



YOGA: HOLISTIC APPROACH INTO ANTIAGING & REJUVINATION

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Received on 20/04/2017

Accepted on 26/04/2017

Reviewed on 08/2017

Published on 22/05/2017

ABSTRACT

Aging is not merely the passage of time, but is the manifestation of biological events that occur over a span of time. In the world we are living in today, many people who have managed to live past 100 years, often answer: “I eat right, I sleep well and I don’t worry.” All this can be achieved if we overcome stress. Stress can be overcome by practising YOGA/ PRANAYAM, which has been proven to relatively decrease metabolic rate at rest and eventually increases the longevity of each cell and thus the life span of an individual. Stress and anxiety have become a normal part of modern existence. There is a need for individuals to adopt a stress-free routine in their schedule. Yoga provides what is often described as a ‘spiritual connection’ and aids in relaxation of the mind and body, reducing and improving overall levels of stress.

Keywords: Yoga, Pranayam, stress, aging

INTRODUCTION

One of the most fascinating areas of research and personal interest is the physiology of aging. Physiological aging refers to changes with the passage of time in the structure and processes of tissues, major organs and systems of the body that can ultimately affect our health, behavior, functional capacity and survival. Usual aging changes refer to the complex of changes that we typically see in individuals as they move into and through later life. Example of usual aging changes is increase in blood pressure, putting on weight, hearing loss, diminished vision etc. Whereas the inevitable changes are those that are universal, perhaps through being somehow genetically or biologically programmed or the unavoidable result of living through time^{1,2} example of inevitable physiological changes are hairs turning grey, scalp balding, appearance of wrinkles on the face etc. However, no disease has been connected with the changes of inevitable type of signs of aging³. Normal aging therefore constitutes the complex of physiological changes that occur in acceptable ranges, whether they are inevitable or usual changes of aging.

THEORIES OF AGING

Theories of physiological aging does provides clue to understand the process of aging as well as to develop interventions that can help slowing down deleterious effects due to aging and also to facilitate healthy cell and tissue functioning. Two major categories of aging are there under which major theories of aging falls:

- a) ERROR THEORIES OF AGING
- b) PROGRAMMED THEORIES OF AGING

Error theory of aging says that aging is external to the workings of the species.

Damage incurred from environmental assault, accumulates over time, and then causes the cell to malfunction or die. Programmed aging theories, on the other hand, says aging is internal to the species and is the natural and expected result of a purposeful sequence of events written into genetic code⁴.

That is:

The free radical theory of aging states that over time, cells accumulate oxidative damage caused by free radicals which are the normal by products of metabolism. Aging is characterized by a decline in ability to neutralize free radicals⁴

The rate of living theory states that lifespan is inversely related to metabolic rate. It appears to apply to many species; however a notable exception is birds.

Another theory suggests that lack of protein turnover may cause aging.

Evolutionary theories of aging suggest that the previous generation age and die to make way for their offspring, maintaining genetic diversity within the population.

According to the programmed aging theory, aging is genetically programmed, and age related changes in cellular function result in increasing susceptibility to disease and eventually lead to death⁴

Theories of aging based around programmed cell death (apoptosis) imply that as people age, more of their cells start to decide to die.

The cell division limit theory states that there is a specific limitation on the number of divisions that somatic cells might undergo.

The telomeric theory of aging postulates that as telomeres (regions of repetitive DNA at the ends of chromosomes) shorten each time a cell divides; this leads damage to essential DNA. This results in cellular damage due to the inability of the cell to duplicate itself correctly. Elevated levels of oxidative

stress and inflammation further increase the telomere attrition rate⁴. This theory ties in with the free radical theory and the cell division limit theory.

Other theories ascribe age related problems to the accumulation of random genetic errors over time, also decline in DNA repair capability of cells.

Many of these theories are interlinked, and all appear to have some validity, but a definitive answer has not yet been found.

THUS:

- ERROR THEORIES OF AGING is further categorized into:
 - i) Free Radical Theory
 - ii) Mitochondrial Theory of Aging
 - iii) Wear and Tear Theory
 - iv) Cross Linking Theory
 - v) Error Catastrophe
- PROGRAMMED THEORIES OF AGING is further categorized into:
 - i) Hayflick Phenomenon
 - ii) Telomerase Theory
 - iii) Neuroendocrine Theory
 - iv) Somatic Mutation theory
 - v) Dysdifferentiation Theory
 - vi) Immunological Theory

Environment does play a very important role and accounts for about 65% of variance in life expectancy⁵. The environment includes the range of factors to which the body is exposed, including food, water, heat, cold, noise, toxins, STRESS etc. The importance of the environment to life expectancy and quality of life in the next 100 years will mainly derive from improvements in lifestyle, rather than sanitation. What people eat, what they desire, where they live, whether they smoke or exercise etc. has a powerful impact on life expectancy.

Within the same individual, not all of the organs or tissues in the body ages,

or change at the same rate. Vision or lung function of an individual may change earlier or later than the other individual. Therefore the rate of aging is unique to every individual, depending on the environment/ or stress level one is exposed to or the way one handles it.

Homeostasis, which is the ability of a physiological system to function properly both at rest and when at stress. Virtually all older adults without advanced diseases can function sufficiently in a rested or non-stressed state. If homeostasis is compromised, the Functional Reserve is used to restore proper functioning; which refers to body's ability to respond to changes in the internal environment by recruiting more cells into action in order to restore homeostasis. If functional reserve is inadequate, the physiological system under stress, as well as co-dependent systems, fails to function properly.

Aging is associated with a reduced functional reserve capacity. So the body of an older person responds differently to the stress of acute illness, increased anxiety, or increased physical activity. It may simply be more challenging to the organs and systems of the older body to respond to an unusual physical demand. Compared with the older adult, a younger person will show less deviation from homeostasis and a faster recovery to baseline levels of functioning after a physiological stress of any type. Again the degree of functional capacity decline is slow with aging and varies among individuals.

Recent research indicates that many of the mild changes associated with aging can be prevented, attenuated, delayed- by improved lifestyle (Dincharya-ritucharya)
Physiological changes associated with aging: These include:

- a) Loss of muscle mass and tone, decreased muscle to fat ratio
- b) Loss of bone density

- c) Loss of flexibility, joint disorders such as arthritis
- d) Deterioration of lung elasticity and capacity
- e) Disorders of the circulatory system - decreased sensitivity of baroreceptors
- f) Degenerative disorders of nervous system - e.g. tremor, Parkinson's disease
- g) Sensory and cognitive impairment
- h) Psychiatric conditions - depression, anxiety, dementia
- i) Reduced immune function
- j) Reduced reserve capacity (slower recovery from exertion, injury or disease)
- k) Sleep disorders
- l) Impaired glucose tolerance and insulin sensitivity, strongly linked to abdominal obesity
- m) Further complications can occur as side effects of medication, or medication may mask symptoms of new diseases

ANTI-AGING INTERVENTIONS

Few interventions that have recently gained favour in slowing down the aging process, and in some cases even the diseases associated with aging:

- i) Oestrogen Replacement Therapy
- ii) Growth Hormone Replacement
- iii) Caloric Restriction
- iv) Exercise/ Yoga/ Pranayam

The most natural method amongst them to have anti-aging effect is exercise/YOGA/PRANAYAM & restriction of caloric food. During exercise/ YOGA metabolism increases, causing increase in steady blood flow through arteries, thus removing some fatty deposits from the blood vessel walls, also raises growth hormone levels. Regular YOGA/ exercise lowers resting metabolic rate, lowers build-up fat, raises HDL, lowers body weight and also improves cell repair. It is also associated with elevated levels of antioxidants ^{6, 7, 8, 9}

Ways in which regular exercise affects aging processes and morbidity⁴

1. CARDIOVASCULAR SYSTEM

Health Component	Usual Aging Change	Effects of Exercise	Effects on Morbidity
Blood Pressure	Increase	Maintains/Decreases	Lower risk of HTN
Cardiac Output	Decrease	Increase	Lower risk of CVD
HDL	Decrease	Increase	Lower risk of atherosclerosis
Triglycerides	Increase	Decrease	Lower risk of atherosclerosis

2. MUSCULOSKELETAL SYSTEM

Health Component	Usual Aging Change	Effects of Exercise	Effects on Morbidity
Muscle Strength	Decrease	Increase	Lower risk for Sarcopenia
Muscle Endurance	Decrease	Increase	Lower risk of Sarcopenia
Muscle Flexibility	Decrease	Increase	Lower risk of lower back pain
Bone Mineral Content	Decrease	Increase	Lower risk of osteoporosis

3. REGULATORY SYSTEM

Health Component	Usual Aging Change	Effects of Exercise	Effects on Morbidity
Blood Sugar	Increase	Decrease/ Maintain	Lower risk for Diabetes Mellitus
Metabolic Rate	Decrease	Increase	Lower risk of Obesity
Body Fat	Increase	Decrease	Lower risk of some types of cancer
Cognitive	Decrease	Increase	Lower risk of dementia

Function			
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Yoga is derived from the Sanskrit root 'yuj' meaning 'to bind', 'to join', 'to attach', 'to yoke' 'to direct and concentrate one's attention on', 'to use' and 'apply' It is true union of our will with the will of God. 'It thus, means,' says, Mahadev Desai, in his introduction to Gita according to Gandhi, 'The yoking of all powers of body, mind and soul to God; it means the disciplining of the intellect, the mind, the emotions, the will; which that yoga presupposes; it means a poise of the soul which enables one to look at life in all its aspects evenly'.

In the sixth chapter of *Bhagvada Gita* which is the most important authority on yoga philosophy, Sri Krishna explains to *Arjuna* the meaning of Yoga as a deliverance from contact with pain and sorrow. It is said "When his mind, intellect and self (*ahamkara*) are under control, freed from restless desire, so that they rest in the spirit within, a man becomes a *Yukta* – one in communion with God. He who has achieved it, shall not be moved by the greatest sorrow". *Bhagavada Gita* also gives other explanations of the term yoga and lays stress upon *Karma Yoga* (yoga by action). "Work alone is your privilege never the fruits there of. Never let the fruits of action be your motive; and never cease to work. Work in the name of the Lord, abandoning selfish desires. Be not affected by success/ failure. This equipoise is called Yoga".

Yoga has also been described as wisdom in work or skillful living amongst activities, harmony and moderation. 'Yoga is not for him who gorges too/ much, nor for him who starves himself. It is not for him who sleeps too much, nor for him who stays awake. By moderation in eating and in resting, by regulation in working and by concordance in sleeping and waking, yoga destroys all pain and sorrow'.

Kathopanishada describes yoga: "When the senses are stilled, when the

mind is at rest, when the intellect, say the wise, is reached to the highest stage, this steady control of the sense and mind has been defined as yoga. He who attains it is free from delusion".

Yoga is a 5000-year-old ancient Indian way of life, which includes changes in mental attitude, diet and the practice of specific techniques such as yoga *asanas* (postures), breathing practices (*pranayama*) and meditation to attain the highest level of consciousness¹⁰. *PRANAYAM* is the connecting link between physical (*asanas*) and mental (meditation) yogic practices.

Pranayama is a Sanskrit word which consists of *prana* and *ayama*. Prana means self-energizing life forces and ayama means extension. Pranayama may be defined as expansion and control of prana through various yogic techniques. In a simple way, we can say that pranayama is a combination of systematic exhalation and inhalation.

Difference between Pranayama and breathing

There is a difference between pranayama and breathing process. Pranayama is not a simple breathing process; it is much more than exhalation and inhalation. Pranayama is a regulated breathing, which comprises *puraka*-slow and prolonged inhalation, *kumbhaka*-retention of breathe, and *recaka*-slow and prolonged exhalation. While breathing involves inhalation and exhalation. Pranayama is always performed in specific posture, especially sitting in *padmasana* while in case of breathing, it is not so like that. Breathing provides physical benefits while pranayama involves physical, mental and spiritual benefits.

Top benefits of breathing exercise Pranayama

1. Pranayama controls ageing.
2. Pranayama makes oxygen circulation smooth, helps in weight regulation by

melting fat as more oxygen burns more fat.

3. Pranayama is the key of Intelligence.
4. It provides lightness to the body; acts as diseases destructor, brings vigour and power.
5. Pranayama helps in lungs expansion thereby improves its efficiency and makes it healthy.
6. It also helps in contending blood pressure and heart diseases; makes digestion smooth.
7. It cures the phlegm, mucus and tonsillitis problems. Makes your gums and teeth healthy.
8. Pranayama brings stillness and calmness to the mind, increased concentration and stability of mind. Pranayama is good for physical, mental and spiritual happiness.
9. It makes you free from constipation and indigestion problems.
10. Pranayama stimulates autonomic nervous system, sympathetic nervous system and parasympathetic nervous systems. It helps to ease stress, anxiety and tension. It also eases depression, dullness and lethargy.

As aging happens in each cell of the body, evidence shows an improvement in tissue functioning and improved glucose control with the practice of yoga/ pranayam. Tissue glycation and peripheral glucose control can be influenced by regeneration of cells in the liver and pancreas¹¹. With poses that build strength and flexibility in the muscles, enhanced blood flow and insulin receptor expression on the muscles result in increased glucose uptake and hence reduced blood sugar^{12, 13}. The improvement in lipid levels after yoga could be due to increased hepatic lipase and lipoprotein lipase at the cellular level, which affects the metabolism of lipoprotein and thus increases uptake of triglycerides by adipose tissues^{14, 15}. There is an overall improvement in metabolic functioning of the cells and tissue, thus having an anti-aging effect.

CONCLUSION

The practice of yoga with a 'yogic attitude' (patience, persistent practice and realizing the self) one should be able to reduce laziness, anger, delusion and desire for being different or better than others. Through expressing improved self-image and ahimsa (nonviolence to the self) there is an overall improvement in the quality of life and mood of the individual. The evidences supporting the antioxidant cellular and tissue effects of yoga discovered in the recent decade are intriguing and warrant more studies with a larger population base. Certain yoga postures such as twisting, binding and certain back-bend positions according to ayurveda are suggested to help proper flow of the prana ('life force') and help detox the body. Pranayama, one of the important vital components of Yoga directly or indirectly affects the proper functioning of different systems of the body. Practicing pranayama regularly, shows beneficial impact upon respiratory system, circulatory system, digestive system and endocrine system. Pranayama ensures more oxygen to lungs and good for heart too. Pranayama tones up kidney and control the functions of nervous system. Kumbhaka or retention of breath helps supply of oxygen or exchange of oxygen and carbon dioxide thus facilitates better work of lungs and helps brain to work more efficiently. Pranayama affects autonomic nervous system which controls heart rate, glandular secretions, respiration, digestion and blood pressure. Thus has a positive effect on aging.

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Source of support: Nil
Conflict of interest: None Declared