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Study to Assess Scapular Dyskinesia in Older Adults of Ahmedabad

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ABSTRACT

Background: A big proportion of older citizens are more vulnerable to aging, which leads in poor health and degenerative changes in various joints, which, when combined with muscle mass loss, makes daily activities harder for the elderly. Muscle mass and strength significantly deteriorate with age. The muscles that surround the scapula in the upper limb offer proximal stability during ADL activities. The muscle atrophy around the scapula makes the ADL action unsteady. The survey was carried out to assess scapular Dyskinesia in elderly Ahmedabad residents.
METHODOLOGY: 40 Older peoples, above the age of 60 years old male were selected by convenient sampling. An observational study was conducted. Participants was selected according to inclusion and exclusion criteria. The modified lateral scapular slide test assessed individually and measure the difference scapular position in three different positions.
RESULT: The participant mean age was 69.65 years, with 40 male people were evaluated. In general, the modified lateral scapular sliding test was used to assess older persons in Ahmedabad for scapular Dyskinesia. In which we discovered three sites of scapular Dyskinesia. In position 1, 62.5% of participants had a discrepancy of more than 1.5 cm. In position 2, 52.5% of people had a discrepancy of more than 1.5 cm. In position 3, 55% of people had a discrepancy of more than 1.5 cm.
CONCLUSION The average 62.5% of older people had scapular dyskinesia.

Keywords: Scapular Dyskinesia, modified lateral scapular slide test, older people.

INTRODUCTION

Aging is a multifaceted and intricate process that is difficult to define precisely. However, it is commonly acknowledged as a gradual and cumulative series of detrimental changes to physiological functions, ultimately resulting in death.[1] Aging is a natural and intricate process influenced by a variety of factors. These factors can be categorized as internal, such as genetic predispositions, and external, encompassing psycho-social and environmental influences. Furthermore, diseases can also contribute to the progression of aging.[2] Extensive exploration into this complex phenomenon has demonstrated that aging is influenced by a combination of biochemical and genetic factors, observed in humans as well as model organisms, and compounded by environmental variables such as dietary behaviors.[3]

The concept of old age is evolving, particularly in developing countries where the average life expectancy exceeds 80 years. Gerontologists categorize the elderly as younger adults (60-74 years), older adults (75-85 years), and extremely old individuals (>85 years) [4]. A different class of genes involved in aging is associated to the creation and scavenging of molecules

known as reactive oxygen species (ROS), offering another basis for adoption of the mechanistic theory of aging, or the free radical theory. [5]

Mitochondria serve as the primary producers and recipients of reactive oxygen species (ROS) within cells, implicating them in the aging process via oxidative stress and resultant mitochondrial damage. Studies have consistently shown a decline in mitochondrial function associated with aging and various degenerative diseases, underscoring the significance of antioxidant systems and dietary nutrients in potentially mitigating the effects of aging. Understanding the intricate interplay between mitochondrial function, oxidative stress, and aging holds promise for the development of interventions aimed at promoting healthy aging and combating age-related diseases.[5,6]

As individuals age, cognitive function, cardiovascular health, muscle strength (sarcopenia), and neuromotor function (dynapenia) tend to decline. This decline often results in a loss of independence among the elderly due to neurodegeneration, diminished muscle strength, and increased physical fatigue. Addressing these multifaceted health challenges is crucial for maintaining independence and overall well-being in older individuals, highlighting the complex nature of aging-related change. [7]

In developing countries like India, improvements in public health, the management of infectious diseases, and advancements in medical technology have led to a decrease in mortality rates. Consequently, there has been a notable rise in the proportion and absolute number of senior citizens. Over time, the geriatric population has seen significant growth, with older adults now constituting 11.1% of the population. This figure has surged from 24.7 million recorded in the 1961 census to an anticipated 137.9 million in 2022 and 158.7 million by 2025.[8]

Regrettably, a significant portion of the elderly population is increasingly vulnerable to the effects of aging, leading to compromised health and degenerative alterations in multiple joints. When coupled with the loss of muscle mass, these changes significantly impede the ability of older individuals to carry out daily activities[9]. The decline in muscle mass and strength is evident as we age, with between 16.6% and 40.9% of adults aged 40 and above experiencing a reduction in muscle strength.[10] In seniors aged 60 and older, muscle strength typically diminishes by 1.5-3.5% annually.[11]

The shoulder complex encompasses the glenohumeral, acromioclavicular, and scapulothoracic joints, offering the widest range of motion in the body. Proper shoulder function relies on the optimal positioning and movement of the scapula, as it plays an integral role in the shoulder complex. Deviations from normal scapular motion and position, known as scapular dyskinesis, often manifest as shoulder disorders. Hence, preventive measures, treatments, and the design of clinical assessments for shoulder rehabilitation should prioritize addressing scapular position and movement.[12]

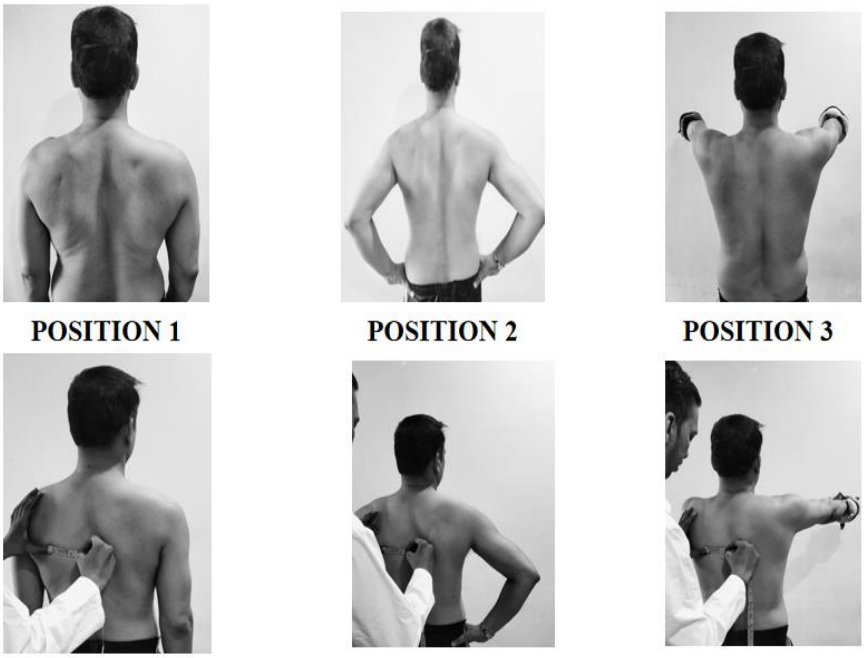
As individuals age, there is a gradual decline in muscle strength, muscle tone, muscle mass, and basal metabolic rate, leading to reduced overall physical strength. Furthermore, decreased spinal flexibility and joint mobility contribute to postural issues such as stooping, impacting alignment. The scapula serves as a crucial link between the upper limb and trunk, and its position and stability play a pivotal role in spinal alignment and trunk stability against gravity. Weakness and dysfunction in the muscles surrounding the scapula can lead to postural changes in the trunk, cervical and thoracic vertebrae, impairing balance and functional mobility.[13]

MATERIALS & METHODS

This is an observational study where 40 older peoples were selected by convenient sampling. Ethical clearance has been taken from the Ethical committee of the institute. subjects were selected according to the

inclusion criteria and Exclusion criteria. Inclusion criteria are 1) Male Subjects 2) Age above the 60 years 3) Willing to participant on study. And Exclusion Criteria are 1) Metabolic Disorders Like Diabetes, 2) Postural Deformity Like Scoliosis. 3) Neurological Disorders 4) Underwent surgery (6 month).

To measure the scapular Dyskinesia modified lateral scapular slide test (MLSST) were used in standing position. This started by identifying the spinous process of the 7th cervical vertebra (C7) as described by da Costa, et al. (2010). After identifying C7, raters palpated the spinous processes of the vertebrae down to T7 and then marked it with a tag. Then, they measured the distance between the inferior angle of the scapulae and the spinous process of T7 with the measuring tape in 3 different arm positions on both the side. The first position was with the arms by the side. The second was with the subject's hands on the hips, and the third was with the arms elevated to 90º of shoulder abduction in scaption with maximal internal rotation and 1kg load hold in their hand. For the diagnostic accuracy of the MLSST A difference of 1.5 cm or greater in any of the 3 positions was considered a positive result of the LSST.[14,15]



RESULT

The study included forty male elderly individuals (n=40).

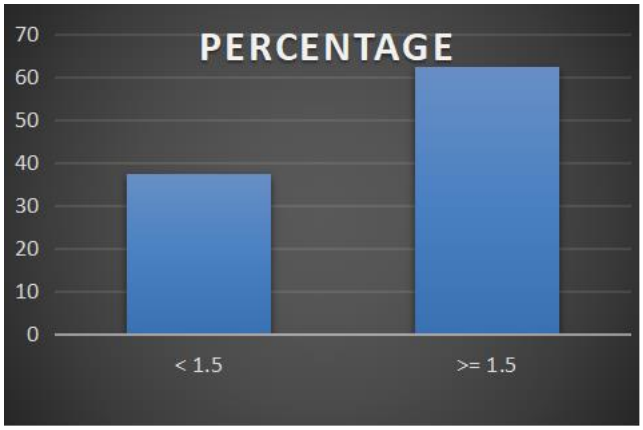
Mean And Standard deviation of the height, Weight and BMI of Subjects Are Given in Below Table 1.

Demographics	Mean ± SD
Height(meter)	1.672 ± 0.0818
Weight(kg)	69.65 ± 6.904
BMI (kg/m2)	25.17 ± 3.67

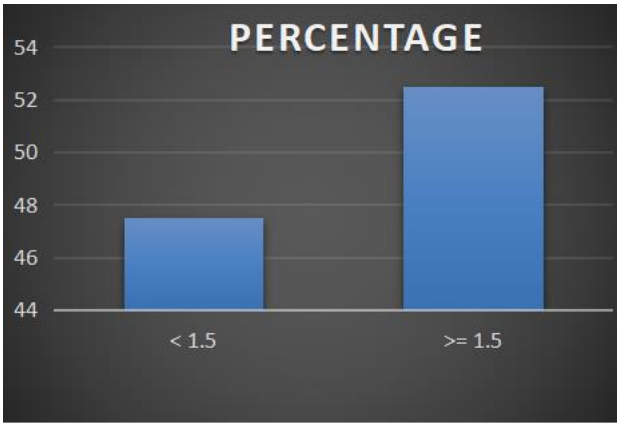
The test revealed three Position of scapular Dyskinesia. In the first position (Graph 1), 62.5% of participants exhibited a discrepancy of more than 1.5 cm, while in the second position (Graph 2), 52.5% did, and in the third position (graph 3), 55% had a discrepancy exceeding 1.5 cm.

Table 2 - It shows the percentage of older male having a scapular Dyskinesia in three different Position.

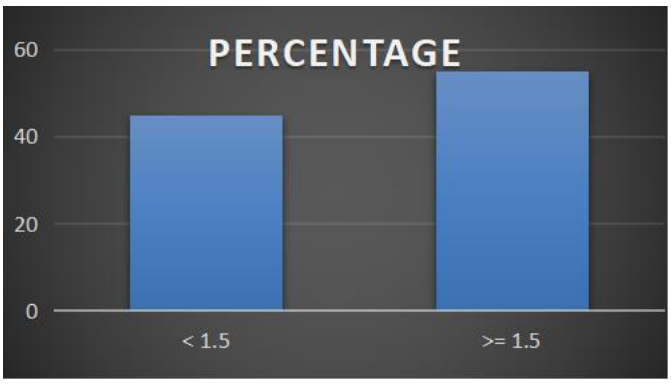
	<1.5 CM	>1.5 CM	PERCENTAGE
POSITION 1	15	25	62.5
POSITION 2	19	21	52.5
POSITION 3	18	22	55



Graph 1



Graph 2



Graph 3

DISCUSSION

The present study was to assess the scapular Dyskinesia in older people of the Ahmedabad. And result shows that the majority of the older people have scapular dyskinesia. We assess the scapular Dyskinesia in three different positions by measuring the distance from T7 spines process to lower angle of the scapula which is called as Modified lateral scapular slide test. In result shows that the in position 1

most of the subjects has discrepancy of 1.5 cm rather than the position 2 and position 3.

Samal GN et al. conducted a study to assess the scapular Dyskinesia in 30 cricket players by using the lateral scapular slide test. And concluded the Prevalence of scapular dyskinesias was present in 10% of total participants. [16]

Kawena Dhami et al conducted a study to Assess Scapular Dyskinesia in Healthy Individuals Aged 25-35 Years. The study was conducted on 100 healthy individuals by using lateral scapular slide test. The study was mainly found out the scapular Dyskinesia in healthy individual which is mainly result of the covid pandemic and various lockdown. Healthy individual performing desk jobs or working from home have the result of scapular Dyskinesia. And study Concluded that the 60 % people have the scapular dyskinesia. [17]

Depreli O et al. conducted a study to assess the scapular dyskinesia 36 office workers by using the Lateral scapular slide test. And they concluded the high incidence of scapular dyskinesia in office workers.[18]

CONCLUSION AND CLINICAL IMPLICATION

- After testing scapular dyskinesia in elderly persons in Ahmedabad, it was discovered that 62.5 % of participants had scapular dyskinesia.
- The clinical implication is focus more on that improving scapular strengthening exercise and improve the ADL activity of older adults.

Declaration by Authors

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