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Process of Ageing - An Ayurvedic Perspective

Dr. Ankur Singhal, Dr. Komal Gupta¹

Department of Kayachikitsa, ¹P.G.Scholar, Department of P.G. Studies in Kriya Sharira, V.Y.D.S.A.M., Khurja, Uttar Pradesh, India

ABSTRACT

Census shows that one out of every two elderly suffers from at least alone chronic disease that requires lifelong medication. Nearly 50% report arthritis, 40% hypertention, 30% hearing impairment, 40% defective vision, 10% diabetes, 89 out of every 1000 are mentally ill. Ayurveda has considered *Jara* as one of the branch among eight branches of Ayurveda but detailed description as a disease has not been mentioned anywhere. Process of ageing can be described by *Sahaja* Theory and *Vatic* Theory and how various pathological factors such as impaired *Dhatu Vyuha Karatha*, *Rasa Shoshana*, *Dhatu Asamata*, *Agni Asamata*, *Mano Vyaharsha* and *Ayu Upaghata* leads to *Ojakshaya* and ultimately *Jara*.

Key words: Ageing, *Jara*, *Oja Kshaya*.

INTRODUCTION

With improving healthcare our average life expectancy has risen from 57 in 1990 to 65 today. In the next two decades, India will also be the home to the world's second largest population of elderly. The age wave means that the no. of senior citizens is expected to touch 198 million in 2030. This has resulted in ever increasing number of old people in every nation. The problem before the scientist therefore is how to keep the old people physically fit and how to make them useful to society. This calls for intensive research into the causes which lead to ageing.

Address for correspondence:

Dr. Ankur Singhal

Reader, Dept. of Kayachikitsa, V.Y.D.S.A.M.,
Khurja, Uttar Pradesh, India.

E-mail: aarogyakendra@gmail.com

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Ageing is a natural inevitable, irreversible always progressive biological process associated with decline of physical and mental functions. Study of aging at different levels social, behavioral, physiological, morphological, cellular and molecular is need of the hour.

The Ayurvedic concept of ageing

The definition of Ayurveda itself denotes that it is the knowledge of various aspects of life processes, ageing being one of them.

The process of ageing as seen in Ayurveda:

Transformation is the hallmark of time, everything that is living undergoes various changes before it is worn completely – This cycle of changes is known in Ayurveda as '*Parinama*' which takes place under the constant influence of "*Kaala*" of the time factor. In other words, *Kala* is responsible for *parinama*. In this context, *parinama* being ageing, the sequential events of *Balya*, *Tarunyayouvana*, *Proudha*, *Vardhikya* are all consequential eventualities of *Kaala*.

Therefore, Ayurveda recognized *Kaala* or *Parinama* as the potential causative factor of degenerative disease entities.

Jara being a *Swabhava Bala Pravrutta Roga* occurs due to the above mentioned *Vyadhi Hetu Kaala / Parinama*.

The effect of time is bound to happen and is “*Nishpratikriya*” i.e. unavoidable however if one adheres to certain modes of life, one can expect smooth sailing. The same is stressed by *Acharya Chakrapani*, while commenting on whether lifespan of an individual is predetermined. He compared the human body to a *Ratha* (chariot), the full lifespan of the *Ratha* is subject to its proper maintenance or lubrication as well as the conditions of the roads it has to traverse. Otherwise it is bound to deteriorate early. He interpreted that the *Ayu* is not predetermined but is dependent on various endogenous and exogenous factors that interplay in the human body. The components of *Ayu*, are *Shareera*, *Indriya*, *Satwa* and *Atma*. *Atma* is a supreme entity, immune to the cycle of birth, death and disease (*Nirvikara Parstu atma*). The other 3 components of *Ayu* i.e. 1) *Shareera* 2) *Indriya* 3) *Satwa* along with the *Vikruti* that fall within the scope, being taken into considerations.

It can be pointed out that there is no single and complete concept on the aging process in modern medicine. Different theories have been put on *Jeevaparamanus* i.e. *Dhatus*, *Srotases*, *Malas*, *Indriyas*, which are under constant interaction with the *Tridoshas*. In the context of *Jara Janya Vikaras*.

Vata Dosha is predominant; *Pitta* is irregular while *Kapha* is in a depleted state. This cascade of events targets the ‘*Vyadhikshamatva*’ as well as *Satwa* of the *Vridhdha*, submerging him in diseases.

DISCUSSION

After the middle age, biological aging is best characterized by progressive construction of the homeostatic reserve of every organ system. The decline often referred to as homeostasis, is evident by 5th decade and is gradual and progressive, although the rate and extent of decline vary.^[1]

The life science of Ayurveda explains that, process of senescence begins as naturally *Vata* attains provocation and it also agrees that the process of

aging is genetically determined. It can be analyzed as follows.

SAHAJA (GENETIC) THEORY

Chakrapani opines that the time of onset of natural aging varies from individual to individual. It may be delayed in persons having the features of long life span (*Dheergayu*) whereas early in persons having the features of medium life span (*Madhyamayu*) and short life span (*Avarayu*).^[2]

Charaka opines that *Prakriti Guna Sampat* i.e. constitutional compactness is one of the prime factors required to achieve long life span, which is genetically determined, as explained by *Chakrapani*.^[1]

Sarva Dhatu Sara i.e. compactness of all body tissue is another condition where the onset of aging will be delayed i.e. *manda jara* as explained by *Charaka*.^[3] The same constitutional compactness is considered as *bala* by *Bhavamishra*.^[4]

Charaka further explains that *sahaja* i.e. genetically transmission is one of the responsible factor on which the compactness of body tissues (*bala*) depends. To summarize, the onset and progress of aging depends on the factors like *prakriti* (constitutional) and *sara* (compactness of body tissues) which are genetically predetermined. Hence the process of aging can be considered as a genetically predetermined entity. *Sahaja* theory seems to be similar to that of programmed aging theory as explained by modern medical science. It suggests that aging as a predetermined presumably genetic alteration in cellular function that leads to susceptibility to disease and death.

Vatic theory

Till middle age (*Prakrita*) *Vata* is responsible for following functions i.e.

- *Sarva Dhatu Vyuhakarata*: Providing compactness of body tissue by assessing the type of nourishment required.^[5]
- *Dosha Dhatu Agni Samata* - Maintaining the state of homeostasis of *Dosha*, *Dhatu* (body tissues) and *Agni* (digestive and metabolic activities).^[6]

- *Shareera and Manas kriya*: Keeping the body and mind under sound functional status.
- *Ayu Anuvruttikara* : Maintaining the body elements in normal physiological condition.^[5]

But as Middle Age passes, *Vata* will be provoked naturally and sets in the molecular program of cellular senescence and bring out the following changes.

1. Impaired *sarvadhātu vyuhakarata* :

The provoked *vata* becomes unable to provide the compactness to the body tissues, because of faulty assessment of the type of nourishment which is required to the cells. Hence it brings out the formation of *Vikrita Dhatus* i.e. defective cells, while ultimately resulting in cellular senescence.

2. *Rasa Shoshana* (Errors in nourishing elements):

The health of an individual is a critical indicator of the body's nutritional status. It is nutrition, a critical and essential need to the body which has to be satiated for the individual to function normally.^[7]

Bhavamishra explains that, after the middle age, provoked *Vata* brings the *Shoshnata* in *Poshaka Rasa* i.e. errors in nourishing elements, which results in inadequate nourishment to the tissues and leading to improper *Dhatu* formation resulting in cellular senescence (*dhatukshaya*).

3. *Dhatu Asamata*:

Sushruta explains that provoked *Vata* by its *Shoshana* property become responsible for *Dhatukshaya*.^[8] The same concept is responsible for cellular senescence also, i.e. after the middle age naturally provoked *Shoshana* property of *Vata Dosha* accumulates in cells (*Dhatus*) and after reaching a certain levels brings out the *Dhatu Kshaya* i.e. cellular senescence.

Sushruta explains that, senescent cells (*Paripakwa shareeratwa*) have decreased capacity for uptake of nutrient (*poshaka rasa*) to repair of cellular damage. Dalhana commenting on this, adds that, under this state nourishment will be inadequate

(*Ishat*) and only maintains minimal cellular functions (*Jeevana Matram Karoti*).^[9]

4. *Agni Asamata*:

Charaka explains that sound functional condition of *Agni* i.e. digestive and metabolic activities are responsible for *Ayu Bala*.^[10] i.e. to keep the body and mind under sound functional status and keep the process of cellular senescence to be locked.

But after the middle age naturally *Agni mandyata* occurs, which results in improper cellular formation (*Vikruta Dhatu*) by improper digestive and metabolic activities, which ultimately resulting in cellular senescence.

5. *Mano Vyaharsha*:

Prakrita Vata is responsible for all mental functions i.e. *Niyanta, Praneta cha. manasa*, but provoked *vata* decreases the mental functions i.e. *Manovyaharshata*.^[11]

6. *Ayu Upaghata* (cellular senescence):

It is one of the functions of provoked *Vata* i.e. by opening the lock of process of cellular senescence brings out the *Ayu Upaghata*.

7. *Oja Kshaya*:

Oja is responsible for *Shareera Sthairya* i.e. compactness of body elements by providing adequate nutritional defense against body elements. *Oja* will be nourished by *Anna rasa* (nutrients).

In old age *Agnikshaya, Dhatu Kshaya* and errors in nourishing elements leads to the state of *Ojakshaya* i.e. inadequate nutritional defense against body elements that leads to the molecular cellular injury to cells, exceeds their repair capacity this further accelerating the aging process ultimately ending in death.

According to modern science, although a number of theories have been proposed to explain the mechanism of aging, it is now clear that all ageing is multi factorial. It involves an endogenous molecular program of cellular senescence as well as continuous

exposure throughout life to adverse exogenous influences leading to progressive encroachment on the cells survivability so called wear and tear, In this scenario molecular injury to cells exceeds their repair capacity, this accelerating the aging process. Some of the important theories have been proposed to explain the causes of aging.

On keen observation it seems that the above said modern and ayurvedic theories have got some similarities as follows

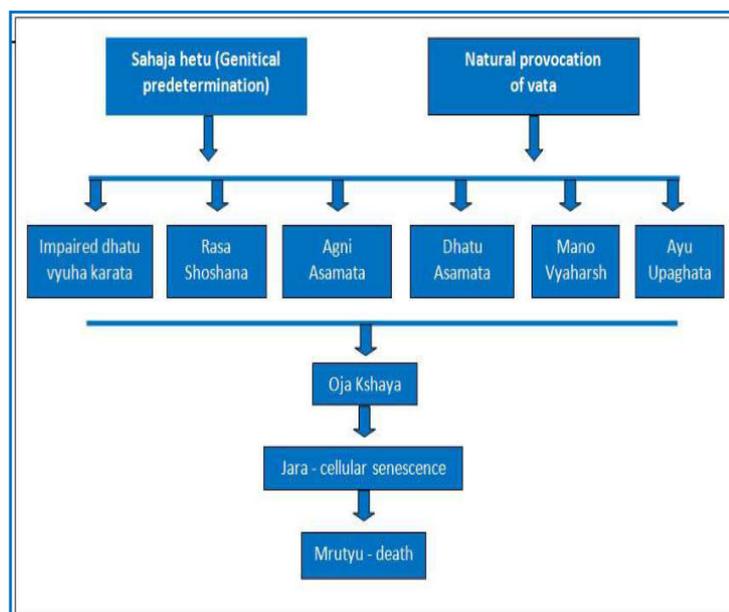
S.N.	Theories	Similarity
1.	Impaired <i>Dhatu Vyuhakarata</i> and gene regulation and genetic instability theory.	Faulty assessment of nutrition to the cell.
2.	<i>Rasa Shoshana</i> and error theory.	Errors in nourishing elements
3.	<i>Dhatu Asmata</i> and somatic mutation theory, other protein i.e. collagen changes theory.	Unusual changes occurring in the cell
4.	<i>Agni Asmata</i> and free radical theory, age pigment theory.	Metabolic impairment
5.	<i>Mano Vyaharsha</i> - enzymatic theory of decreased learning and memory	Diminished mental functions
6.	<i>Ayu Anuvrutti</i> and hormonal theory.	Responsible for growth, development and senescence
7.	Dhatus and agni asamata and cross linker's changes.	Cellular, enzymatic etc.
8.	Ojakshaya and immune response	Susceptibility to disease and death.

CONCLUSION

Process of aging depends upon *Sahaja Hetu* and aggravation of *Vata Dosha* which ultimately leads to impaired *Dhatu Vyuhakarta*, *Rasa Shoshana*, *Agni*

Asamata, *Dhatu Asamata*, *Mano Vyaharsha* and *Ayu Upaghata*. These all factors all together results in *Ojakshaya*, which results in cellular senescence i.e. *Jara* and ultimately death.

Schematic representation of process of Aging:



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