WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 8.453
Volume 13, Issue 10, 328-332. Review Article ISSN 2277–7105

GENETICS AND HEREDITY- AN AYURVEDIC VIEW

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Article Received on
29 March 2024,

Revised on 19 April 2024,
Accepted on 09 May 2024

DOI: 10.20959/wjpr202410-32382

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ABSTRACT

Genetics is the scientific study of genes and heredity of how certain qualities or traits are passed from parents to offsprings as a result of changes in DNA sequence. The abnormalities in the chromosome or the genes that they carry are responsible for genetic diseases. The same has been explained and understood in our classics in terms of *beeja, beejabhaga, beejabhaga avayava.* Our science gives a detailed description of the formation and development of *garbha*, factors having negative impact on garbha and measures to prevent it which is specially explained in the *shareera sthana*. Thus, genetics has been given prime importance in ayurveda and this is a comprehensive study of the same.

KEYWORDS: Genetics, Beeja, Beejabhaga, Beejabhaga avayava, Genetic disease.

INTRODUCTION

Genetics is the study of heredity. Heredity is a biological process where a parent passes certain genes on to their offspring which in turn express specific traits.[1] It may also carry the risk of certain diseases which can be termed under genetic diseases. These diseases are broadly classified under three headings which are disorders related to mutation in single gene, chromosomal deformities and complex multigenic disorders.[2] Chromosomes are the carriers of inherent factors situated in the nucleus of the cell.[3] Genes are the basic physical and functional unit of heredity which comprise the chromosome.[4] Along with these mothers'

intrauterine health and psychosomatic health also plays a major role in having a healthy progeny.

In Ayurveda, it is mentioned that the *samsarga* of the *anupahata retas* and *apradusta yoni*, *shonita* and *garbhashaya* in appropriate *rutukala* coupled with *garbotpadakara bhavas* is responsible for development of a healthy *garbha*.[5] For this the role of *shuddha beeja*, *beejabhaga* and *beejabhaga avayava* is mentioned which relates to the genetic composition passed on to the *garbha* from parents.

Thus the genetic factor *beeja*[6] resemble with the gametes which are the special cells required in the process of fertilization. In females *shonita* is said to be the *beeja* which is the ovum and *shukra* in males which is the spermatozoa. *Beejabhaga* is a part of *beeja* which is said to be the one helping in development of *angapratyanga*[7] which resembles with the chromosomes which contain necessary information for formation of numerous tissues and organs of the body. The subtle stage of *beejabhaga*, the most fundamental entity carrying heredity characters which is the *beejabhaga avayava* has resemblance with the genes and the DNA materials.

METHODS

This is purely a literary review done by studying the classical texts along with modern genetics as well as articles of different scholars.

DISCUSSION

Shuddha shukra and *shonita* involving in the *garbha utpatti* may undergo vitiation at the time of *maithuna* because of the influence of various external factors and thus may lead to the derangement in *garbha*.[8] Thus the quality of *beeja* decides about a good offspring. If *dusta shukra shonita* is involved there may be gross defects in *garbha* or may result in *garbhasrava* or *garbhapata*. Even if the Garbha is formed it may end in *vandhyatva.*

Garbhotpadakara bhavas like the *matruja* and *pitruja* bhavas are considered as the maternal and paternal genetic factors and the rest four *atmaja*, *satvaja*, *satmyaja*, *rasaja* being the epigenetic factors responsible in the formation of the *garbha*. The first four among these are considered as the primary *karanas* in *garbha utpatti* whereas the *satmyaja* and *rasaja* bhavas are considered as the *garbha melakottara kala karanas.*[9]

The *beejabhaga* if gets vitiated results in the derangement of the related *anga* in the progeny. Chakrapani has clearly described regarding the same with an example. If a parent is suffering from *ativriddhatara kusta* and thus if the *beejabhaga* gets *dusti* by the *kustajanaka dosha* ,this becomes the cause for development of the *dusta twak* in the progeny and thus *apathya* will also suffer from *kusta*.[10] But this may not be true in all cases, even if a parent is suffering from *kusta* and *beejabhaga* is not *dusta* then the *twak* produced in the child will be healthy. These can be considered as the somatic as well as the genetic anomalies. Chromosomal anomalies can be either due to alteration in the structure of the chromosomes or abnormal number. Various forms of deformities include aneuploidy because of the non-disjunction or anaphase lag, monosomy or the trisomy, deletion, ring chromosome, mosaicism etc.

Vitiated *beeja*, *beejabhaga*, *beejabhaga avayava* also results in the sexual and reproductive dysfunction in the offspring which are mentioned as *stree* and *purusha vyapads*.[11] Also there is mentioning of various types of *napumsaka's* like *dwireta, pavanendriya, samskaravahi,vatika shanda* etc.[12] *When the beejabhaga* is affected i.e *garbhashaya beejabhaga, vandhya* is formed.[13] Similarly in case of *purusha*. When *garbhashaya beejabhaga avayava* is *pradusta putiprajaa* is formed where the offspring will either die or considered to be having *klinna anga pratyanga*.[14] Same to be considered in male which is said as *putipraja*. If *streekara beejabhaga avayava ekadesha* is *pradusta vaarta* is formed where the *garbha* will be having having *stree akruti* but will be *astree*. Chakrapani has stated that the factors such as *stana, upasta, romarajyudgama adi janaka bhaga* is affected.[15] These factors can be considered as the secondary sexual characters which are affected. In case of males, if the *purushakara beejabhaga avayava ekadesha* is *pradusta trunaputrika* is formed where the *garbha* will be having *purusha akruti* but will be *apurusha*. All these resembles with the sex chromosomal deformities such as Klinefelter syndrome where there will be male hypogonadism with male infertility, Turners syndrome with female hypogonadism and primary amenorrhoea, Hermaphroditism with sexual ambiguity.

There is also mentioning of consanguineous marriages said to be as taking place in *tulya gotra*. In *Atulyagotreeya shreera* it is mentioned as marriages should be in *atulya gotra* as *tulya gotra maithuna* is considered as *adharma* and is *nishiddha* in *dharmashastra*.[16] If this is done it gives a prominent risk factor in development of various kinds of congenital anomalies like the cognitive difficulties, heart defects etc.

Acharyas also have mentioned regarding some of the diseases like the *jata pramehi*, *arsha*, *kusta* which gives a clear idea about the hereditary diseases.

CONCLUSION

The description so far infers that our classical texts have a detailed description regarding the minutest part of the *beeja* which are responsible for transmission of the genetic information. A clear idea about not only the maternal and paternal factors but also the *ahara vihara* and other environmental factors influencing the genomics are described. The modern texts also infer the same as the mutation in the gene of a parent cell and other epigenetic factors influence the genotype and the phenotype of the progeny. Thus, to conclude proper knowledge of the *beeja* and their *dusti karanas*, other *upaghatakara karanas* and proper *garbhini charya* leads to attain a healthy progeny.

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