

CLASSICAL REVIEW OF LITERATURE ON AGING WITH SPECIAL REFERENCE TO
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INTRODUCTION

Aging is a universal process. It is an inevitable process. Anyone born has to grow old, whether it be pre-mature aging or a normal aging phenomenon and it is the law of nature. Aging is a multi-factorial phenomenon involving various levels of organizations leading to a gradual decline in the functional capacity of an organism. It is a complex process, is characterized by a number of alterations in central nervous system. Aging is not simply a physical process but also a state of mind.

A constant reactivity and change in the form and probably functioning is one of the important features of living beings in biosphere. Modern scientists say that biosphere is an open system which 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 totally ceases, the organism dies. Within the period of life span, the nature has bestowed two important mottoes. One is growth and other is reproduction or multiplication of the species. Growth ensures proper maturity for reproductive phase. After cessation of reproductive phase, the organism declines towards death. Thus ageing, both chronological and qualitative, will be counted, in strict sense, from the time of conception.

In other words, ageing occurs as a result of constant biological activities throughout living period. This incessant activity is made possible by continuous process of both consumption and preservation of substances for energy. If Chetana (soul) is considered symbolically as a form of energy in a living entity, then Pravrtti (constant activity) can be observed obviously either at cellular microcosmic level or at systemic macrocosmic level. This was well explained by our revered Acharyas in the very definition of Ayu as an inseparable bond between Sarira, Indriya, Sattva and Atma (Ch. Su. 1/42). Though ageing is restricted to Sarira or physical body, other are essential factors and give meaningful definition 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 could be seen (Ch. Su. 1/70-74). These narration of the classical books gain more weight in the light of modern

explanation.

Litrary review**DEFINITION OF VAYAS**

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

Arunadatta, commentator of Astanga Hrdaya defined Vayas as time bound changes occurring in the body - *A.D. on A.H. Sa. 3/10*.

Bhadanta Nagarjuna, the author of Rasa Vaisesika Sutra opines the same.

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 Vriddha. There is some difference of opinions regarding this amongst our ancient scholars.

Acharya Susruta says that., upto sixteen years, it is Balya (childhood); upto seventy years, it is Madhya (middle age) and thereafter Vriddha (old age). But Acharya Charaka has opined differently. According to him, Balya is upto thirty years; from thirty to sixty years it is Madhyama period and beyond sixty years, it is Vrddhavastha (Ch. Vi.8/122)

Kashyapa opines in a different way. He includes Garbha in his classification of age. His classification includes Garbha (foetal life), Bala (upto one year), Kumara (from one to sixteen years), Yauvana (sixteen to thirty four years), Madhyama (thirty four to seventy years) and Vriddha (above seventy years). The child will be on

milk diet only upto one year. From Kaumaravastha, diet mainly includes solid diet. In Yauvanavastha, there will be progress in the development of Dhatus, Bala, Sattva, Virya and Parakrama. Later period is Madhyama in which total maturity ensues and lastly in Vrddhavastha, declination in the functions of Dhatus initiates (Kasyapa Khilasthana 3/72-76).

Harita, another well known scholar of those days, classified Vayas into four namely Bala, Yuvana, Madhyama and Vrddha. Upto sixteen years, Bala, from twenty five to seventy years it is Madhyama and beyond that, Vrddha.

By all the above lines, one can infer that all Acaryas had more or less the same opinion regarding different milestones of life.

I. AGEING STARTS IN DIFFERENT ATTRIBUTES AT DIFFERENT PERIOD

Thus, the ancient classics give a detailed version on the biological aspects of ageing including growth, puberty

and senility. Though the classics have categorised Vayas into Balya (undeveloped), Madhya (developed) and Vriddha (degenerative) Avasthas, they have observed changes occurring during growth and also the initiation of decrement of certain particular faculties of the body. Vagbhata was the first one to record such an observation which was followed later by Sarangadharacharya.

In Sarngadhara Samhita, he followed the same. From the above quotations, it is clear that ageing does not occur simultaneously in all the tissues. Different body tissues are affected with ageing at different time period. Gradual declination of a particular faculty takes place in each decade of life and by the end of decade, that particular faculty is lost.

Table 1: Following table shows the loss of body tissues during various decades of life.

Decade	Loss of Tissues	
	Astanga Samgraha	Sarngadhara Samhita
I	Childhood	Childhood
II	Growth	Growth
III	Complexion	Complexion
IV	Intellect	Intellect
V	Skin	Skin
VI	Reproductive Capacity	Vision
VII	Vision	Reproductive Capacity
VIII	Hearing	Valour
IX	Mind	Knowledge
X	All Sensory And Motor Organs	Motor Organs
XI	-	Mind
XII	-	Life

Vagbhata limits the life span of human beings to hundred years whereas Sarngadhara extends it further by twenty years.

After the **first decade** of life, Balyavastha starts declining. In infancy, the growth rate is rapid and this (accelerated growth) is partly because of continuation of the foetal growth period.

Second decade witnesses the gradual halting of Vrddhi of an individual. The rapid growth spurt which occur at the time of puberty is due to growth hormone, androgens and estrogens and subsequent cessation of growth is due in large part to closure of the epiphysis by estrogens. The complete growth of the body is achieved by mid twenties.

Third decade starts showing deterioration of complexion / lustre of the body (Skin).

Pigmentation of the skin is due to melanin fed into the

basal keratinocyte rather than that stored within the melanocyte. Skin colour is partly due to the amount and activity of the melanocyte and partly a reflection of how melanin is stored and processed in the keratinocytes.

Fourth decade onwards, Medha starts declining. Medha is nothing but the grasping capacity of mind. Lansing, in his book "*Cowdry's Problems of Ageing*" has noted that in subjects above forty years there is a marked progressive decline in overall test performances as related to increasing age. There is a progressive restriction in forming new interests, reduction in new learning and conceptual thinking becomes progressively simplified.

Fifth decade signals the declination of functioning of Tvak. Modern scientists also opine the same. Although the skin is constantly ageing, pronounced effects do not occur until a person reaches the late forties. Around that time, collagen fibres decrease in number, stiffen, break apart and form into a shapeless, matted angle. Elastic

fibres lose some of their elasticity, thicken into clumps and fray and the skin forms crevices and furrows known as wrinkles. There is a decrease in the number of functioning melanocytes, resulting in gray hair and atypical skin pigmentation.

Sixth decade onwards, the activity of Sukra becomes less i.e., reproductive capacity decreases. In male, declining reproductive function is much subtle than in females. At about age of mid fifties, decline in testosterone synthesis leads to less muscle strength, fewer viable sperm and decreased sexual desire. Healthy men often retain reproductive capacity into their 80s and 90s.

When a person reaches **seventh decade**, he starts losing his Drushti. As an individual grows older, the lens grows larger and thicker and becomes far less elastic, partly because of progressive denaturation of the lens proteins. Therefore, the ability of the lens to change shape progressively decreases with age. The power of accommodation decreases as low as zero diopters at age seventy years from about 14 diopters in the childhood. Thereafter, the lens remain almost totally non accomodating, a condition called Presbyopia.

Second most common cause of blindness in the elderly is glaucoma, which is characterized by an abnormally high intraocular pressure due to a buildup of aqueous humour inside the anterior chamber. The fluid compresses the lens into the vitreous body and puts pressure on the neurons of the retina. If the pressure continues, there is a progression from mild visual impairment to irreversible destruction of neurons of the retina, degeneration of the optic disc and blindness.

Eighth decade onwards, an individual starts losing his Srutindriya. A gradual hearing loss associated with ageing is evidenced affecting more than a third of those over seventy five years and is probably due to gradual cumulative loss of hair cells (by prolonged exposure to noise) and neurons. This condition is termed as Presbycusis.

Ninth decade witnesses the gradual loss of functioning of Manas. Memory loss or Dementia is a common problem wherein the deterioration in cognitive abilities that impairs the previously successful performance of activities of daily living. Memory loss is frequently observed in individuals over eighty five and it is the most common and important cognitive ability that is lost. Other mental faculties may also be affected such as attention, judgement, comprehension, orientation, learning, calculation, problem solving, mood and behaviour. Agitation or withdrawal, hallucinations, delusions, insomnia and loss of inhibitions are also common. Delirium is an acute confusional state associated with a change in level of consciousness (ranging from lethargy to agitation). Memory functions such as registration (encoding or acquisition), retention

(storage or consolidation), stabilization and retrieval (decoding or recall) get deteriorated with advancing age.

Last decade shows deterioration of the functions of both sensory and motor organs. i.e., Sarvendriyas. One of the effects of ageing on the nervous system is loss of neurons. This is a consequence of the ageing process. Associated with this decline, there is a decreased capacity for sending nerve impulses to and from the brain so that processing of information diminishes. Conduction velocity decreases, voluntary motor movements slow down and reflex times increase. Degenerative changes and disease states involving the sense organs can alter vision, hearing, taste, smell and touch.

The evacuatory organs (Payu) comprising rectum and bladder are often the victim of ageing pathology. Sluggish bowel movements leading to constipation, incontinence of faeces and urine due to reduced tone of sphincters are well acknowledged. These signs may sometimes also be associated with degenerative changes in CNS. 'Hesitancy' for evacuation is commonly seen among aged individuals.

DISCUSSION

CAUSES OF AGEING PROCESS

No specific etiology has been described as such in any of the Ayurvedic classics. But, there are some points which can be considered favourable in this regard. Those points are dealt in detail in coming lines.

- 1. Kala (Time factor):** Kala is the foremost and important factor to be considered from Ayurvedic standpoint for the onset of ageing process. Charaka mentions that the same foetus after the lapse of definite time becomes child, young and old. (Ch. Sa. 3/8). All the body parts are in very minute form during the embryological period so that they cannot be distinguished. As time advances, they develop into separate organs distinct from one another taking the shape of foetus.

Susruta has also emphasised the involvement of Kala in the development of an individual or ageing process. He says that because of time factor, there will be appearance of secondary sexual characteristics in an individual. This indicates that the childhood has landed up into stage of puberty (Su. Su.14/18). Due to time factor only there occurs the development of embryo within the womb.

In Svabhavoparama Vada, it has been mentioned that Kala causes change in every moment and appreciation of these minute changes that take place daily. So, all the things formed or produced will perish to time. For destruction of any object nothing holds major responsibility ther than time factor (Ch. Su. 16/32-33).

Kala is also responsible for the diminution of Dosas, Dhatus and Malas and Vriddhavastha (Ch. Su. 17/77): Further, Caraka has clearly mentioned the cause of Jara

(old age or ageing process) and Mrtyu as Kalasya Parinama (Ch. Sa. 1/115).

Modern scientists also agree with the influence of time factor on ageing progress. They opine that ageing is a process of unfavourable progressive change usually correlated with the passage of time, becoming apparent after maturity and terminating invariably in death of the individual.

2. Svabhavoparama Vada (Theory of Natural destruction): This theory can be applied from the Madhyama Vayas onwards where in the process of catabolism dominates the process of ageing. There is a causative factor for the formation of beings, but no cause is found for their annihilation. i.e., the destruction of any beings is automatic.

The same view has been expressed in Charaka Samhita while describing the manner with which life process starts during conception. It has been mentioned that the empirical soul accompanied with instruments of knowledge are responsible for the manifestation of life. But, the process of decay, on the other hand, being too quick in succession does not need any cause as such as it is automatic. The reason is that the process of destruction is too quick to allow any other causative factors to leave any impact thereupon (Chakrapani on Ch. Sa.1/58)

On the basis of this theory, it may be deduced that there is cause for life but no cause of death or when the cause responsible for the life causes to function, death ensues. Similarly, it may be assumed that there is a cause for growth and when it becomes ineffective or stops functioning, process of degeneration or ageing process starts. However, this Svabhavoparama Vada was not accepted much by Ayurveda.

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