Critical View of Jara and Process of Aging

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Abstract— Ayurveda consists of Ashtanga wherein Jara Chikitsa is one among it. Rejuvination therapy is also explained by modern science which deals with jara itself. Since nobody knows exactly why we age, there is no dearth of theories on the subject. Most of the theories fall in one out of two broad groups. Those which consider aging to be the cumulative result of random cell damage which goes on through out life, and those which consider aging to be the inevitable result of our genetic programme. The two groups of theories are not mutually exclusive. Possibly aging is primarily a genetically determined process, the rate of which can be modulated by environmental factors with a potential for damaging or protecting cells. Although the process of aging may be primarily genetic, scientists are more interested in the factors which can damage or protect cells because understanding these factors may give us the means of atleast retarding the process. Now we shall examine briefly the better known theories of aging.

Index Terms- Ayu, Jara, Genetics, Vardhakya, Balya etc

I. INTRODUCTION

Ageing is the process of becoming older. The term refers especially to human beings, ageing can refer to single cells within an organism which have ceased dividing or to the population of a species In humans, ageing represents the accumulation of changes in a human being over time, encompassing physical ,psychological and social changes. Reaction time, for example, may slow with age, while knowledge of world events and wisdom may expand. Ageing is among the greatest known risk factors for most human diseases of the roughly 150,000 people who die each day across the globe, about two thirds die from age-related causes.

The causes of ageing are uncertain. Current theories are assigned to the damage concept, whereby the accumulation of damage may cause biological systems to fail, or to the programmed ageing concept, whereby internal processes may cause ageing. Programmed ageing should not be confused with programmed cell death called apoptosis.

i)
ii)
iii)

The combination of *shareera,indriya,satwa* and *atma* is known as *ayu*, it possess synonyms of *Dhari,Jeevita,Nityaga* and *Anubandha*.[1]

Table-1 Life span at different time periods

Sl.no	Name of the *yuga*	Features
1	*Satyayuga*	At the time of starting this universe the average life span of individuals was 400 years. As the time passes on it started decreased as follows[2]
2	*Dwaparayuga*	300 years
3	*Tretayuga*	200 years
4	*Kali yuga*	100 years

In the present *kaliyuga*,the life span can bedivided in the following 3 stages.[3]
Balya ; 1-16 years.This has been subdivided in *Ksheerada* up to 1 yr,*Ksheerannada* up to 2 yrs,*Annada* up to 16 yrs
Madhya ;17-60 yrs
Vardhakya ; 61-100 yrs

The diseases arising out of temporal factors that bring about old age and death are to be considered as natural ones, and natural manifestations are irremediable.[4]

Age related changes ;
Age related changes may be observed at cellular as well as gross level.Cultured cells obtained from fetal cells go on multiplying much longer than those obtained from adult tissues .

Further cells from senescent cultures show a decline in DNA repair activity.The connective

Tissues throughout the body show an increase in stiffness of collagen fibers ,and also an increase in the rate of hydrolysis of elastin.

The systemic age related changes are broadly in the nature of reduced maximum capacity, reduced tolerance impaired peak performance or diminished reserve.The changes have been briefly discussed system wisebelow.[5]

Table-2 List of Systemic changes in old age

Systems	Changes
Blood	Haemopoietic marrow – gradually replaced by fatty marrow as age advances.This change occurs first in long bones& then in flat bones.Hence the physiological reserve capacity for erythropoiesis and leucopoiesis is possible reduced in elderly.
Respiratory system	The alveoli become flatter and shallower while alveolar ducts enlarge.The alveolar wall gets thinner and contains fewer capillaries.The alveolar surface area decreases by about 4% for every decade after the age of 30.Functionally there is a decline in total as well astimed vital capacity& an increase in residual volume in old age.Although reduced lung elasticity increases pulmonary compliance within the range of volumes associated with spontaneous breathing.The loss of elastic recoil makes the airways more susceptible to collapse, specially during expiration. The respiratory response to hypoxia &hypercapnea is also sluggish. Thus respiratory functions show an overall impairment of ventilation,diffusion as well as regulation
Cardiovascular system	Atherosclerosis is extremely common but is no longer considered an inevitableconcomitant of the aging process.But the high prevalence of atherosclerosis and its sequelae such as ischaemic heart disease & hypertension makes it difficult toseparate age related changes in the cardiovascular system from the effects of disease.However, studies on elderly individuals free of atherosclerotic disease have related that there are also purely age related structural & functional changes in the cv system.
Alimentary canal	The teeth show normal wear due to loss of first enamel & then even Dentine&cement.Teeth loss is invariably seen.Diminution in masticatory efficiency. Dysphagia is seen due to weakness of pharyngeal musculature& abnormal relaxation of cricopharyngeal muscle. In the stomach age related mucosal atrophy responsible for reduction in gastric secretion leads to achlorhydria.Reduction in pancreatic lipase leads to degenerative changes in pancreas.Constipation seen more commonly. There will be increase in size of hepatocytesand in fibrous tissue of liver.
Excretory system	Reduction in the weight of kidneys, Both the secretory &reabsorptive functions of renal tubules decrease,Age related renal changes are due to high proteincontent of most human diets.
Nervous system	Age related structural changes & deterioration of function seen in nervous system also.Atrophy of the brain,neuronal

	loss,Accumulation of lipofuscin in cells,loss of synapses & dendrites.Specifically,cholinergic defecit has been demonstrated in Alzheimer s disease and dopaminergic deficit in Parkinson s disease.
Special senses	Presbyopia,or impairment of accommodation of the eye,is such a constant feature after the age of 40 that one can almost judge the age of a person from the degree of Presbyopia.Intraocular pressure rises with age,Senile cataract has been referred to as an hereditary factor.The ear also shows diminished sensitivity. It is called as presbyacusis.Various age related changes in external,middle and inner ear are seen.These include thickening & loss of hair cells and supportive cells in the organ of corti,loss of neurons in the cochlea&auditory pathways.The sensations of taste and smell also decline with age.

Theories of Aging

All over the world,scientists from various branches like genetics,endocrinologists and immunologists are continuing their research for understanding various reasons why person becomes old? Although no definite cause is still known,various theories have been put forward.

I} The life span of all healthy tissues is predetermined ex; the fibroblast tissues in uterus multiply 50 times in the laboratory.

Ii}During the metabolic process,tissues are lost due to oxygen radicals and hence the waste products are formed. These are not climinated,hence old age sets in.

Iii}After certain time the cells develop AGE – advanced glycosylation end product .Hence they loose their elasticity and are responsible for old age.

CONCLUSIONS

1.Life span of a person has been changed as the time (*yuga*) changed.

2.As age progresses structural and functional changes appears in the body.

3.Many theories related to aging process are told but not proved .

4.By following Rejuvination therapies old age related problems can be delayed

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