rasaj bhava* which leads to *Garbhavikriti*. For example – Folic acid deficiency in pregnancy causes neural tube defects, exposure to radiation, or any toxic substance.

**Table-1<sup>(5)</sup>**- Acharya Charaka stated some *vikritis* mentioned below

Sr. No.	Cause	Effect
1	At the time of copulation, if <i>Streew</i> without interest, and <i>Purusha</i> with <i>AlpaShukra</i>	<i>Vakri</i>
2	<i>Dushitavayu</i> in embryo does <i>Vikriti</i> of <i>Shukra</i> and <i>Shayadwara</i> .	<i>Sanskarvahi Shanda</i>
3	At the time of copulation discharge of <i>Shukra</i> with <i>Vaayu</i>	<i>Pawanendriya</i>
4	Equal part of <i>Sukra</i> and <i>Shonitha</i> and <i>VikritaBeejabhaga</i>	<i>Dwireta</i>
5	<i>Manda</i> , <i>AlpaBeejayuktaStree</i> and <i>Purusha</i> without <i>Bala</i> and <i>Harsha</i> if indulged in copulation	<i>Narashanda</i> or <i>Narishanda</i>
6	With <i>IrshaBhava</i> , both male and female partners if they performed coitus.	<i>Irshyak</i>
7	<i>PrakupitaVata</i> and <i>Pitta</i> will harm the testis	<i>Vatika Shanda</i>

**Table-2: In male<sup>[6]</sup>**

Chromosomal Defect	Defective part	Result
If defective genital organ like testes	<i>Beeja</i>	No conception
If there is defective Y chromosome	<i>Beejabhaga</i>	<i>Vandhya</i>
If there is defective genes at a particular lobe of chromosome	<i>BeejabhagaAvayava</i>	<i>Puthipraja</i>
If there is defective genes at a particular location (allele) in lobe of chromosome	<i>BeejaBhagaEkaDesha</i>	<i>Trinaputrika</i>

Table-3: In Female<sup>[7]</sup>

Chromosomal defect	Defective part	Result
If defective genital organ like Ovary	<i>Beeja</i>	No conception
If there is defective Y Chromosome	<i>Beejabhaga</i>	<i>Vandhya</i>
If there is defective genes at a particular lobe of chromosome	<i>BeejabhagaAvayava</i>	<i>Puthipraja</i>
If there is defective genes at a particular location (allele) lobe of chromosome	<i>BeejaBhagaEkaDesha</i>	<i>Varthaa</i>

### Precautionary Measures Explained by Ayurvedic Texts

- *UpanayanSanskara*: It includes the moral education like giving knowledge about *Dinacharya*, *Rutucharya*, *Sadvrittapan*, avoiding papakarmas etc.
- *RajaswalaParicharya*: The code of conduct mentioned for a menstruating woman is termed as *Rajaswalacharya* and is the most ignored aspect of society. One should practice *Rajaswalaparicharya* for four 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 physical hygiene.

Table 4: Acts of Women During Menstrual Period and their Effect on baby<sup>[8]</sup>

S.No.	Vihara done during menstruation	Effect in fetus
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>Hasya</i> (laughing)	Discolouration of teeth, lips and tongue
7.	<i>Rodhana</i> (weeping)	Defective vision
8.	<i>Pralapa</i> (over and 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>Atishabdansrava</i> (over hearing)	Deafness
12.	Exposure to the breeze and too much exertion	Mentally trouble
13.	Combing the hair	Baldness

- *AtulyagotraVivah*, i.e avoid consageneos marriages
- Following *Naishtiki* and *Vaivahika Brahmacharya*
- Parent's age and health
- *Shukra* and *Artavashuddhi* before conception with *shuddhi* of *Rutu*, *kshetra*, *ambu* and *beeja*.
- Mother's psychology during pregnancy

**Pre-conception care**

- i. Performing *Putra KameshtiYajna*<sup>[9]</sup>
- ii. Intake of *Vrishya /VajikarDravyas*
- 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 (*GarbhiniParicharya*)**

- i. *PusanvanKarma*<sup>[10]</sup>
- ii. *MatruAhara*(diet of women during pregnancy)
- iii. *Matru Vihara* ( life style during pregnancy)
- iv. Psychological status during pregnancy
- v. Taking care of *Garbha-upaghatakar bhava*

**AtulyagotraVivaha-** The marriage should be practiced in a different *Gotra* because marrying in the same *Gotra* is considered as *Adharma* which must be avoided.

As per WHO, Consanguineous marriages are believed to increase the frequency of autosomal recessive conditions.

**Following *Naishtikiand Vaivahika Brahmacharya*** – Not performing any illegal sexual activity is called as *Naishtiki Brahmacharya*. (Avoiding multiple sex partners) . Sexual activity with loyal partner in a defined way with particular time is known as *Vaivahika Brahmacharya*.

**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<sup>[13]</sup>.

**Genetic (*ShukraandShonit*)-** 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 with maximum *dhatu sarata*," and

*Beeja*: for "healthy ovum and spermatozoa." Therefore, *ShuddhaShsukraandArtavaplay* important role in producing healthy offspring<sup>[14]</sup>.

**Pre-conception Care**

***Putra Kameshti Yajna*** – To get a better and healthy progeny before copulation *Homa, Havana* should be done in front of *Agni*. Even we get reference in *Purana* as Dasharath Maharaj did *Putra kameshti Yajna*. Now a days parents should take blessings from *Devatas* and elder and wise persons in the society and perform meditation for *Manas shuddhi* and psychological wellbeing.

***VrishyaDravyasevan***– Intake of *Vrishyadravyas* by both male and female spouses. It may help to formation of healthy ovum; sperm and it provides nutritional need for embryo in future.

**Parent's diet-** It is advised that both the wife and husband follow a salt-free diet that is high in curd and cooked rice during the first three days of the menstrual cycle <sup>[15]</sup>. When the menstruation ceases, *Vajikaradravyasevan* by parents is mentioned. Then coitus should take place, at the time of ovulation.

**Table 5: Effects of Parents' diets on Children** <sup>[16]</sup>

Diet of parents	Effect on child
Rice cooked with milk sweetened and mixed with ghruta	Fair complexioned son with longevity of 100 years and having capacity to study one Veda.
Cooked rice with curd and ghruta	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.

**Table 6: Effect of Conception during *Ritu-kala* on fetus** <sup>[17]</sup>

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 i.e. <i>alpayushigarbha</i> .
4.	Fourth Day or after menses ceased up to ovulation	Normal and healthy life

**Table 7: Over Intake of Particular *Rasa* by Mother and its effect on baby** <sup>[18]</sup>

Over intake of particular <i>Rasa</i>	Effect on baby
Intake of more <i>Madhurrasa</i> daily	<i>Prameha, Muka, Atisthula</i>
Intake of more <i>Amlarasa</i> daily	<i>Raktapitta, TwakandAkshiroga</i>
Intake of more salty food daily	<i>Sheeghra Vali, palitya, Khalithyaroga</i>
Intake of more <i>Katurasa</i> daily	<i>Durbala, Alpashukra, Anapatya</i>
Intake of more <i>Tiktarasa</i> daily	<i>Sosha, Abala, Anupachit</i>
Intake of more <i>Kashaya</i> daily	<i>Shyamvarna, Anaha, Udavarta</i>

**Table 8: Consumption of diet (vitiating *Dosa*) by woman and its effect on baby** <sup>[19]</sup>

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

**Antenatal care (GarbhiniParicharya)**

It is crucial to adhere to correct *MatruAhara* and *Vihara*. Improper *Ahara* affects *Rasaj bhava* which results in *GarbhaVikriti*. To maintain healthy pregnancy, one must consume *Garbhasansthapakadravyasi*.e., the *Dravyas* beneficial for the maintenance of pregnancy like *Shatavari*, *Jeevaniyadravyas*, *MasanumasikKashay* etc. Activities and substances which are harmful to fetus like heavy exercises, coitus, harsh or violent activities, ride over vehicles, excess emaciation, *RatriJagarana*, sitting in uneven places, fasting, anger, visiting lonely places should be avoided.

For mental health of mother and fetus, meditation and *Garbhasanskaras* should be performed

**According to modern aspect types of genetic counseling****1) Perspective**

- Wider application
- Identifies individuals for particular defect by screening e.g. Sickle cell anemia
- Long term disability

**2) Retrospective**

- Post MTP
- Neonatal deaths
- Birth defects

**Table 9 Scope of Genetic counseling<sup>(21)</sup>**

Premarital	preconception	pregnancy	Post-natal	Hereditary illness
Ethnicity	Multiple layers of consanguinity	Abnormal marker result	Birth defects	malignancies
Community	Known hereditary illness	Structural anomalies in fetus	Abnormal newborn screen	hemoglobinopathy
Consanguineous marriage	Repeated pregnancy losses	Previously affected child	Syndromic baby	Degenerative illness
Known probands	Birth defects	Genetic testing and diagnosis	Milestone delay	Muscular dystrophy
Carriers for hereditary illness	Neonatal deaths	Maternal infections and illness	Neurodevelopmental delay	Genetic testing options
				Information about genetic vs multifactorial illness

**Premarital counseling****Ethnicity**

- Mixed race
- Personalized risk assessment
- Mendelian disorders
- Carrier screening
- Reproductive options

**Second marriage**

- Affected child from first marriage
- Repeated pregnancy losses
- Infertility
- Carrier screening
- Considering adoption
- Information about genetic screening option

**Preconception counseling**

- Repeated pregnancy losses
- Multiple layers of consanguinity-autosomal recessive disorders
- Known hereditary illness
- Birth defects
- Unexplained neonatal death
- Infertility-options for conceptions

**Teratogenicity**

- Maternal illness e.g. DM
- Exposure e, g. drugs, radiation etc.
- Evaluate teratogenic exposure
- Prognosis
- Follow up
- Postnatal counseling

**Newborn screening**

- Basic and expanded screening
- Long term disability
- Early diagnosis
- Published data
- Lowering paternal anxiety /time wastage/ treatment cost

**Abnormal newborn screening**

- Positive family history
- Elevated levels of Immunoreactive Trypsinogen
- Reflex testing
- Confirmed diagnosis
- Comprehensive mutational analysis

**Syndromic/dysmorphic child**

- Slightly dysmorphic features like vision loss, developmental delay etc.
- Autosomal recessive
- Pedigree charting
- Interpretation of genetic testing reports

**Intellectual disability**

- Autism
- Mental disability
- Parental concern
- Resources
- Early child development center
- Support-social stigma

**NSGC (National Society of Genetic Counselors) Code of Ethics**

- Seek out and acquire balanced,
- accurate and relevant information
- continue education and training to keep abreast of relevant guidelines, regulations, position statements, and standards of genetic counseling practice
- work within the professional practice and recognize the limits of their own knowledge, expertise, and competence
- assure that institutional or professional privilege is not used for personal gain
- be responsible for their physical and emotional health as it impacts their professional judgement and performance including seeking professional support as needed.

**Discussion**

Pregnancy should never be an accident; it should always be a deliberate process. The strategy to produce healthy offspring (*apatya*), progeny (*Santana*) will begin during adolescence. Due to modern food habits and lifestyle changes, couples are constantly exposed to physical, chemical, and psychological stress during the ovulation phase, during coitus and during pregnancy. All *sanskara* and *paricharya* mentioned are helpful to reduce the stress. Marriage ritual is a different sort of counseling in terms of marital life rules, trust, mutual understanding, obligations, goals, and other things regarding togetherness and parenting. *Atulyagotriya marriage* will avoid various chromosomal disorders which may affect the child, because in these conditions recessive gene become dominant. Chromosomal abnormalities that already exist are easily passed on to future generations. 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 *prachin* and *arvachin* strategies.

**CONCLUSION**

According to Acharya *Kulajavikarasare Asadhya*. When there is no therapeutic options, it is preferable to follow the *Acharya's* recommended precautions. Preconception information and services for family planning can help to reduce the number of high-risk pregnancies. Therefore, it is important to practice these preventative steps in order to produce healthy society .

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