

A SYSTEMATIC REVIEW OF RASAYAN

Vd. Anand Chamat^{1*}, Vd. Pranauti Milkhe² and Vd. Sneha Tiwari³¹H.O.D Swatha Vritta Department Shri. K. R. Pandav Ayurved College Nagpur.²Assistant Professor, Dravya Guna Department Dr. Rajendra Gode Ayurved College and Hospital Amrawati.³Associate Professor, Kyachikitsa Department Shri. K. R. Pandav Ayurved College Nagpur.

*Corresponding Author: Vd. Anand Chamat

H.O.D Swatha Vritta Department Shri. K. R. Pandav Ayurved College Nagpur.

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INTRODUCTION

Being an eternal science, 'Ayurveda', the 'science of human life', deals with the physical, psychological as well as spiritual well-being of an individual. It covers all the spheres of human life. It is not merely a materialistic science, but a philosophical and factual truth, which our great ancestral sages, through their experience, logic, and power of wisdom, had found true and proved to be the truth of time. Keeping it in pace with the advancing modern or scientific age is the present-day task. Proceeding with such an enriching task is not a challenge but an exhaustive endeavor.

Rasayana, which has been practiced effectively and extensively for ages, is a group of medicinal preparations that are immunostimulants and capable of preventing the causation of many ailments, such as untimely aging. Aging is a process of unfavorable progressive changes associated with a decline in vigor and ending in death. The process of aging involves the coexistence of two opposing factors, namely evolution (Growth) and involution (Atrophy).

These processes continue to operate throughout life but their comparative importance tends to vary in different age groups. With advancing age, the process of involution becomes relatively preponderant and gains the upper hand which has been rightly told by our ancient Acaryas i.e., as the age advanced, human beings gradually lose some of their attributes, because of functional and structural alterations in almost all organ systems. Aging in individuals is affected to a greater extent by genetic factors, diet, social conditions, and the occurrence of age-related disorders.

Acarya Caraka has denied the existence of total antagonistic therapy for timely aging which is a natural phenomenon. However, it is possible to reduce the virulence of aging and improve the quality of life thereupon. In this regard, Rasayana can be of great help. In total, Rasayana is the science of nutrition and complete health care.

Many scientists have attempted to explain with individual previews and put forth various theories in search of the cause of the aging process. They are briefly noted below.

(1) **Master clock theory:** One of the oldest theories and no longer has high credibility. It posits that aging is under direct genetic control. Teleologically, it suggests that the rate of aging within each species has developed for the good of each species. Individual variation develops because of maladaptation, exposure, and lifestyle. In the wild, such maladapted individuals tend to die out and the well-adapted ones persist, altering longevity in the best interest of the species.

(2) **Intoxication theory:** Proposed by T.H. Montgomery, an eminent zoologist, metabolic waste products of a toxic nature accumulate in the tissues through faulty excretory processes to affect the true intoxication and aging of the organism. The same point of view was urged by Jickeli who speculated that metabolism is an incomplete process and, as a consequence of the incomplete utilization of materials, toxic materials accumulate gradually in the cell. The child believed that senescence results from the accumulation of toxic substances in the cell and that rejuvenation is affected by its elimination. Heilbrunn, who fell in line with the intoxication theory of aging, observed that 'typically, the living organism has no means of getting rid of insoluble materials which may be deposited within its cells and this may be an important factor in the aging process'.

Free radical theory: One of the most popular theories of aging; was first proposed by Dr. Denham Harman in 1956. It postulates that aging results from an accumulation of changes caused by reactions in the body

initiated by highly reactive molecules known as 'free radicals'. The changes induced by free radicals are believed to be a major cause of aging, disease development, or/and death. These very reactive molecules easily react with vital molecules in the body, such as DNA causing mutations in the sequence of genetic material; leading to the development of aging.

A major premise in this theory is that free radicals and their precursors may be produced endogenously through normal metabolic processes, or exogenously from sources such as air pollution, radiation, and foods we consume. This theory is bolstered by two recent discoveries. Strains of fruit flies bred for longevity produce larger than normal amounts of an enzyme called superoxide dismutase, which functions to normalize free radicals. Also, the injection of genes that lead to the production of superoxide dismutase into fruit fly embryos prolongs their average life span.

There are several reasons why the free radical theory has remained popular and withstood the test of time. First, it provides many plausible explanations for the process of aging. Second, there are a growing number of studies that implicate free radical reactions in the development of many chronic, age-related diseases. Third, the free radical theory of aging can easily be tested indirectly, using dietary experiments with antioxidant supplements. Fourth, the free radical theory is the only one that encompasses all the concepts in almost all the theories of aging (except the neuroendocrine theory). The free radical theory integrates all the theories that pertain to metabolism and energy expenditure with the theories dealing with molecular changes at the DNA level. Thus, it is easy to see how increasing the metabolic rate would generate an explosion of free radical or reactive oxygen species (ROS). They would, in turn, react with DNA to cause mutations which could lead to the destabilization of cellular functions.

Definition of vayas

Acarya Caraka defines the age (Vayas) as a factor dependent on Kala Pramana Visesa i.e., quantum of time duration.

Classification of vayas

Counting the chronological age from the time of birth, Ayurvedic texts divide human life span into three major categories - Balya, Madhya, and Vrddha. There are some differences of opinion regarding this amongst our ancient scholars. Acarya Susruta quotes that – Up to sixteen years, it is Balya (childhood); up to seventy years, it is Madhya (middle age), and thereafter Vrddha (old age). But Acarya Caraka has opined differently. According to him, Balya is up to thirty years; from thirty to sixty years it is the Madhyama period, and beyond sixty years, it is Vrddhavastha (Ca. Vi. 8/122).

Ayurved and Rasayan

Rasayana Tantra deals with delaying of aging process, increasing intellect and strength, prolonging life, and curing disorders. Dalhana says that Vayahsthapana means prolonging the life up to a hundred years, and Ayuskara means increasing the life span above a hundred years. According to others, Vayahsthapana means maintaining youth and delaying aging. Cakrapani also has the same opinion.

Classification of rasayana

(A) Two types have been mentioned in Ca. Ci. 1/1/16.

- (i) Kutipravesika
- (ii) Vatatapika

(B) Two types as mentioned by Dalhana based on their mode of action.

- (1) Samsodhana - 'Dosasya Samsodhanadi Samsodhanam'
- (2) Samsamana - 'Samsamanam Nagabaladi Prayogadikam'

(C) Three types as per Dalhana's opinion.

- (1) Kamyā
- (2) Naimittika
- (3) Ajasrika

(D) Susruta has classified into four types

- (1) Sarvopaghata Samaniya
- (1) Medhayuskamiya
- (2) Svabhavavaydhi Pratisedhaniya
- (3) Nivrtta Santapiy

(E) It can be further classified into five types based on their benefits (Caraka Sutrasthana, 4th chapter).

- (1) Dirghayuskara - Jivaniya and Brmhaniya
- (2) Tarunyakara - Vayahsthapana
- (3) Balakara - Balya
- (4) Medhakara - Medhya
- (5) Rogahara - Roganut (specific to disease)

While explaining Janapadoddhamsa Vyadhis, Caraka has given that by Rasayana, one can prevent the onset of Maraka Vyadhis (Ca. Vi. 3/12-18). In Ca. Ci. 1-4-13, a reference is mentioned regarding the benefits of Rasayana such as Balya, Jivaniya, Brmhaniya, and Vayahsthapana. Dalhana commenting on Su. Ci. 27/1-2, says that Vardhaka Sthapaka Apraptaprapaka means which increases means which stabilises, and means which gives additional endowments.

So, here Vardhaka is nothing but Ayurvardhaka i.e., prolongation of life span. Sthapaka stabilizes the youth of an individual by improving healthy status and increasing body immunity against ailments. Apraptaprapaka means fulfilling the nourishment needed thereby increasing body tissue elements resulting in increased immunity and the person will be endowed with additional features. All these three here serve the purpose of Swasthyaraksana. Most of the Rasayana Dravyas have

either Madhura Rasa or Madhura Vipaka (Ca. Su. 26/43-1). Such drugs when used give benefits to the body in the form of –

- Increasing Rasa Rudhira, Mamsa, Meda, Asthi, Majja, Ojas and Sukra.
- Increasing longevity.
- Soothes six sense organs
- Promotes strength and complexion
- Improves the integument
- Promotes healthy hairs
- Improves voice
- Increase strength
- Soothes
- Invigorates
- Nourishes
- Promotes body mass
- Gives stability to the body From the foregoing lines, it is observed that the majority of Rasayana Dravyas has prophylactic properties improving the immunity of the body and in turn lengthening the life span. One can get ample references regarding the curative effects of Rasayana in the classics along with their health-promoting effects. Some of them are Aindra Rasayana, Pippali Rasayana, Bhallataka Rasayana (in Kustha, Arsas), Ayo Rasayana (in Mahakustha), Tuvarka Rasayana (in Madhumeha), Somaraji Kalpa (in Kustha - A. S.U. 39/), Lasuna Kalpa (in Vatavyadhi), Guggulu Kalpa, Silajatu Kalpa, Vrddhadaru Kalpa, Sarpirguda (in Ksataksina), Yogaraja (in Pandu), etc.

Free Radicals and Antioxidants - An overview

When all the medical researchers were scratching their heads for a plausible explanation regarding the aging process, a scientist hit the headlines with his new concept in the mid-50s of the twentieth century which got worldwide attraction. It has been considered the biggest advancement in the field of medical science next to Louis Pasteur's discovery of 'germs' as the cause of human diseases. This is nothing but a 'free radical concept' which, today, is known to be involved in the pathophysiology of as many as eighty diseases such as arthritis, atherosclerosis, cancer, etc. It all began way back in 1954 at the Donner Laboratory of Medical Physics of the University of California, Berkeley by an eminent researcher Dr. Denham Harman.

They, working on the subject of aging proposed the 'Free radical theory of aging', which first stated free radicals as the cause of degenerative changes in the body leading to aging. This was first published on July 14, 1955, by the University of California Radiation Laboratory Report titled "Ageing: A Theory based on free radical and radiation chemistry" and as an article a year later in the Journal of Gerontology. His first talk 'Ageing: The Theory Based on free radical and Radiation Chemistry with Application to Cancer and Atherosclerosis' was presented on February 6, 1956, as a Donner Laboratory Seminar.

Sources of free radicals (Oxidants)

There are mainly two sources viz.

- (i) Exogenous
- (ii) Endogenous

Types of free radicals

- (1) Superoxide radical:
- (2) Hydrogen peroxide:
- (3) Hydroxyl radical:
- (4) Nitric Oxide (NO) radical:
- (5) Carbon tetrachloride
- (6) Singlet oxygen:

Ageing - An ayurvedic perspective

A constant reactivity and change in the form and probably functioning is one of the important features of living beings in the biosphere. Modern scientists say that the biosphere is an open system that constantly reacts with the environment. However, the nature of reactivity varies from one organism to another, which is an inherent phenomenon. This is triggered at the time of conception, runs throughout the life span, and when it ceases, the organism dies. Within the period of life span, nature has bestowed two important mottoes. One is growth and the other is reproduction or multiplication of the species. Growth ensures proper maturity for the reproductive phase. After cessation of the reproductive phase, the organism declines towards death. Thus aging, both chronological and qualitative, will be counted, in the strict sense, from the time of conception. In other words, aging occurs as a result of constant biological activities throughout the living period. This incessant activity is made possible by a continuous process of both consumption and preservation of substances for energy. If Cetana (soul) is considered symbolically as a form of energy in a living entity, then Pravrtti (constant activity) can be observed obviously either at the cellular microcosmic level or at the systemic macrocosmic level. This was well explained by our revered Acaryas in the very definition of Ayu as an inseparable bond between Sarira, Indriya, Sattva, and Atma (Ca. Su. 1/42). Though aging is restricted to Sarira or the physical body, others are essential factors and give meaningful definitions for Ayu. Various activities exhibited by the body indicate the presence of Atma, which is the most important factor in sustaining life and without which the body will be declared dead as no activities can be seen (Ca. Sa. 1/70-74). This narration of the classical books gain more weight in the light of modern explanation.

CONCLUSION

Ayurvedic concept of 'Rasayana' seems not only to embody the principal aspects of a new hypothesis centered on an immuno-endocrine psycho neuro axis but also to go beyond it by encompassing the entire human system with its diverse and complicated immunoendocrine pathway (Handa, 1993). It was well known to Ayurvedic physicians that the delicate cellular machinery of the body suffers from trauma, resulting in

wear and tear on different body structures and the deterioration of function.

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