



Effect of Aging on Musculoskeletal System and Role of Exercises in Geriatrics

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Aging is inevitable and so as age related physiological changes. The rate of aging is variable for every individual and can be slow down up to some extent. This rate of again depends on several factors such as gender, preexisting comorbidities, level of physical activities, on going medicines etc.

Aging defiantly plays a role in one's quality of life. With age physiological degradation in structural and function of bodily system occurs hence level of physical fitness is lowered in a geriatric compare to an adult. This can be considered as a primary reason for this alteration in quality of life [1]. According to literature the age-related physiology changes occur in all bodily system but at different extent e.g. the rate of changes is higher in Cardiovascular, Musculoskeletal and Reproductive system compare to gastrointestinal system, Endocrine system etc. Fitness training and Geriatric rehabilitation can play an important role in slowing down the ageing process and improving quality of life of elderly [2,3]. In this paper the age-related changes in musculoskeletal system and effects of exercises on aging musculoskeletal system is discussed.

The musculoskeletal system comprises of bones, muscles and tendons, cartilages and ligaments, joints. The bones are most affected part of body with age. The most significant change is density of bone decreases and the rate is higher in females then males. The fracture of femur is most common among other

fractures. Some of the changes in Musculoskeletal system due to aging are described in table 1 [4,5].

Changes in Bones	Changes in Muscle and Ligaments	Other changes
Bone mass, density reduces	Skeletal muscle mass Declines	Impaired capacity of skeletal muscle to incorporate amino acids
Loss of cortical bone	Sarcopenia, Loss of muscle fibres	Impaired capacity of protein synthesis
Imbalanced osteoblast and osteoclast activity	Loss of motor units increases	Stooped posture
Thinning of trabeculae system	Decreases force of contraction of muscle	Walking speed decreases
Fibrillation of cartilage occurs and cartilage becomes thinner	Slower neuromuscular contractile properties	Decreased in height due to loss in bone mass in vertebrae
Increased chances of fractures	Increases rate of fatigue	Base of support increases and Centre of mass decreases
Increase chances of osteoarthritis and osteoporosis	Slow and sluggish muscular movements	Risk of fall increases

Table 1: Effect of aging on Musculoskeletal system.

The effect of various exercises such as aerobic exercises, resisted exercises etc have been evaluated in elderly. The most recommended exercises prescriptions by American college of Sport Medicines and others are shown in table 2.

Component	Aerobic exercise	Resisted exercises
Frequency	5 days/week	2-3 days/week
Intensity	Moderate intensity (5-6 on scale of 0-10 Borg Scale)	Moderate intensity
Time	30-60 minutes /Day	2 to 3 sets/Day
Type	Low joint strenuous activities such as walking, swimming	8 to 10 different exercises of the major muscle groups

Table 2: Recommended Exercises Prescription for elderly [6,7].

Flexibility exercise: 2 days/week holding large muscle 30 to 60 seconds, Balance Training: 2 to 3 days/week, Volume: Total 150 minutes/week of moderate intensity exercise.

The exercises session should be incorporated with efficient warm up and cool down period for every session to prevent undesirable effects of exercises, the aerobic exercises will improve bone health and muscle mass. It increases the ability to resist fatigue. Aerobic exercise is also believed to improve vascular competence. This effect increases level of independence of an individual. The resisted training has a significant impact of reducing muscle fibre loss and slowing down bone loss, it enhances the quality of movement and the improved muscle control of lower limb. The balance training and flexibility training improves balance and plays a role in improving balance that decreased the risk of fall and reduces chances of fracture. Exercises improves postural stability and control. [2,9].

Conclusion

Ageing is not any disease and it's not preventable. Aging is a phase of a life of an individual. Because of plenty of reasons the quality of life gets affected in elderly. There are ways to slow down age related physiological deterioration such as exercises. Hence the exercises should be made an integral part of routine in elderly. Other than exercises, yoga, diet modifications, cognitive trainings, environmental modifications and others such as use of assistive devices, increase the quality of life on elderly and can make living worth [9-13].

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