

A Critical Review on the Concept of *Swabhavoparamvad* in Relation with ‘Apoptosis’ and ‘Homeostasis’ w.s.r. to ‘Jara’ (Physiological Aging)

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Abstract

Acharya Charak while mentioning ‘Jara’ said that, it is a *Swabhavajavyadhi* and is *Nishpratikriya*. The same follows the concept of ‘*Swabhavoparamvad*’. Here, *Swabhava* means natural and the meaning of *uparam* is destruction, so the word *swabhavoparam* stands for natural destruction. After birth, growth and senility ultimately leading to death are inevitable process. It is correctly stated that aging begins before birth and continues throughout life at different rates, in different races for different individuals and for different tissues of the body. It involves two opposite processes that simultaneously come into operation i.e. growth and atrophy. In an organism, aging represents structural and functional changes over its entire life span. It is a universal phenomenon characterized by progressive deterioration of cells and organs due to accumulation of macromolecular and organelle damage. The continuous removal of worn out components and replacement with new synthesized one ensures cellular homeostasis and delays aging process. While, apoptosis is, without question, critical for homeostasis, it is conceivable that even normal apoptotic processes might, over-time lead to normal aging phenotypes or age-related pathologies. So, here in this review I am going to establish the fact that homeostasis and apoptosis are important for normal maintenance of health as well as healthy aging, in Ayurvedic point of view as both the terms ‘homeostasis’ and ‘apoptosis’ comes under the definition of ‘*swabhavoparam*’.

Keywords *Jara*, *Swabhavoparamvad*, Aging, Homeostasis, Apoptosis



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INTRODUCTION

In Ayurveda, the human body has been described as a living subject, where the wear and tear is a continuous and perpetual phenomenon. Right from the neonatal life to young age where growth and development occurs, regeneration and degeneration go simultaneously in a balanced manner. Afterwards this process is altered and degeneration takes upper hand, resulting in ultimately aging and then death¹.

Ayurveda mentioned Human body (sharira)—

'Shiryate iti shariram'

-Human body is bound to destroy, it is continuously destroying.

The doctrine '*Swabhavoparamvad*' which is the theory of natural destruction is totally a physiological process that is taking place in all *bhava padarthas* of this universe including the human being right from its production. This is not obvious or visible as the process is very quick and because of its rapidity, it is considered that there is no cause in the destruction^{2,3}.

AIMS AND OBJECTIVES OF STUDY

1. To study the concept of '*swabhavoparamvad*' in Ayurvedic literature.

2. To establish the concept of '*swabhavoparamvada*' in apoptosis and homeostasis point of view.
3. To discuss and re-evaluate the various concepts and principles related to '*jara*' (aging) in both Ayurvedic and modern literature.

MATERIALS

This article is based on a review of ayurvedic texts. Materials related to aging, *vaya* and other relevant topics have been collected. The main Ayurvedic text used in this study is Charak Samhita. We have also referred to the modern texts and searched various websites to collect information on the relevant topics.

DISCUSSION

Aging is a natural phenomenon, but nobody wants to grow old; a dilemma that everyone faces. In Ayurveda, every condition that leads to a disturbance of homeostasis is termed as a disease^{4,5,6}. Thus *vriddhavastha* (*jara*) has also been considered as a disease. It is categorised under the heading of natural diseases. These natural diseases are due to *swabhava* (nature) and depend on *kala* (time), the examples of natural diseases are hunger, thirst, *jaravastha* (aging), and death

etc^{7,8}. Aging is the accumulation of changes in an organism over time, which in human refers to a multidimensional process of physical, psychological and social changes⁹. The aging process is of course a biological reality which has its own dynamic, largely beyond human control. Aging has been defined as progressive generalized impairment of functions resulting in loss of adaptive response to stress and in a growing risk of age associated disease¹⁰.

Apoptosis is an evolutionarily conserved cell death program that is strictly regulated and executed through finely controlled signaling pathways. In multicellular organisms, apoptosis is essential for embryogenesis, development and tissue homeostasis (i.e. cell turnover, removal of damaged and oncogenic cells, immune-reactive cells and pathogen infected cells)^{11,12}. Given the importance of apoptosis for normal tissue function, it is not surprising that defects in the regulation of apoptosis have been linked to a number of degenerative and hyper-proliferative diseases¹³. Apoptotic cell death is an integral part of cell turnover in many tissues, and proper corpse clearance is vital to maintaining tissue homeostasis in all multicellular organisms. All living tissues

have some mechanisms in place to handle corpse clearance, and most cell types possess the ability to phagocytose apoptotic cells, underlining the relevance of this process in metazoan health¹⁴.

There are a multitude of different mechanisms and biological processes that causes aging. However one important one that should be mentioned is homeostasis. The concept of homeostasis is very important to the biological human aging process as homeostasis is important in maintaining the body in equilibrium by aiding in the support of the body's function. However, the body's ability to maintain itself at equilibrium decreases over the lifespan. Essentially with the decline of homeostasis comes aging, as certain body functions are no longer working at the normal range¹⁵.

Homeostasis in the body typically relies on an internal equilibrium that is maintained regardless of environmental factors such as temperature. Processes that can trigger aging, neurological degeneration, cell death, and disrupt wound healing often cause tissue homeostasis to be thrown off balance¹⁶.

Charak has given clear cut description, that the factors which are responsible for the formation of *dhatu*s (cellular elements) if for

some reasons are abnormal then it would lead to production of abnormal *dhatu*s and if become normal than normal *dhatu*s are produced but the destruction of these *dhatu*s are natural and there are no reason behind this¹⁷. Chakrapani has clarified this matter and said that there is a reason behind the evolution of any *bhava padarthas* and they exist for some time period and perform their respective functions and after that they die and in their death there are no reasons behind it¹⁸.

CONCLUSION

The concept of *swabhavoparamvad* plays an important role in maintaining our lives. Nothing is static in this world, everything is changing. Life and death are two sides of a coin, they both go simultaneously. Cells divide to form new cells, again undergo senescence then ultimately leads to cell death, this process continues throughout life. So, the main fact what we get from this concept of *swabhavoparamvad* is that homeostasis is necessary to maintain health, but natural death of every living object is inevitable. Our body naturally tries to be in homeostasis but natural death is bound to happen. So our cells adopt the mechanism of programmed cell death. All these process

together leads to aging and then death naturally.

Research is going throughout the world by applying this very concept of natural death in different types of cancer, so I hope may be someday we can get a solution to this deadly problem 'cancer'. Though continuing research on my topic I hope to provide answers to the fundamental questions related to this topic.

REFERENCES

1. Tiwari mamta et al/ IJRAP 4(1),Jan-Feb 2013. Review article, Ayurvedic approach for management of ageing and related disorder (Moksha publishing house)2013.
2. Shukla VD,Sutrasthan.Delhi: Chaukhamba Sanskrit Pratisthan.2007. Agnivesha. Charak Samhita.Vaidyamanorama. ch.16, sloka 27.p. 252.
3. Shukla VD,Sutrasthan.Delhi: Chaukhamba Sanskrit Pratisthan.2007. Agnivesha. Charak Samhita.Vaidyamanorama. ch.16, sloka 28.p. 253.
4. Shastri A, editor.Sutrasthan.varansi: Chaukhamba Sansthana; 2001. Sushruta, Sushruta Samhita, Ayurvedatatvasandipika; p.64.
5. Pساناسكار V.L, editor. Varanasi: Chaukhamba Sanskrit Pratishthan; 1995. Amar Singh, Amarkosha Raamashrami; p.388.
6. Shastri K, Chaturvedi G, editors. Sarirasthana. Varanasi: Chaukhamba Bharti Academy; 1998. Agnivesha, Charak Samhita, Vidyotini; p.192.
7. Shastri A, editor.Sutrasthan.varansi: Chaukhamba Sansthana; 2001. Sushruta, Sushruta Samhita, Ayurvedatatvasandipika; p.101.
8. Shastri K, Chaturvedi G, editors. Sarirasthana. Varanasi: Chaukhamba Bharti Academy; 1998. Agnivesha, Charak Samhita, Vidyotini; p.826.
9. Kirkwood T,Ebrahim S & Kalache A, Mechanisms of aging in epidemiology in old age, (BMJ publishing group, London), 1996,3.
10. Staurt Hamilton Ian, the psychology of aging; An introduction, (Jessica Kingley Publishers, London), 1998,1.
11. Elmore S (2007) Apoptosis: a review of programmed cell death. Toxiol Pathol 35: 459 -516.
12. Hengartner MO (2000) The biochemistry of apoptosis. Nature 407: 770 -776.
13. Pollack M, Phaneuf S, Dirks A, Leewenburgh C (2002) The role of apoptosis in the normal aging brain, skeletal muscle and heart. Ann NY Acad Sci. 959: 93 – 107.
14. Cabello j, et al. Cell Death Dis. 2014.PDR-1/hParkin negatively regulates the phagocytosis of apoptotic cell..... PubMed PMID :24625979 PMCID :PMC3973248.
15. Forbes sharine. Geriatric Medicine. <https://www.sharecare.com/healthy-aging/what-causes-aging>.

16. wiseGEEK : what is tissue homeostasis?
<https://www.m.wisegeek.com/what-is-tissue-homeostasis>.
17. Shukla VD,Sutrasthan.Delhi: Chaukhamba Sanskrit Pratisthan.2007. Agnivesha. Charak Samhita.Vaidyamanorama. ch.16, sloka 28.p. 253.
18. Dwivedi L,Varanasi: Chaukhamba Krishnadas Academy. 2012. Ayurveda ka moolbhut Siddhant. P.18.