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AGING AND SPORTS INJURIES

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ABSTRACT:
Every organism grows, attains maturity and then becomes old and senile. Death comes as the end result of old age. With the advancement of age after maturity the body of an individual undergoes certain gradual changes. These are decline in the metabolic efficiency, the power of replacing the worn out cells, repairing the damaged tissue, organs and organ system which become functionally inefficient, and all living organisms live through a span of time and then die. Some live for a long period and some for not so long. Some may die very young while some may continue on for centuries. It is believed that Hydra is an exception, is an immortal creature being not subjected to ageing. (Interstitial cells, (Brein 1952. Exceptional injuries are common among the elderly, and are connected mostly with degenerative aging processes. Acute injuries are common in those elderly people participating in sport activities which demand high coordination, reaction time, and balance capabilities, such as ball games, down-hill skiing, and gymnastics. Muscle has been reported to be the most commonly acutely injured tissue among active elderly athletes. In treating elderly people, it is most important to avoid the detrimental effects of immobilization; this requires active treatment and rehabilitation with compensatory exercise therapy. The best 'treatment' for sports-related injuries is prevention. Good agility, technical skills, and cardiovascular and musculoskeletal fitness are important in injury prevention among the elderly.

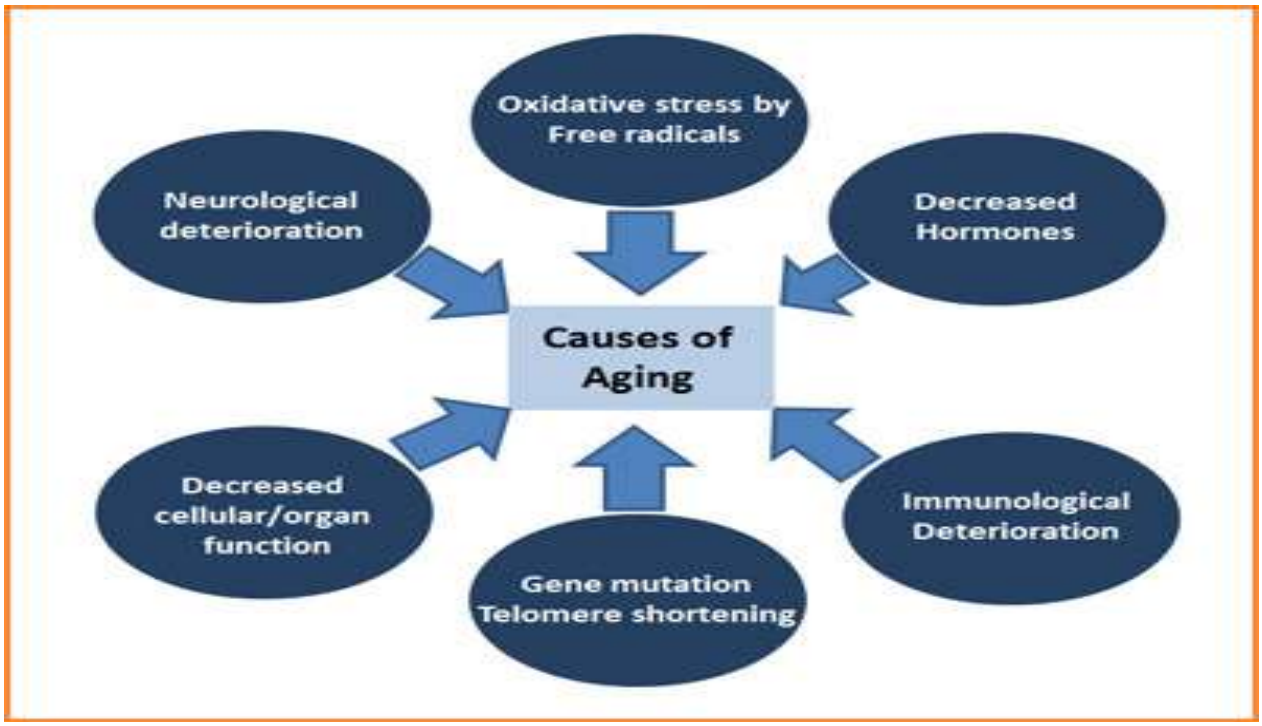
KEYWORDS: Aging, Metabolic, Efficiency Morphological and Physiological**.**

INTRODUCTION:
Every organism grows, attains maturity and then becomes old and senile. Death comes as the end result of old age. With the advancement of age after maturity the body of an individual undergoes certain gradual changes. These are decline in the metabolic efficiency, the power of replacing the worn out cells, repairing the damaged tissue, organs and organ system which become functionally inefficient, all living organisms live through a span of time and then die. Some live for a long period and some for not so long. Some may die very young while some may continue on for centuries. It is believed that Hydra is an exception, is an immortal creature being not subjected to ageing.(Interstatial cells,(Brein 1952. Illness and aging both cause many structural and practical alterations in the human body, representation elderly people liable to overloading of the musculoskeletal and cardiovascular systems. It should, however, be kept in mind that immobilization and immobility have even more harmful effects on structures and functions in the elderly than in younger adults. Most physically active elderly people are selected individuals with respect to their superior health and physical capacity compared with stationary persons of the same age, thus making it possible to further improve their physical capacity. Exceptional injuries are common among the elderly, and are connected mostly with degenerative aging processes. Acute injuries are common in those elderly people participating in sport activities which demand high coordination, reaction time, and balance capabilities, such as ball games, down-hill skiing, and gymnastics.
Muscle has been reported to be the most commonly acutely injured tissue among active elderly athletes. Some of the injuries are, however, long term and cause disability not only during training and competition, but also in the normal activities of daily living. It is important that these injuries are treated as soon as

possible and in the most effective way, similarly to injuries suffered by younger people. In treating elderly people, it is most important to avoid the detrimental effects of immobilisation; this requires active treatment and rehabilitation with compensatory exercise therapy. The best 'treatment' for sports-related injuries is prevention. Good agility, technical skills, and cardiovascular and musculoskeletal fitness are important in injury prevention among the elderly. proper training programmes, the use of safe and familiar equipment, careful warming up and cooling down, multiphasic training [including the training of neurophy siological functions (balance, coordination and reaction time)] and muscle strength are essential aspects of injury prevention. Aging is a complex, dynamic, sociocultural, psychological, and biological process. Gilleard and Higgs (2000) argued that "ageing has become more complex, differentiated and ill-defi ned, experienced from a variety of perspectives and expressed in a variety of ways at different moments in people's lives". Older people are commonly not recognized as acceptable or normal subjects of performance discourses because they are traditionally positioned as weak and less able. Yet the number of older people participating in physically demanding competitive sports is increasing.

THE PHENOMENON OF AGING:

Aging and ultimate death seem characteristics of all living organisms. Atherosclerosis progressively decreases the tissue oxygen supply, and in some organs such as the brain, cells that die are not replaced. In other tissues, the cell constituents change with aging; for example, cross-linkage develops between adjacent collagen fibrils, decreasing their elasticity and facilitating mechanical injury. In consequence, most biological function shows a progressive, age-related deterioration.



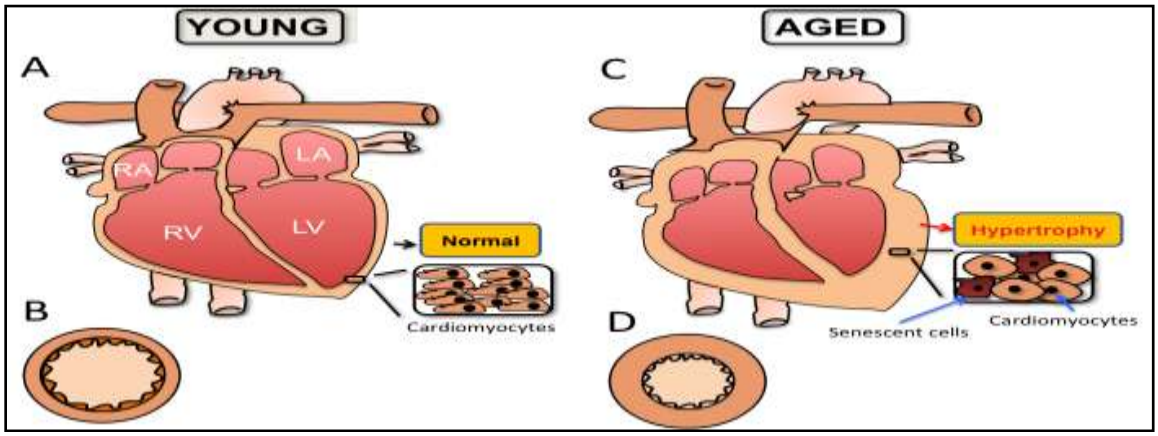
CHANGES WITH AGE:

1. **PHYSICAL CHANGES:**

HEART:

- Age brings a decrease in maximum heart rate and an overall decline in maximum cardiac output, or the amount of blood the heart can pump, both of which limit athletic performance.
- When younger athletes exercise, the size of the muscle in the walls of the heart chambers increases.

- This, in turn, enhances the force with which the heart can pump, producing a higher cardiac output and, therefore, a lower heart rate. In older athletes, heart muscle size is not increased by exercise to the same degree.



- Aging leads to a decrease in overall lung capacity and a decline in the ability of the lungs to move oxygen from the air into the bloodstream.
- This means less overall strength and endurance.

MUSCLES:

- We age; we lose both muscle strength and muscle mass. Decline in muscle mass is known as sarcopenia (from the Greek for "loss of flesh").
- Most of the muscle lost from sarcopenia is what is known as Type IIa, or "fast-twitch," muscle fibers.
- Human muscles are classified as either Type I or Type II. Type I muscle to contract and contribute to les are physical endurance; Type II muscles are faster to contract and are associated with strength and power.

2. MORPHOLOGICAL AND PHYSIOLOGICAL CHANGES:

a. Old man and woman with thin, shrivelled and stopping body and dry wrinkled skin.
b. With age efficiency of heart to pump blood drops with advanced age cardiovascular response to stress becomes inefficient, coronary artery sclerosis and physical disability i.e being out of shape.
c. The brain and kidneys receive far less blood.
d. The blood circulating through lungs decreases.
e. Bone marrow produces far less RBCs.
f. Cells loose the capacity of retaining water, tissues become drier.

THE VOLUME OF BLOOD IN BODY DECREASES:

a. Manifestation of these changes as the individual grows older is known as ageing.
b. Thus ageing may be defined as the deterioration in the structure and functions of body cells, tissues and organs.
c. The branch of Biology dealing with the study of process of ageing is known as gerontology.

3. CELLULAR CHANGE:

Chromosomal abnormalities & gene mutation in the nuclei of body cells are very important change due to ageing liver cells exhibit increased number of chromosomal aberrations with the increasing age the enzyme. Adolescence becomes more & more inactive. Formation of defective proteins

Pigment accumulation loss of power of cell division, especially in muscles is conspicuous changes in the cells due to ageing. With the advanced age, the body cells gradually lose the power of multiplication.

i. Ageing causes considerable cells deaths in nerve tissues (About 90% of nerve cells in the brain die at the age of 70) which effects memory.
ii. Power of hearing become less acute (after the age of 10 years)
iii. Egg production of menstruation ceases (menopause)
iv. Rapid coordination of body part decline.
v. The biological process of ageing is faster in human males the then in human females.

4. EXTRACELLULAR CHANGES:

i. Collagen, one of the important extra-cellular proteins, when young is permeable, flexible and easily soluble.
ii. Ageing makes it less permeable, rigid and insoluble.
iii. Thus they obstruct the diffusion of materials in and out of the cells of the tissues, resulting in deterioration of cell functions.
iv. Collagen, one of the important extra-cellular proteins, when young is permeable, flexible and easily soluble.

SUMMARY AND CONCLUSIONS:

These are factors previously associated with tibial loading and stress fractures. Males and females do not differ on these factors suggesting older female runners may be at no greater risk than younger runners or male runners for lower extremity bony injury based on normal mechanics. The best 'treatment' for sports-related injuries is prevention. Good agility, technical skills, and cardiovascular and musculoskeletal fitness are important in injury prevention among the elderly. Proper training programmes, the use of safe and familiar equipment, careful warming up and cooling down, multiphase training [including the training of neurophy serological functions (balance, coordination and reaction time)] and muscle strength are essential aspects of injury prevention. Structural and functional changes in muscle during aging occur in a wide range of species, ranging from C. elegans to humans. The structural changes include a reduction in muscle mass and muscle fibers, and a shift of muscle fibers toward type 1 fibers. These structural changes are associated with muscle weakness, reduced endurance capacity, and insulin resistance. Muscle weakness is largely related to reduced mass but the muscle strength per unit mass of muscle also declines. A reduction in the synthesis rate of MHC, the key protein in the contractile apparatus, is likely to contribute to the muscle weakness. Myosin is deficient in the muscle of C. elegans, which reduces its locomotion. It remains to be determined whether the concentration of myosin and other key proteins involved in muscle contraction are reduced with aging in humans. In long-distance runners and in animal studies, type 1 fibers are rich in mitochondria and are relatively fatigue resistant. In contrast, the relative increase in type 1 fibers does not make older muscle fatigue resistant, perhaps because of a reduction in mitochondrial content with age. A reduction in mitochondrial ATP production could contribute to reduced endurance and muscle weakness.

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