

A CRITICAL REVIEW OF GENETICS IN AYURVEDA

Dr. Sunil Kumar Yadav¹ Dr. Nishi Jain²1 Assistant Professor, Dept. of *Sharira Rachana*, NIA, Jaipur, Rajasthan, India2 Ph.D Scholars, Dept. of *Sharira Rachana*, NIA, Jaipur, Rajasthan, India

ABSTRACT

Ayurveda is a source of well documented knowledge regarding genetics. *Ayurveda* had an elementary knowledge of genetics in applied aspect of life rather than literally in the field of *Shruti utpatti*, *Prakriti*, inheritance of character and growth of foetus by maternal, paternal, *rasaja*, *satmyaja*, *sattwaja* and *atmaja bhavas* (*Shadbhavas*), genomics principles, constituent of *Beeja* responsible for inheritance, gene transformation, and genetic determined disease appear due to *Beeja Dushti* etc. In the present article, reviewing and elaborating the various concepts regarding genetics in literature of *Ayurveda* are mentioned. Still thorough, systematic and scientific approach is need of time for scientific justification of this branch of science in *Ayurveda*; *Ayurveda* is a guide in various streams of medical sciences.

Keywords: *Beeja*, *Beeja Dushti*, genetics, *Prakriti*, *Shadbhavas*, *Shruti utpatti*.

INTRODUCTION

Human was always engaged with fundamental questioning on nature of hereditary long before the concept of genetics became a scientific study. Scientific study on genetics started since ancient time. Although our ancient literature does not implicated the pure and literally 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 character as *Shabbhavas*, genomics principles, constituent of *Beeja* responsible for inheritance, gene transformation, genetic determined disease etc. In the present article, reviewing and elaborating the various concepts regarding genetics in literature of *Ayurveda* are mentioned.

Shruti Utpatti¹

The various Indian and Ayurvedic philosophers have been provided their opinion regarding theory of evolution. In *Ayurveda*, evolution theory adopted and influenced by *Sankhya Darshan*. In this theory,

foremost factor is *Avyakta*. It is the causative factor of all the creatures of universe. *Mahan* is derived from *Avyakta*, dimension of consciousness enveloping entire universe i.e. knowledge by which speciation could occur. Then *Ahamkara* developed from *Mahat* i.e. self-identity and biological mechanism which has enables billions of species to survive in universe. *Ahamkara* interact with three prime qualities like *Sattwa*, *Raja* and *Tama* and by several permutation and combination of these three primal qualities manifests infinite number of living and non-living substances chronologically by *Panchtanmatra* and *Panchmahabhuta*. DNA, the regulator and most important point of genetics is influenced and driven by intelligence to guard each and every growth and metabolism of body which in turn affect the living substance.

Anatomical consideration

The *Beej*² is the basic substance which has minute hidden precursor of future progeny. Male part is *Shukra* (sperm) and female part is *Shonita* (ovum).³ It has different

component viz *Beejbhaga*, *Beejbhagavayava* and *Beejbhagnamekdesha*⁴. If the part of *Angavayotpadakabeeja* (gene responsible for production of organ) gets vitiated then that part is affected with respective disease of parents. If not, then offspring will remain healthy and normal⁵. Dominance of *Shonita* during conception resulting procreation of female child and dominance of *Shukra* leads to male child⁶. Presence of Y chromosome leads to maleness regardless of number of X chromosome present, absence of Y chromosome results in female development.

Prakriti: A man is examined by tenfold examination factors for elaborating detail about human nature, constitution and behaviour. One of these factors is *Prakriti*⁷. *Prakriti* is collectively the genotype and phenotype characteristics of individual. It is formed due to involvement of *Dosha* at the time of fertilization. It is of seven types *Vattik*, *Paittik*, *Kaphaj*, *Vatapitta*, *Pitakapha*, *Kaphavata* and *Samdosha* *Prakriti*. They remain constant throughout life⁸. *Prakriti* has a genetic association that can provide knowledge for classifying human population based on phenotype characteristics. The concept of *Prakriti* in *Ayurveda* should be considered from genomic viewpoint. Permutation and combination of *Vata Pitta Kapha* attributes characters along with other factors like difference types of *Purusha*. *Prakriti* specific treatment including medicine, diet and lifestyle is a distinctive feature of *Ayurveda*. The concept of individualized medicine in perspective of *Prakriti* has been recognized in *Ayurveda*. *Prakriti* assessment evaluates each *Doshas* degree of dominance. It gives an important idea for diagnosis, prognosis and therapeutics. In *Ayurveda*, *Prakriti* constitute the bodily constitution, mental status and fundamental form specific for every individual. It is also determined by following factors: sperm and ovum (*Shukrashonita prakriti*), season and condition of uterus (*Kal Garbhasaya prakriti*), food and regimen of the mother (*Matur aharvihar prakriti*) and the nature of *Mahabhuta* comprising the

foetus (*Mahabhuta vicar prakriti*)⁸. Personal genomic information carrying types of *Prakriti* identifying the health risks, drug response in order to personalize own medical care; take preventive measure to improve the health.

Shadbhavas⁹ (six factors) of embryo

Our ancient seers gave importance to six factors for proper development and growth of foetus. These are *Matraja* (maternal), *Pitraja* (paternal), *Satwaja* (psyche), *Satmyaja* (habitual), *Rasaja* (nutritional) and *Atmaja* (soul) *Bhavas*.

Matraja bhava is the most important and essential factor for proper growth of foetus in intrauterine life. Foetus organs soft in nature arises from maternal component from ovum during conception. Organs are skin, spleen, kidney, bladder, rectum, stomach, intestines, upper and lower part of anus, mesentery and omentum.

Pitraja bhava are production of hair, nail, teeth, bones, veins, ligaments, arteries and semen. Soul passes from generation to generation according to their good and bad conduct of actions since birth and death. It is responsible for the life span, self-realization, mind sense to take things in and to excrete out of the body, stimulation of sense organ, characteristic shape, voice and complexion of individual, desire of happiness and sorrow, liking and disliking, consciousness, courage, intellect, memory, egoism and efforts.

Satmyja bhava is responsible for health of foetus. It might include place, race, cast, habitat, season, disease, exercise, day time sleep, taste, constitution etc.

Rasaja Bhava leads to growth of body, continuity of strength, satisfaction, plumpness and enthusiasm. For proper growth and development of foetus and mother, month wise diet has been recommended. Before conception, the couple is advice to take healthy diet. Ghee and boiled milk with sweet drugs for male because it is homologous with *Shukra* properties. Woman should take *Tila Tail* (*Sesamum*) and *Masha* (*Phaseolus radiatus*) because it increases *Agneya* properties of *Artava*. This improves the quality of sperm and

ova. Maternal part is playing an important role to growth of foetus. It should be free from all toxic and hazardous substances because it may alter the gene expression during embryogenesis and cause nondisjunction during meiosis.

Sattwaja Bhavas includes conduct, purity, enmity, memory, attachment, strong desire, valour, fear, anger, drowsiness, enthusiasm, sharpness, softness, seriousness, instability and other such manifestations of mind. In gestational period, foetus learns sounds respond differently to them after birth. It thinks with their senses. It responds with previous recovery from intra-uterine life.

Genetic transformation

Ayurvedic philosopher knew the method which transforms genetic material from female chromosomes to male chromosomes. There is a process where quality and characters of foetus are improved by *Sansakaar*. It is called as *Punsawan Sansakaar*¹⁰. The process in which embryo may be changed from male to female and from female to male vice versa by different process after conception like *Vatashung*, *Urda*, yellow mustard and curd are mixed and taken in *Pushyanakshatra* and flour of rice along with water should taken *Nasya* in right and left nasal opening for changing embryo in male and female respectively at suitable time and process. This is a major contribution in the field of genetics.

Genetic Diseases

Disease may be since from birth or from hereditary or outflow from family either maternal or paternal way. If there is vitiation of maternal *Beejbhaga* then it will lead to birth of sterile child. If *Beejbhagyava* are vitiated then it will lead to birth of *Putipraja* and if *Beejbhagnamedesh* vitiates then it will lead to birth of *Varta* child¹¹. Similarly paternal side produces *Bandhya*, *Putipraja* and *Trinaputric*¹².

Adibalapravritta diseases are diseases which are congenital in origin and genetically determined are caused by the vitiation of *Beej* of mother and father like *Kushtha* and *Arsha*¹³. *Madhumeha* is ho-

mologous to diabetes mellitus and it is due to *Beejdosha*. Genetic predisposition involvement is much strong in DM¹⁴. *Jatuman* and *Nyachcha* are congenital diseases¹⁵. *Atisthaulyata* is due to vitiation of maternal and paternal *Beeja*¹⁶. The main cause of genetic disease is vitiation of *Matraja Beeja* and *Pittraja Beeja*. Vitiation of *Beeja* is caused by wrong diet and regimen of father and mother and sinful acts of past.

Chromosomal Abnormality¹⁷

Sex chromosome abnormality is one of the strongest points regarding genetic susceptibility. *Charak* in his context described *Dwireta* which may be considered as true hermaphrodites. The other like *Pavanendriya* may consider as klinefelter syndrome having unexplained. *Narshanda* having normal male karyotype but external phenotype is essentially that of a normal female, it may consider male pseudohermaphroditism, *Narishanda* having karyotype is female but the external genitalia is virilised to that they resemble those of a normal male. Similarly, *Samskarvahi*, *Vakri*, *Irsyabhirati* and *Vatikshanda* also mentioned in *Ayurveda*.

The suitable age for father and mother and physical condition of mother at the time of conception have been given by the *Sushruta* which states that mother is of 16 and father is of 25 are favourable for the birth of a normal foetus¹⁸. Lady having more age and sick from long time illness should not allow to conceive. Recent researches showed that there is a strong relation between chromosomal abnormality and advancing maternal age.

It is necessary that male and female should be from different clan and race to avoid consanguineous marriage so that homogenous recessive traits remain separated. Morbidity and mortality increases due to abnormal structural and numerical abnormalities in consanguineous marriage¹⁹.

DISCUSSION

All living substances have a tendency to pass its traits and characters to its progeny. All cells have two parts viz cytoplasm and nucleus. Whole part is divided into so-

matic part and germinal part. All genetic coding and genetic material are present in nucleus. Each chromosome is made up of DNA and further gene which is causative factor for inheritance of character from generation to generation. *Shukra Beeja* is sperm and *Shonita Beeja* is ovum. *Beejbhaga* is central part of sperm or ovum. *Beeja bhagavayava* is the chromosome and *Sharirbeejbhagnamedesh* is gene or allele. There is a correlation between *Prakriti* and gene related symptoms. *Y Ghodke, K Joshi and Partwardhan et al.* describe *Prakriti* on the basis of CYP2C19 gene polymorphisms on the basis of metabolic activity. *Partwardhan et al.* shows relation between *Prakriti* and HLA DRB1 allele frequencies²⁰.

CONCLUSION

Our ancient literature had an elementary knowledge of genetics in applied aspect of life rather than literally in the field of *Prakriti*, inheritance of character as *Shadbhavas*, genomics principles, constituent of *Beeja*, gene transformation, genetic disease etc. Our literature had seeds of genetics which flourishes in light of modern scientists. Still thorough, systematic and scientific approach is need of time for scientific justification of this branch of science.

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CORRESPONDING AUTHOR

Dr. Nishi Jain

Dept. of *Sharira Rachana*,

National Institute of *Ayurveda*,

Jorawer Singh Gate, Amer road,

Jaipur- 302002

Email ID dr.nishijain14@gmail.com

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