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A STUDY TO ANALYZE CORRELATION BETWEEN FEAR OF FALL AND ITS RISK FACTORS IN COMMUNITY-DWELLING OLDER ADULTS

Vadivelan Sundaramurthy* Grace Helina**
**Ph.D Scholar, Department of Exercise Physiology – TNPESU.*
***Professor & HOD, Exercise Physiology – TNPESU.*

Background: *Older people who have suffered a fall are at increased risk of falling again. Falls are the leading cause of injury-related hospitalization in persons aged 65 years and over. Many factors were originally considered as possible risk factors for falls based on review of currently available literature. The aim of this study was to explore the relationship between fear of fall and risk factors of falls.*

Methodology: *This study included hundred older adults subjects, age 65 and above. They were asked to express their overall feel of fear of falling by Visual Analog Scale. Other risk factor variables are assessed and documented by Joint Position Sense test for Proprioception, Time Up and Go test for Functional Mobility, Sit and Reach test for Flexibility, Berg Balance Scale for Balance and Goniometric assessment for Ankle Range of Motion.*

Results: *The study reveals fear of falling has a strong negative correlation with balance (r -0.85, P<0.001), ankle dorsiflexion (r -0.54, -0.56, P<0.001), flexibility (r -0.52, P<0.001) and small negative correlation with ankle plantar flexion (r -0.28, P<0.05). The functional mobility and proprioception have a strong positive correlation (r 0.732, P<0.001) and moderate positive correlation (r 0.45, p<0.001) with fear of falling respectively.*

Conclusion: *This study concluded that the fear of fall in older adults is strongly associated with balance, flexibility, ankle range of motion, functional mobility and proprioception.*

Key Words: Fear of Falling, Older Adults

Introduction

Falls are the leading cause of injury-related hospitalization in persons aged 65 years and over, and account for 4% of all hospital admissions in this age group. In people over the age the age of 65 years, falls are the leading cause of death from injury. Falls also lead to substantial morbidity among older adults. Nearly 70% of all emergency department visits by people over the age of 75 years are related to falls. According to the World Health Organization (WHO) global report on falls prevention, people aged 65 years and above fall about 28%–35% in each year and this proportion increases as age and frailty level increase. The prevalence of falls in India, above the age of 60 years, reported to range 14%–53%.

Many factors were originally considered as possible risk factors for falls based on a review of currently available literature. These factors include age, number of chronic diseases. body composition, muscle strength, functional mobility and performance measures related to balancefunction.Impaired balance and functional mobility are major risk factors for falls. Since falls and its consequences have a major role in quality of life, rehabilitation programs, which aim to decrease the risk of falling by considering all contributing factors such as muscle strength, flexibility and balance, have the potential to both decrease the risk of falling and improve the quality of life.

Falls may be traumatic or non-traumatic. Even a fall without trauma has got a negative impact on the older adults and it sometimes instill fear of fall in them. In addition, falls may also lead to a post fall syndrome which includes dependency, loss of autonomy, confusion, immobilization, and depression, which will engender to a further restriction in daily activities. Overall, falls contribute to increase the risk of future fall thus affecting the quality of life. Due to this interaction, the relationship between fear of fall and its risk factors becomes significant. Based on a review of literature, this study was designed to explore the relationship between fear of fall and its risk factors (balance, functional mobility, proprioception, muscle strength, flexibility and fear of falling) in older adults.

Method

A total of 100 (53 men and 47 women) participants aged 65 or older with or without a history of falls were recruited from the various old age home near Cuddalore and houses of old age persons willing to participate in this study. Ambulatory individuals having no disability in self-care formed the population of this study and a report stating sound mental health was required at the registration of all participants. The exclusion criteria were as follows: being aged less than 65, being unable to walk less than 10 meters, amputation, having had a stroke recently, unstable medical conditions, 2 or more fractures due to osteoporosis, resting angina, recurrent heart failure or recurrent arrhythmias and uncontrolled seizure disorder.

Procedure

Fear of fall by Visual Analog Scale: They were asked to express their overall feeling of fear of falling by drawing a mark on a vertical line of exactly 10 cm connecting the two statements 'No Fear of Falling" (Below) and Very Afraid of Falling (Above). The score was the number of centimeters between No fear of falling and the subject's mark.

Balance: The Berg Balance Scale (BBS) was used to evaluate balance. The BBS is a 14-item balance assessment tool that is scored on a 5 point ordinal scale (0–4) measuring levels of ability in performing each task (4 = safe and independent, 0 = incapable). The BBS includes tasks such as standing with eyes closed, reaching, standing on one foot and picking up objects from the floor. The highest total possible score on the Berg Balance Scale is 56, indicating excellent balance.

Functional mobility: The time up and go (TUG) test was used to measure basic functional mobility. The time taken to complete rising from chair, walking ten feet (3 meters), turning, walking back to the chair and sitting was recorded in seconds. The starting position was standardized so that the subjects commenced the test with their feet flat on the floor and their arm resting on arm rest. No physical assistance was given.

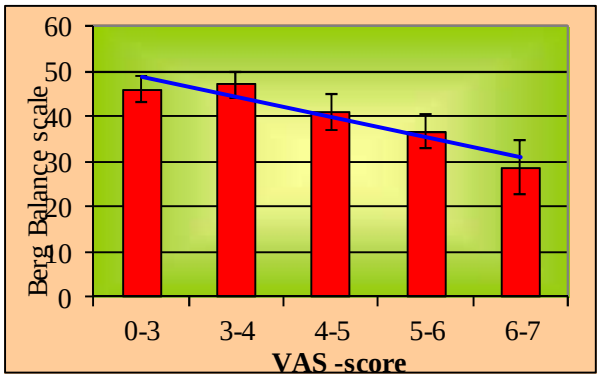
Flexibility: In order to assess flexibility, a sit and reach test was used. A box 32 cm in height and 50 cm in length with a top plate 45 cm in width was used for the test. The length of the top plate was 75 cm, the first 25 cm of which was extended over the front edge of the box towards the subject feet. Older adults were asked to sit keeping their knee straight, and reach forward as for as possible from a seated position. The score was determined by the furthest position they reached with their finger tips on a scale.

Ankle Range of Motion*:* Measurements of ankle dorsiflexion and plantar flexion were measured by goniometer in high sitting position.

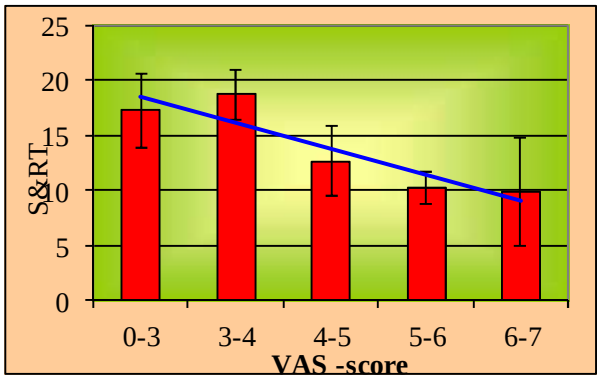
Proprioception*:* Proprioception was assessed using established and validated lower limb matching test. In this test subjects seated with their eyes closed were asked to align their lower limb simultaneously on either side of a vertical clear Acrylic Sheet (60X60X120) inscribed with a protractor and placed between their legs. To prevent limited motion at a knee joint from confounding the results of this test, the investigator ensures that the subjects matched their limbs near the midrange of knee joint motion. Any difference in aligning the lower limbs (indicated by disparities in matching the big toes on either side of Acrylic sheet) was measured in degrees for both extremities.

Data Analysis

Mean pattern of BBS in relation to Vas score



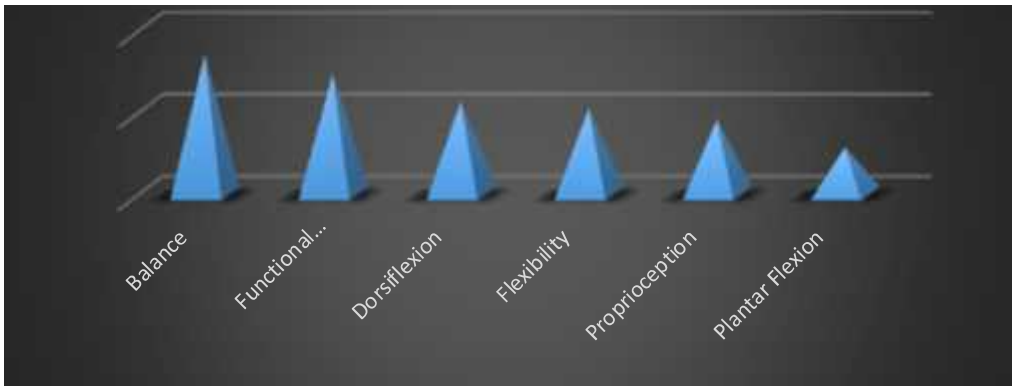
Mean pattern of S&RT in relation to Vas score



Study parameters	VAS score					P value
	0-3	3-4	4-5	5-6	6-7	
BBS	46.14 ±2.91	47.19 ±2.95	40.93 ±4.09	36.84 ±3.76	28.69 ±5.96	<0.001**
APF-Rt	29.00 ±2.23	29.75 ±2.52	23.89 ±3.15	22.19 ±2.61	19.38 ±2.16	<0.001**
APF-Lt	29.14 ±3.39	28.13 ±3.24	23.69 ±3.73	20.47 ±2.49	18.38 ±2.33	<0.001**
ADF-Rt	22.86 ±3.18	22.25 ±4.19	20.38 ±4.14	17.56 ±2.42	13.87 ±3.46	<0.001**
ADF-Lt	24.00 ±3.21	22.00 ±4.38	20.48 ±4.55	17.09 ±2.92	13.56 ±3.99	<0.001**
S&RT	17.30 ±3.41	18.72 ±2.22	12.68 ±3.25	10.25 ±1.46	9.83 ±4.84	<0.001**
TU&GT	12.29 ±0.49	12.69 ±1.07	15.86 ±3.97	19.29 ±3.56	22.32 ±2.86	<0.001**
Proprioception	7.71 ±0.49	5.75 ±1.00	4.66 ±1.26	4.47 ±1.27	3.94 ±0.77	<0.001**

Association of Study parameters in relation to Vas score. Results are presented in Mean ± SD

Relationship between Fear of fall and its risk factors



Discussion

In the current study, the ankle dorsiflexion had a large negative correlation (0.5-0.7) with fear of falling and that also been shown decreased ankle range of motion in both sex was found because of age related changes. The results suggest that, although all motions are important, compensation may occur when one motion in a plane is limited, particularly during gait. The lack of flexibility is associated with problems in executing and sustaining motor activities in daily life and is related to an increased risk of falling in older adults. According to current study the component of flexibility in male had a large negative correlation (0.5-0.7) and female had a very large negative correlation (0.7-0.9) with the fear of falling. Balance is one of the components required for execution of postural control. Balance capacity decreases with age, with results in increased risk of fall and fractures in elderly people. The results from this study shows that Berg Balance scores had a very large negative correlation with fear of falling. That is increase in the fear of fall scores with decrease in the Berg Balance Scale. In the current study, it has been found that fear of fall has a very large positive correlation with test (TUG). Proprioception is an important component of balance. Previous studies stated that proprioception does not correlate with quality of life. Whereas the current study revels proprioception had only moderate negative correlation with fear of fall.

Conclusion

The current study has shown the decline in balance, ankle range of motion, functional mobility and proprioception across the age decades. Thus, this study provides a tool for fall risk factor identification and provide valuable information for physician, therapists and other health care professional in both research and practice. There by the implication of this study is that Geriatric rehabilitation program should focus on the following risk factors of fall like balance, ankle range of motion, flexibility, functional mobility, and proprioception with greater importance on ankle range of motion and balance within older adults improve the quality of life and decrease the risk of falling in elderly.

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