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The Indian Vedic System: Ayurveda and Modern Science

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Abstract

The Indian Vedic system is the living wisdom repository whose scientific contributions, philosophical explorations and spiritual knowledge provide cherished comprehensions into nature of truth, the universe and the self. The approaches in Vedic texts are both philosophical and scientific based on knowing the natural world. Since the ancient Indian texts contain scientific insights that align with modern discoveries in various disciplines, the current review has focused upon the Indian Vedic System with a perspective of Ayurveda and Modern science and suggests that it is possible to explore their significance for the future Research and Development.

Keywords: Indian Vedic system, Ayurveda, Modern science

Introduction:

India is an extensive and diverse nation, Known for its rich culture, knowledge diversity and resources since ancient times. The Indian Knowledge System has scientific developments, philosophical understandings and transcendent practices leading to a valuable and enduring heritage for the forthcoming generations[1]. There have been tremendous efforts put forth by researchers since then in various domains and hence the review study was undertaken with the objective of exploring the significant knowledge system of India since Vedic times with an emphasis on Ayurveda and Modern science.

Ayurveda is one of the ancient traditional medicine system of India, which has been recognized world-wide. It has more than 5000 years of history and during Vedic period it has been first recorded. Ayurveda means the "Science of Life", derived from two Sanskrit words 'Ayus': Life or Longevity and 'Veda': Knowledge of Science, which represents the traditional and holistic Indian system aimed at disease prevention and longevity through balance of body, mind and spirit[2]. Also Ayurveda is a science with holistic approach to personalized Medicine and Health for life and consists of ethical, physical, philosophical, psychological and spiritual wellbeing[3]. Ayurveda has its roots in the Rigveda and Atharvaveda, the ancient texts where there are hymns and verses related to the principles of Ayurveda. It was during 1500-500BCE, the Ayurvedic knowledge has been compiled into comprehensive texts. The charkas' focus on development of systematic approaches towards diagnosis and therapy, Introduction of advanced surgical techniques by Sushrutha, Compassionate and holistic care of Jivak Healing legacy has played a significant role in the trusted healing system of Ayurveda.

The Ayurvedic Medicine is aimed at both disease prevention and management where herbs, diet and yoga-based rejuvenation therapies have been given importance at large. Being one of the early medical systems with thousands of Hypothesis and medical concepts, Ayurveda has a promising role in the Health Care and personalised medicine, the ancient Indian texts such as 'Charaka Samhita' and 'Sushruta Samhita' has documented about the Ayurveda[4]. According to Vedic texts, the sages used to transfer knowledge orally before the documentation, followed with systematization of knowledge in basic texts such as Charaka Samhita and Sushruta Samhita, where the Ayurveda system flourished and spread to the neighbouring regions in the Classical period. During the medieval period, due to foreign invasions, many challenges such as translation of texts into Arabic and Persian, thus influencing Unani medicine have been witnessed. Further in Colonial Period, Ayurveda was considered as folk medicine and western medicine was encouraged. Since the post-independence, the government of India focused on recuperation and regulation of Ayurveda and further lead to the establishment of Ministry of AYUSH to promote the system of traditional medicines; fig1.[5]

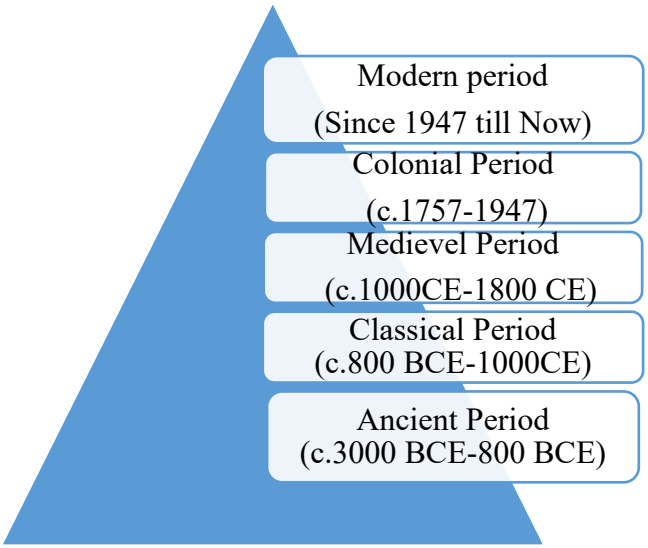

Fig.1: Epochs of Ayurveda

Ayurveda states that matter consists of five basic elements(Mahabhutas)which have the properties of space(Akasha), air(Vayu), fire(Tejas), water(Jala)and earth (Prithvi) and all these elements constitutes three Doshas: Vata, Pitta and Kapha. These doshas are the based on psychology and physiological principles that monitor different components of human body. According to Ayurveda, the human body consists of seven tissues (Saptadhatus), Fat and connective tissue (Medha), tissue fluids (Rasa),blood (Rakta),bones(Asthi),Marrow(Majja),Muscle(Mamsa),Shukra(Semen),Waste products such as faeces, Urine and Sweat (Malas: Purisha, Mutra and Sweda) The cellular transport, balance of electrolytes, removal of waste products is maintained by vata dosha, regulation of body temperature, coordination of optic nerves, management of thirst and hunger.

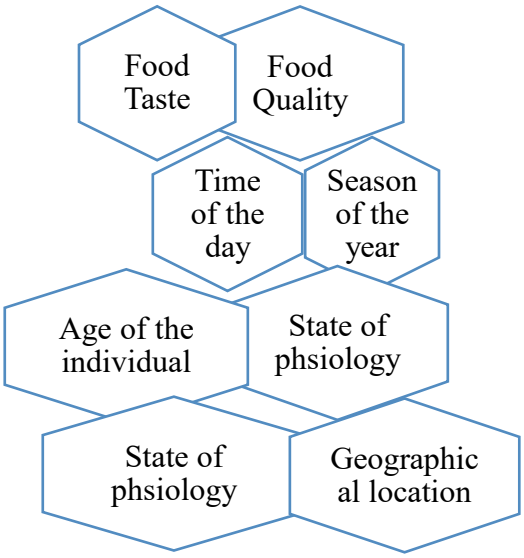

Fig.2: Major governing factors of Diet

Vata dosha maintains the cellular transport, electrolyte balance, elimination of waste products and its effect is increased by dryness. Pitta dosha regulates the body temperature, optic nerve coordination and hunger and thirst management. Kapha provides lubrication for proper functioning of joints. Kapha dosha is increased due to sweet and fatty food and it provides lubrication to the joints for proper functioning. The catabolism of the body is believed to be governed by Vata, metabolism by Pitta and anabolism by Kapha. Ayurveda always focus on the nutrition and diet and some of the major factors that has been administered as a part of diet has been mentioned in the Fig.2[,6,7,8]

The research methodology of Ayurveda is based on the three important examination tools as shown in the fig.3[9]. In the fundamental research, Ayurveda has the investigation objectives has been categorized as Purusha (Human body), Vyadhi(Disease), Aushadaha (Medicine) and Kriyakala (Right Time for Action)[10] The basic perceptions of Ayurveda include Agnibala, Dhatu, Prakriti, Ojabala, Manobala Rasayana Srotas, Shatkriyakala etc[11].

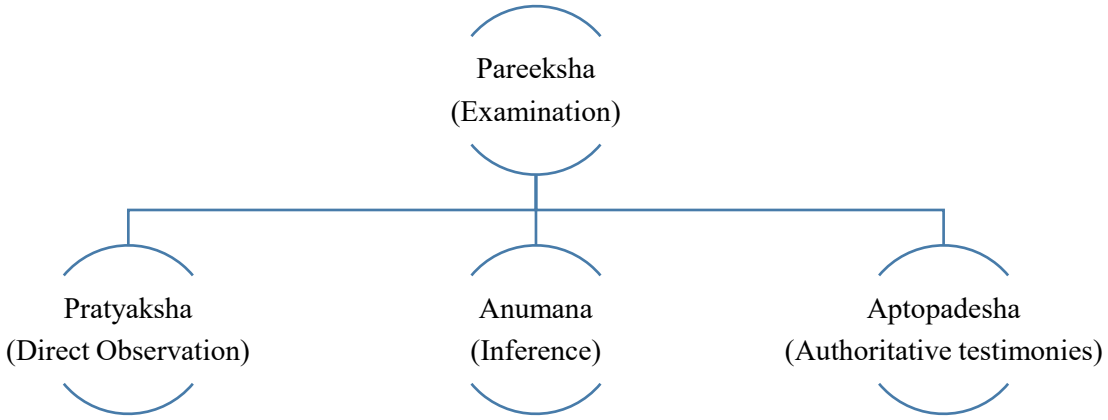

Fig.3: The Important tools of examination in Ayurveda

The earlier studies indicate that there exists a link between the Ayurveda and Modern Science. One of the example to understand the association of ayurvedic knowledge and the modern scientific understanding is DNA(Deoxyribonucleic acid): It is mentioned in the Vedic texts that Samhita is the state of unity or pure consciousness which give rise to Rishi(Knower), Devata(activity)and Chhandas (Final product) and this relates to the expression, where DNA Consists of total information and associates with Samhita, while the mRNA that carries information relates to the Rishi, tRNA facilitates the protein synthesis to produce amino acids associates with Devata and finally the proteins correlates with the chhandas[12].

The research studies also have revealed that the genetic and phenotypic expression of life can be affected by Ayurvedic therapies. However, there shall be some research trials about the ayurvedic formulations on understanding the alteration of epigenetic mechanisms in the target cells or tissues[13].

The nurture of nature through sustainable farming approaches aiming at protection of Biodiversity, Soil fertility and Water resources and its management along with agricultural practices such as natural fertilization, crop rotation that coincide with recent principles of agro ecological system in order to reduce dependency on synthetic inflows and promotion of ecological balance has been encouraged in Vedas. Some of the innovative methods to solve problem mentioned in Vedic texts have been playing important role in the modern science such as computer science, data analysis and engineering, also Vedic mathematics has contributed in strong encryption algorithms development and the Vedas have always encouraged the avoidance of environmental degradation through monitored utilization of natural resources and sustainable practices.[14].

The techniques of Advanced Mathematics, Knowledge of cosmos, ethical values, awareness of languages and ecology, Health care and sustainable agriculture etc. found in Vedas motivates and ignites the in-depth realization of the world around us and thus bridging the ancient knowledge with the recent discoveries can lead to humanity with increased harmony and sustained future. Vedas should not be considered as simply past relics rather they should be understood as the torch for a cheerful future [15].

The teachings of Gita about detachment and perseverance align with the impartial quest for knowledge that characterizes the scientific investigation. According to the profound approaches of various scientific principles and practices based Hindu philosophy, there can be enrichment of approaches and perceptions in modern science for comprehensive understanding of the universe[16].

The key basic concepts such as five elements or Panchamahabutas, as shown in Fig.4 and the nature or prakriti based theory used to explain the predisposition and prognosis of disease and as well governing the choice of the therapy, development of disease through the balancing and imbalancing of three Doshas such as Vata, Pitta and Kapha as shown in table 1 constitutes the chief component of Ayurveda. The

various properties such as Guna, Rasa, Prabhava, Veerya and Vipaka describes the actions of medicine based on the composition of elements. Hence it is very much required to use modern technology in order to reveal the perceptions so as to offer modern health care through existing scientific language[17].

Ayurveda provides a comprehensive perspective on the essence of life, health, and even the most minute atoms, cells, and molecules. Panchamahabhutas signifies the atomic level, Tridoshas denotes the Molecular or Omics level, Sapta dhatus illustrates the Cellular - Biochemical level, Srotas indicates the organ system level, Prakriti represents the Organism level, and ultimately the population level. Consequently, the concepts of Loka and Purusha present a holistic understanding of human beings, highlighting that a human is not merely a collection of cells or tissues but rather a harmonious integration of body, mind, and spirit. Ayurveda offers extensive benefits to humanity across various domains, including preventive medicine, nutrition, genomics, pharmaceutics, and more. All these principles are integral to Ayurvedic diagnostics and therapeutics[18].

According to some studies it is told that Most of the Asian countries including India should attempt to synthesize of traditional medical practices based modern medicine. Also there should be Rigorous scientific scrutiny on ancient system[19]

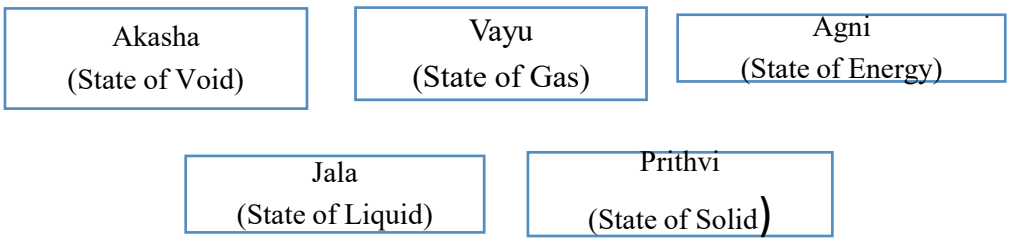

Fig.4: Panchamahabutas/Five elements

Mahabhuta	Characteristic Dosha
Akasha+ Vayu	Vata
Agni	Pitta
Jala+ Prithvi	Kapha

Table1: Mahabhuta and characteristic dosha

Some of the discoveries that have been recognized by the modern science from Vedic Knowledge includes : The existence of solar system, light speed, theory on gravity, the prediction of distance between the sun and earth, estimation of the length of the year, stated theory about the spherical form of earth, measurement of earths' circumference, important mile stones in Holistic medicine, economics, Astronomy, Psychology and Consciousness, Mathematics, Navigation and Ship building, Metallurgy, Rasayan Shastra, Management of water resources, Sustainable agriculture, Ecological protection and

Biodiversity conservation [20].It has been studied that, there is recognition of two types of causes such as efficient and material cause including their root cause has been made in the Vedic science whereas the modern science has not considered the efficient cause although the activities based on efficient cause has been used in the modern engineering [21].Medical Science in Ancient India: Sushruta, Charak, Cloning in Ancient India, Mathematics in Ancient India: The Number Zero, the Binary Numerical System, the Set of two Numbers,0 and 1, Value of Pi and Negative Numbers, Chemistry: Metallurgy, Physics in Ancient India: Universe: Newton versus Rishi Kanad (Laws of Motion). There is a rich history of Science and technology of India in the ancient times and hence India has not been only self-regulating in terms of technological and economic capabilities but also has functioned as comprehensive front-runner[22].

Methods: The literature studies were conducted using various Published literatures, Scientific search engines such as Google scholar, Science direct, Web of Science and PubMed.

Some of the methods that describe Ayurveda includes: Theory of Dosha, Holistic method, Natural Cures, Anticipatory care (Dinacharya and Ritucharya)23. Some of the important methods which describe Modern science includes Experimental method, Evidence based approach, Technological tools etc.

Conclusion: The Indian knowledge system has a long way of various scientific practices since ancient times. There have been lots of efforts put forth by the researchers to explore its journey, thus keeping those efforts, the present study undertaken suggests that the knowledge based Indian Vedic system is robust with its accomplishments, however its profound explorations shall play a significant role in the excellence of the India's future Research and Development across the globe.

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