

**NUTRIGENOMICS- AN APPROACH TOWARDS PERSONALIZED DIET PLAN
THROUGH AYURVEDA: A REVIEW****Dr. Suvitha S. V.^{1*} and Dr. Swati N. Khandale²**¹*Ph. D. Scholar, Department of Kriya Sharira, ITRA, Jamnagar.²Assistant Professor, Department of Kriya Sharir, ITRA, Jamnagar.***Corresponding Author: Dr. Suvitha S. V.**

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ABSTRACT

Background Rationale: Non-communicable disease is considered as the leading cause of death and disability globally. Faulty diet habit is one of the major risk factors for NCDs. Ahara is considered one of the Trayoupasthamba which is essential for living. Ahara is found to have a major impact on maintaining one's health. Acharya Kashyapa mentioned Ahara as Mahabhesaja. Food is considered as the best medicine when it is taken in properly by adopting proper dietic rules otherwise it is similar to toxins. Nutrigenomics is a groundbreaking field that examines the interaction between nutrition and genes to develop personalized dietary recommendations. When combined with the ancient principles of Ayurveda, nutrigenomics provides a holistic approach to health and wellness, offering customized diet plans that cater to an individual's unique genetic and physiological profile.

Materials and Method: Authentic databases such as PubMed, Scopus, MEDLINE, Cochrane library etc. were searched using the acronym nutrigenomics and Ayurveda. Also, various authentic journals, articles were referred.

Discussion: Over 2000 years before our Acharyas mentioned about Ashtavidha Ahara Vidhivisheshaaayatana, Ashtavidha Ahara Vidhivitana, and disease-specific Pathya - Apathya. However, everything in today's advanced world needs to be supported by empirical data from science. Ayur-nutrigenomics is an emerging field of interest pervading Ayurveda systems biology, where the selection of a suitable dietary, therapeutic, and lifestyle regime is made on the basis of clinical assessment of an individual maintaining one's Prakriti. **Conclusion:** This Ayurveda-inspired concept of personalized nutrition is a novel concept of nutrigenomic research for developing personalized functional foods and nutraceuticals suitable for one's genetic makeup with the help of Ayurveda. Incorporation of genomics in ayurvedic dietary principles can give a shred of strong scientific evidence.

KEYWORDS: Nutrition, dietic rules, nutrigenomics, Ayurveda, Prakriti.

INTRODUCTION

Lifestyle disorders are found to be more common in today's era. It is linked with the manners or lifestyle habits we adapt now a days. Rapid socio-economic growth and adaptation of western lifestyle habits made lifestyle disorders to raise its peak. Many technological inventions starting from kitchen to workplace besides its benefits reduced our physical activity and made us to enter into the sophisticated life. Also, unhealthy dietary habits such as usage of packed, frozen and preservatives added foods resulting in many lifestyle issues. Lifestyle disorders include diabetes mellitus, hypertension, thyroid disorders, obesity, heart diseases, liver disorders etc. All these lifestyle disorders are known to be as non - communicable diseases. Non-communicable disease is considered as the leading cause of death and disability globally. Due to its high prevalence, it is responsible for the half of the global burden of disease. Faulty diet habit is one of the major risk factors for NCDs.

Ahara is considered one of the *Trayoupasthamba* which is essential for living.^[1] The word meaning of *Ahara* denotes that which has to be taken in. In *Agreya Aushada*, Charaka stated *Anna* is *shreshta* (superior) in stabilizing the *Sharira*.^[2] *Ahara* is found to have a major impact on maintaining one's physical, mental and social well-being. Acharya Kashyapa mentioned *Ahara* as *Mahabhesaja*.^[3] Food is considered as the best medicine when it is taken in properly by adopting proper dietic rules otherwise it is similar to toxins. Food offers them color, lusture, speech, life, innovation, happiness. Content, nourishment, strength, intelligence etc.^[4] It is strongly advised that a person should never consume food out of greed or when he is unaware of what he eats. One should knowingly and decidedly eat food. Living body is principally grown out of food, hence it is vital to test what you are consuming. Man disciplined to remain on wholesome diet lives for 36000 nights or hundred years.^[5] *Ahara* is one of the factor of *Sharira*

Vruddhikara Bhava & Bala Vruddhikar Bhava, i.e. it plays an important role for growth as well as strength of the body.^[6]

Nutrition and Genomics

Nutrition is the biochemical and physiological process by which an organism uses food to support its life.

Genomics is a field of science that focuses on the study of an organism's entire set of genetic material, called its genome. This includes studying the structure, function, and interactions between all of the genes and other components that make up the genome.^[7]

Nutrigenomics and Ayurgenomics.

Nutrigenomics is a groundbreaking field that examines the interaction between nutrition and genes to develop personalized dietary recommendations.^[8] Application of high throughput functional genomic technologies in nutrition research, studying the mechanism by which nutrients or dietary patterns and the genome interplay each other.

Ayurgenomics is the project which focused on personalized approach of medicine, diet and lifestyle by bridging between Ayurvedic science and modern technologies. Ayurgenomics is the integration of Ayurvedic principles such as prakriti with the genomic technologies such as gene expression.^[9]

AYURNUTRIGENOMICS

Ayur-nutrigenomics is an emerging field of Ayurveda systems biology emphasizes tailoring dietary regimens based on the clinical assessment of an individual's *Prakriti* (constitutional type). When integrated with the principles of nutrigenomics, Ayurveda provides a comprehensive, personalized approach to health and wellness.^[10] This synergy allows for the development of customized diet plans aligned with an individual's unique genetic and physiological profile.

A key mechanism within Ayurveda is epigenetics, where gene expression can be modulated as up regulated or down regulated to restore balance. This is achieved through proper management of diet, digestion, lifestyle, behavior, stress, and environmental factors. Remarkably, such interventions can have trans generational effects, underscoring the long-term benefits of these practices.

Ayurveda always insists on the concept of "*Purusham Purusham Veekshya*" (person-centered care), which contrasts with the generalized, "one-size-fits-all" approach of modern health systems.^[11] This philosophy highlights the importance of individualizing care to achieve optimal health and harmony.

MATERIAL AND METHOD

Authentic databases such as PubMed, Scopus, MEDLINE, Cochrane library etc. were searched using the acronym nutrition, genomics resulted in 39,237

results. Search using acronym aahar and prakriti results in 2 results. nutrigenomics and Ayurveda. Search using (Nutrigenomics) AND (Ayurveda) results in 6 results. Also, various Ayurvedic classical texts, authentic journals, articles were referred.

DISCUSSION

Ayurveda and dietic principles

In our ancient system of medicine, Acharyas mentioned about *Ashtavidha Ahara Vidhivisheshaaayatana*, *Ashtavidha Ahara Vidhivitana*, disease-specific *Pathya-Apathya*, *Viruddha Ahara*.^[12] Dietary consideration in terms of *Pathya* and *Apathya* is an important component of Ayurvedic therapeutics. Sometimes, dietary management in itself is a complete treatment. Ayurvedic dietetics is concerned primarily with the balancing the *Dosha*. Unlike the modern approach, Ayurvedic nutrition addresses not only the specific nutritional aspects of food but also our eating habits, the type of food we eat, *Agnibala* (the digestive metabolism's enzyme activity), the season, the preparation and blending process, our environment, etc. Ayurveda describes *Ahara* as specific food/dietary schedules for different times of the day and for different seasons according to one's age and, most importantly, to suit one's individual constitution or *Prakriti*.

Prakriti – A Guide to Personalize lifestyle

Prakriti of an individual is characterized by a set of physical, physiological, and psychological attributes. An individual's *Prakriti* is another important determinant of the effect of food on the system. For example, based on taste preference, individuals can be grouped as *Vata* (having affinity for sweet, sour, and salty tastes); *Pitta* (with liking for sweet, bitter, and astringent taste), and *Kapha* (for pungent, bitter, and astringent tastes). Whereas these tastes mitigate any negative effects of the inherited constitution, usage of tastes in the reverse order can cause imbalance in the body.

The Science Behind Personalized Diet Plans

By integrating nutrigenomics with Ayurveda, it becomes possible to design diet plans that align with both genetic predispositions and Ayurvedic principles. For example.

- **Vata Dominant Individuals:** These individuals might benefit from warm, easily digestible foods. Nutrigenomic insights could identify genetic markers linked to slower carbohydrate metabolism, refining dietary recommendations.
- **Pitta Dominant Individuals:** Known for high metabolic activity, these individuals might require cooling foods. Nutrigenomics can further identify genes associated with inflammation, guiding anti-inflammatory dietary strategies.
- **Kapha Dominant Individuals:** Prone to slower metabolism, they benefit from light, low-fat diets. Genetic analysis can pinpoint tendencies toward obesity or lipid metabolism issues, tailoring interventions.

The Synergy of Nutrigenomics and Ayurveda

Ayurveda, a traditional Indian system of medicine, emphasizes individualized care based on the concept of *Doshas: Vata, Pitta and Kapha*. These *Doshas* govern physiological and psychological functions, and an individual's prakriti (constitution) reflects their *Dosha* balance. Nutrigenomics complements this by identifying genetic variations that influence nutrient metabolism, susceptibility to diseases, and overall health. Sophisticated molecular techniques based on the different omics (genomics, epigenetics, transcriptomics, proteomics, and metabolomics) may help us in this regard to develop a better understanding toward Ayurvedic principles on nutrition and genomics. Research on *Prakriti* together with nutrition is going to emerge as a major field, which may be termed as Ayurnutrigenomics. Ayurvedic principles have also given the concept of adaptability termed *Satmya*. According to this concept, even if a food habit is harmful considering a person's genetic constitution, due to climatic (*Ritu Satmya*), geographical (*Desha Satmya*), disease (*Roga Satmya*), regular habit (*Oka Satmya*), and sociocultural (*Jati Satmya*) factors, his or her nutriome may become adjusted to that food habit. Ayurveda is an evidence-based science, but it has not been updated in thousands of years when genetic evolution and environmental changes have occurred. Hence, research should be guided to follow Ayurvedic understanding and develop evidence to find its justification in the present time.

CONCLUSION

In recent years, there have been concerted research efforts to understand Ayurvedic principles, such as *Prakriti, Dosa*, and *Agni* using modern scientific tools. The convergence of nutrigenomics and Ayurveda heralds a new era in personalized medicine. "Ayurnutrigenomics is a systematic integration of nutritional practices according to Ayurveda in relation to the *Prakriti* of an individual, which amalgamates information from genomics, proteomics, and metabolomics projected to provide solid evidence based scientific foundation for the advancement of personalized nutrigenomic dietetics. Nutrigenomics assures its relevance in public health and nutritional interference by human genomic variation. Moreover, the scope of analysis in nutrigenomic research is broad and genome wide, which may recognize new biological mechanisms governing host response to food. Collaborative research, advancements in technology, and greater awareness can drive this integration into mainstream healthcare. By aligning genetic insights with Ayurvedic wisdom, nutrigenomics offers a transformative approach to designing personalized diet plans, fostering sustainable health and well-being.

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