INTERNATIONAL AYURVEDIC MEDICAL JOURNAL

IAMJ

International Ayurvedic Medical Journal ***(ISSN: 2320 5091)*** (February- March, 2017) 1(3)

AYURVEDA, GENETICS AND GENOMICS: AN INTEGRATIVE APPROACH TO TRADITIONAL AND BASIC SCIENCES

Harkiran Nehra

M.S., Prasutievum StreeTantra, Associate Professor/Reader, Shri Dhanwantry Ayurvedic College & Dabur Dhanwantry Hospital, Chandigarh, India

Email: harkiran.dr@gmail.com

Published online: March, 2017

ABSTRACT

We are well aware of the fact that allopathic medicine is effectively curing and handling acute diseases whereas Ayurveda has gained prominence in its ability in the management of the diseases which cannot be cured or handled by allopathic medicines. Ayurveda is "Science of Life" and "Knowledge of Longevity", and with the basis of genomics, genetics, and epigenetics, etc., it is important we understand the bridge between Ayurveda and these Basic Sciences. The theory of *Tridosha* is the basis of *Prakriti*-based medicine which offers treatment by way of *ahara* (diet), *vihara* (lifestyle) and *aushadhi* (medication) whereas genetic, epigenetic and genomic factors influence the drug response to form the basis of personalized medicine. As we know, *Beejabhagavayava* is the most fundamental entity which can be grossly compared to a gene and is responsible for expression of a particular trait in an individual. With this information, we can find the genotypic and phenotypic basis of Ayurveda and correlate it with basic sciences. If we can establish the connection between these two sciences, we can revolutionize the concept of "Personalized Medicine". It provides an integrative global approach in the advancement of Ayurveda and creating novel approach in treating patients. So, our main aim is to establish a relation between this *Prakriti* and *Beejabhagavayava* using the concepts of Genetics, Genomics, and Epigenetics from Basic Sciences.

Keywords: Genetics, Genomics, Epigenetics, *Tridosha*, *Beejabhagavayava*, Personalized Medicine.

INTRODUCTION

Ayurveda is a "Science of Life" and the central dogma of Ayurveda postulates each and every human being consists of *Tridosha* (three doshas) *Prakriti* or Primary Constitutional types that have been fixed for one's whole life.

Each individual would have different levels of the three *doshas*, hence there is diversity. Each person's physical, mental and behavioral traits are based on these three *doshas*. Every person could be classified as belonging to one type or the other if one of the *doshas* predominates.

Basic Science is an area of science which mainly deals in the development of scientific knowledge and used for prediction of different aspects of science.

Tridosha is the science of understanding of individual's nature or constitution. It defines the three fundamental principles that govern an individual's body i.e., *vata, pitta* and *kapha*. Each and every individual has a unique combinational balance of all these three fundamental principles. One or combination of two may be predominant in a given individual.

In the same way, the Genes in a particular individual are of unique combination for a particular individual.

Genes or *Beejabhagavayava* are the units of heredity which are transferred from parent to the offspring. They determine most of the characteristics of the offspring. It is the sequence of the nucleotides forming a Chromosome (*Beejabhaga*) which is unique for a particular individual.[15]

Genetics is a branch of Basic Science that is used in the study of heredity and the variation of different inherited characters of the individual from their parents.[14]

Genomics is a branch of Molecular Biology which is concerned with the structure, function, and mapping of genomes, which is the complete set of genetic material and genes present in an organism.[2]

Epigenetics is the study of changes in the organisms caused by modification of gene expression. With this branch of science, we can describe anything other than DNA that is influencing the development of an organism.[11]Genotype and Phenotype are two important and basic concepts in this context. Genotype is the genetic constitution of an individual whereas Phenotype is the set of observable characters of the individual resulting from the interaction of its genotype.[13]

So given a particular individual, his genetic combination as well as his *prakriti* is unique and doesn't change throughout his lifetime. They are fixed and if there is any kind of change in this combination, it may lead to serious illness or *beejangavikriti*. Once we find the correlation between these two concepts of Ayurveda and Basic Science, we can find a personalized medicine for that particular individual.

DashavidhaPariksha and ***AshtavidhaPariksha*** are the two basic concepts of confirming *Prakritik Prakriti* and *DoshajPrakriti* of an individual, in Ayurveda.

Through *AshtavidhaPariksha*, we can perform ***NadiPariksha***, whereas through *DashavidhaPariksha* we can find the ***Prakriti*** (9 of them helping in finding the prakriti and 1 help in finding the vikriti), the individual whose basic constitution is fixed throughout the individual's lifetime.

Beejabhagavayava is often compared to the genes and these genes have a definite sequence which is fixed throughout the individual's lifetime. Any change in this constitution could lead to illness of the individual.

Dashavidha* and *AshtavidhaPariksha

Firstly, we perform *DashavidhaPariksha* and *AshtavidhaPariksha* of the individual. By using these concepts of Ayurveda, we can assess the *Prakriti* of the individual. The *Prakriti* can be of any of the three *doshas* types i.e. *Vata, Pitta*, and *Kapha* or a combination of these *doshas*, either any two of them or all three of them.

Genetic and genomic study

Simultaneously, we perform a Genetic and Genomic study of the same individual of whom we performed *DashavidhaPariksha* and *AshtavidhaPariksha*, which includes the study of genes as well so as to minutely find the reason behind the individual's disorder or disease condition. This can be done by using different techniques like DNA Sequencing, Gene Expression, etc.

Incorporating these concepts of Basic Sciences with the concepts of *DashavidhaPariksha* and *AshtavidhaPariksha* of Ayurveda, we can find the composition of Genes (*Beejabhagavayava*) of the individual. By finding the composition of genes and by detailed study of the DNA we can find the genes which have been altered and which are responsible for causing this genetic disorder. This will help us in completing the first step of forming the bridge between Ayurveda and Basic Sciences.

Genetic and epigenetic modulation

Next step involves performing Genetic and Epigenetic modulation of this individual which helps us in understanding and examination of the influences of different biological and medical aspects. Genetic modulation helps in modulating the defected portion of the gene and Epigenetic modulation helps in finding the changes caused by modification of gene expression rather than alteration of the genetic code itself. So, this can help us find if there is any other aspect causing these changes or influencing the development of the individual's DNA through Genetic modulation and also portion apart from the DNA sequence through Epigenetic Modulation.

Forming Basis of Personalized Medicine

The next step is probably the most important step in designing the personalized medicine for an individual. This involves the study of the defected portion of the Genes (*Beejabhagavayava*) by completely analysing the DNA by using these techniques and embedding these with the concept of *DashavidhaPariksha* and *AshtavidhaPariksha* in Ayurveda. This will help us give the detailed information on the defected portion of the DNA along with the *Prakriti* of the individual. It also helps us to design the right drug or combination of drugs for that particular genetic defect (*Beejadosha/Beejangavikriti*) and helps in developing a Personalized Medicine for a particular individual. By studying the defected portion of *Beejabhagavayava*, we can find the *Beejadosha* for which we can develop personalized medicine depending upon individual's *Prakriti*.

Deep analysis about the genetic combination of the individual and the individual's *Prakriti* will give us detailed information on different aspects and their *doshas*. By using Genetics and Genomics, we can analyze and learn about the individual and by using these branches of Basic Sciences we can develop personalized medicine and treat many different types of diseases (*Vyadhis*).

Effect of *Ahara* (diet)

As we know the exact *Prakriti* i.e. *dosha* of the individual and we also know the genetic combination of the individual, we can easily target that portion of DNA which is affected and try to treat that portion in order to avoid any disorders or diseases. This way we can have designed a personalized medicine as well as further we can develop individuals which are devoid of such defected portions making them healthy. It has been clearly written in Ayurveda that parent's *aharavihara* (diet) before conception and mother's ahara (diet) during pregnancy will correspond to child's health and make him healthier if they are taken proper care of as mentioned by Vriddha Chanakya.

RESULTS

By finding the *Prakriti* and *Kula Vrittanta* of the individual we can postulate the basis of a genetic/hereditary disorder (*Beejadosha / BeejangaVikriti*). These *Beejadosha* or *BeejangaVikruti* (Genetic Disorders) are mainly due to the abnormalities in the components of *Beeja* (Sperm / Ovum) which can be avoided by having a proper care in *Ahara* (Diet) during Pregnancy.

Assuming *Prakriti* as phenotype and blending this with the genotype derived from the concept of Genomics, we can find the missing link between Ayurveda & Basic Sciences and develop an

integrative approach between these two sciences [6] which in turn help in the development of Personalized Medicine by using following four concepts as major tools.

1. *DashavidhaPariksha*
2. *AshtavidhaPariksha*
3. Genetics and
4. Genomics

In addition, other fields such as Epigenetics, etc. as accessory tools, we can analyze the phenotypic and genotypic basis of *Beejabhagavayava* in Ayurveda.

DISCUSSION

We already know that Ayurveda is the traditional and the ancient medicine which is the "Science of Life" and through Basic Sciences we can find the basis of life. If we correlate these two branches of sciences, we can create personalized medicine which is fixed for a particular individual depending upon his / *herbeejabhagavayava* (genes) combination and *prakriti*. It makes the person devoid of any disorders and diseases, thus making their offspring healthy as well as the characters are inherited from parents to offspring. This way, by curing each generation, we can find a way through which we can stay healthy and also make our younger generations much healthier creating illness-less life or we can call it as "personalized preventive health". We are choosing Ayurveda because it adopts natural way to treat the patients and have lesser side effects when compared to other sciences. By any means, this study is not in any way disparaging the capability of Ayurveda which is quite effective in treating a wide array of diseases. It is just about forming a bridge or a connecting link between Ayurveda and traditional sciences to give better as well as personalized treatment for the individual.

CONCLUSION

Keeping in view of occurrence of different diseases (*Vyadhis*), this research is purely in interest of giving Personalized Medicine for the individuals. Personalized Medicine is giving tailored and personal treatment to an individual based on their predicted response or risk of a disease.

In fact, this study is not solely about Personalized Medicine, but it is about creating ***"Personalized Preventive Health"***, which is one step further to Personalized Medicine.

With the advent of Computational Biology and different computational methods, we can cope up with the digital world and blend the concepts of Ayurveda, Basic Sciences and Computational Sciences and take Ayurveda to new heights.

REFERENCES

1. Agnivesh. Mahtigarbhavakrantishariram. In: *Sharma PV* (Editor). CharakSamhita. ChaukhambhaOrientalia: Varanasi. pp. 434-435. **2008**.
2. Brown T.A., Genomes. Garland Science. 1999
3. BijoyaChatterjee, Jigisha Pancholi. Prakriti-based medicine: A step towards personalized medicine. Ayu 141-146, **2011**.
4. Byadgi PS. Dashavidha Pariksha. Parameswarappa's Ayurvediya Vikriti Vigyan & Roga Vigyan, 1st ed.; Chaukhambha Sanskrit Sansthan: Varanasi. Vol II. pp. 141-42, 425. **2007**
5. National Institute of Health. Ayurveda. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2876924/(Accessed August 8, **2016**).
6. Prasher B, Negi S, Aggarwal S. Whole Genome expression and Biochemical correlates of extreme constitutional types defined in Ayurveda. J Transl Med. **2008**
7. Ranade Subhash, Deshpande R R, Chobhe Swati. *A text book of Sharir-KriyaVijnan.*

Chaukhambha Sanskrit Pratisthan: New Delhi, **2007**
8. Sumantran VN, Tillu G. Insights on personalized medicine from Ayurveda. J Altern Complement Med 370-5, 2013.
9. Sushruta. Garbhavyakarnashariram. In: *Sharma PV* (Editor). Sushrutasamhita. Chaukhambha Visvabharti: Varanasi. Vol II. pp. 162. **2004**.
10. Sushruta. Vyadhisamudeshiyaadhyaya. In: *Sharma PV* (Editor). Sushruta Samhita. Chaukhambha Visvabharati: Varanasi. pp.253. **2004**.
11. Trygve Tollefsbol, Personalized Epigenetics. 2015.
12. Valithan, M.S. Towards Ayurvedic Biology – A Decadal Vision Document. **2010**.
13. VNK Usha. *Pre-Conceptinal Care in Ayurveda*. Chaukhambha anskrita: New Delhi, India, **2007.**
14. William S Klug, Micheal R Cummings, Charolette A Spencer, Micheal A Palladino, Concepts of Genetcs. Pearson. 2014
15. https://ghr.nlm.nih.gov/primer/basics/gene

Source of Support: Nil
Conflict Of Interest: None Declared

How to cite this URL: Harkiran Nehra: Ayurveda, Genetics And Genomics: An Integrative Approach To Traditional And Basic Sciences. International Ayurvedic Medical Journal {online} 2017 {cited March, 2017} Available from: http://www.iamj.in/posts/images/upload/295_299.pdf