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Prevalence of risk of fall in elderly due to Impaired balance

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ABSTRACT

Background: Fall is an unaccepted loss of balance which leads to failure in Postural stability. One of the most common problems faced by elderly is 'fall'. There are various reasons for fall. One among them is balance impairment. Fall Severely affects the day to day activities of elderly and cause health issues, of Which about 10% may be life threatening.

Objectives: To study the prevalence of risk of fall in elderly due to impaired Balance.

Methodology: Study design was survey method. 30 subjects were selected From Tabitha old age home of which 15 were males and 15 were females. Assessing tool was Berg Balance Scale. Implemented the scale in each subject And scored and assessed their overall balance, thereby risk of fall.

Result: Out of 30 candidates 18 had no risk of fall while 12 out of them were Prone to risk of fall. The prevalence of risk of fall was 40%. 9 females and 3 Males were prone to risk of fall. The prevalence of risk of fall in males and Females was 20% and 60% respectively.

Conclusion: Based on the findings of the survey, it was concluded that the Frequency of balance problem and risk of fall amongst our elderly population Are high with women being more vulnerable compared to males. In addition, the prevalence of risk of fall was found less in elderly during the study.

Keywords: fall, risk of fall, balance, Berg Balance Scale, impaired balance, postural instability

INTRODUCTION

Ageing is a natural process. In other words of Seneca; "old age is an incurable disease, but more recently, sir James Sterling Ross commented: "you do not heal old age. You protect it; you promote it; you extend it. These are in fact the basic principles of preventive medicine. Old age should be regarded as a normal, inevitable biological phenomenon. The study of the physical and psychological changes which are incident to old age is called gerontology.¹

Aging is a process through which slow, spontaneous, and progressive changes occur in the body structure over time and affect human life. In recent years, with increase in life expectancy, medical technology improvement, public health promotion, and mortality reduction, the life span of our population has increased. Thus, it is expected that the elderly population increase in the future. Currently, the number of worldwide elder population is 600 million, and it is predicted to reach 2 billion by 2050, which would be 22% of the world's population at that time.²

Aging impairs the central nervous system capability to process vestibular, visual and proprioceptive signals responsible for maintaining body balance, as well as for reducing the capacity of modifying adaptative reflexes. These degenerative processes are responsible for the occurrence of vertigo and/or dizziness (presbyvertigo) and imbalance (presbytaxia) in the geriatric population.⁵

Balance is the ability of an individual to successfully maintain the position of their body or restore the center of mass over time. In good posture it can be achieved by the minimal work of involved muscles

With a minimal postural way. The importance of properly functioning balance system is obvious from the fact that it can help human to see clearly while moving and make automatic postural adjustment according to the demand of activities.³

Balance is achieved by the complex integration and coordination of sensori-motor control systems including the sensory input (vision, proprioception, and vestibular system), integration of that sensory input and by motor output to the head, eye, trunk and limb muscles. The later muscles have been reported to play a vital role in maintenance of postural activities in human beings. It has been reported that balance is multifactorial and may be affected by a variety of factors. Apart from medical and psychological factors, aging process plays a significant role in maintaining balance of the body. It is obvious from the previous trials that aging process affects the ability to maintain a balanced posture and elderly people are at high risk of falls, when exposed to an activity demanding static or dynamic balance. It is noteworthy that globally 28- 35% falls occur in elderly population aged 65 years or above. An increase in this number has been reported with increasing age and the fall rate for population aged 75 years or older has been reported 40%.³

Balance impairments are often associated with impaired vision, poor hearing, vestibular dysfunction, polyneuropathy, diabetic neuropathy and many chronic diseases and disorders i.e. cerebral and cerebellar disorders, cerebrovascular disease, spinal cord disorders, intervertebral disc disorders, psychological factors, dementia, high blood pressure, postural hypotension, diabetes mellitus, heart disease, arrhythmias, proprioception,

Joint problems, arthritis and muscular weakness. Majority of the above mentioned conditions are associated with aging process and that is one of the reasons that elderly population is at high risk to falls and

associated injuries.³

Fall

Fall is “an unaccepted loss of balance that leads to failure of postural stability” or “it is a sudden and unexpected change in position which usually results in landing on the floor”⁴

Defining the term fall we considered Huang et al. definition which is “unintentionally coming to rest on the ground or other lower level other than as consequence of sudden onset of paralysis, epileptic seizure or over whelming external force.”

Identification of fall is very important as different type of fall has different measures when it comes to prevention. Fall can be classified as accidental, anticipated physiological fall or unanticipated physiological fall. There has been many research work done before on falls among elderly and it has been found out that many falls happens due to identifiable and modifiable risks factors.⁴

Falls are a common and complex geriatric syndrome that cause considerable mortality, morbidity, reduced functioning, and premature clinic visits and consequently nursing home admissions. Falls in the elderly are a public health and community problem. These included disability, deformity, fear of recurrent falls, curtailment of social activities, costs of medical care associated with injuries and loss of ability to work and potential income. Yet little attention is paid to the problems of falls and are less likely to be screened for the geriatric population (over 60 years). Fall prevention is an assessment category specific to the elderly. Falls are major source of death and injury in elderly population. Physiological age related changes in somatosensory, vestibular and visual systems are well documented in older adults. These changes coupled with age related changes in muscle and bones to contribute to an increased risk of falls. Falls have varying precipitating causes and risk factors, which make their diagnosis, treatment, and prevention a clinical challenge. Most falls involve multiple factors, but causes of falls are often categorized into intrinsic (personal) and extrinsic (environmental) factors.

Falls can be prevented to an extent through modification of environmental factors. The modifications to be undertaken include providing the individuals with walking aids, improving lightings in the household, avoiding slippery floors, etc. Application of therapeutic interventions can improve balance in these individuals.

Manifestations of body balance disorders have major impact in the elderly, which can lead to reduction of their social autonomy, given that they have to reduce their daily life activities, because of the predisposition to falls and fractures, bringing suffering, body immobility, fear to fall again and high costs to the healthcare system.

Need of the study

Knowing that the occurrence of imbalance and falls is frequent in the elderly, it is important to assess their vestibular function so as to detect diagnostic, prognostic, prophylactic and therapeutic implications in this population.

METHODOLOGY

To find out the prevalence of balance loss and fall in elderly people in Ernakulam district, we selected one old age home for the study. 30 candidates aged above 60 years were screened from Tabitha old age home.

To conduct the survey BERG BALANCE SCALE was used as a diagnostic tool.

Berg balance scale is a performance-based instrument that was originally developed by Berg to assess functional balance in older adults. BBS contains 14 items, each grading on a 5-point scale (0 to 4), representing different levels of difficulty. The BBS total score ranges from 0 to 56, with higher scores indicating a higher level of functional balance.²

Technique of Application

We conducted the survey to assess balance in the subjects. For this we used a valid tool - Berg Balance scale and implemented this tool in the 30 subjects. Initially we collected the demographic data

including name, age, gender, etc. After taking informed consent, berg balance scale is well explained to the subjects. We assessed each subject using the scale. Before the assessment each subject was given clear instructions about what the survey is for and its procedures. The subjects were asked to perform each component of the scale and based on the performance we scored and assessed their overall balance.

Inclusion criteria

- Both genders were selected
- Subjects between 60 and 80 years
- Subjects with previous history of fall
- Subjects without any orthopaedic conditions

Exclusion criteria

- Below 60 years and above 80 years
- Bedridden
- Uncooperative patients

Study design: randomized trial method

Source of data: Tabitha old age home

Material used: Berg balance scale

RESULT

Out of 30 candidates 18 candidates had no risk of fall while 12 out of them were prone to risk of fall. Prevalence of candidates with risk of fall was 40% and of candidates without risk of fall was 60%. 15 females and 15 males were selected for the study. 3 candidates from Male category and 9 candidates from the Female category were prone to risk of fall while 12 out of males and 6 out of females had no risk of fall. Prevalence of females with risk of fall was 60% while of males with risk of fall were 20%.

Table I NO RISK OF FALL		Table II RISK OF FALL	
SL.NO	BBSCORE	SL.NO	BBSCORE
1	45	1	38
2	49	2	44
3	47	3	41
4	46	4	38
5	51	5	42
6	48	6	23
7	45	7	41
8	46	8	27
9	45	9	43
10	51	10	38

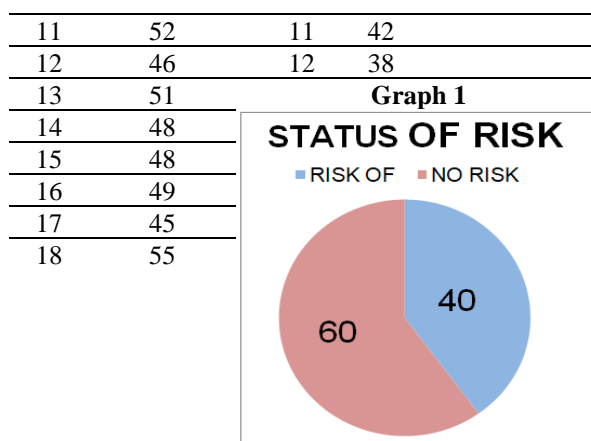


Table3: Frequency and Percentage of Status of Risk of Fall

SL. NO.	STATUS OF FALL RISK	NUMBER	%
1	NO RISK OF FALL	18	60
2	RISK OF FALL	12	40
	TOTAL	30	100

Table 4: Gender Difference in Status of Fall

SL.NO		MALES		FEMALE		TOTAL
		NO	%	NO	%	
1	TOTAL NO	15	50	15	50	100
2	WITHOUT RISK OF FALL	12	80	6	40	100
3	WITH RISK OF FALL	3	20	9	60	100

DISCUSSION

Fall and fall related injuries are major public health challenges that call for global attention. Older people aged 65 and above are admitted to hospital with falls as the common cause of injuries, therefore fall prevention is a very important consideration for the elderly, identifying fall risk factors help to evaluate the problems and to plan personal and community intervention strategy. Elderly with a history of falls are at greater risk of falling again. Multifunction’s approaches and interventions strategy is needed to effectively reduce the rising rate of falls. The majority of falls and fall related injuries that are happening are preventable using prevention measures. Prevention of falls can be accomplished through the combination of various interventions.

Aim of the study was to find the incidence of risk of fall among geriatric population due to impaired balance using BBS. The study result showed that the incidence of risk of fall in women is 60% and in male is 20%. Balance impairments may result in falls and may result in increased morbidity in these cases. Advancing

age in itself is not necessarily responsible for an increased risk of falling. Rather, the overall health status of the elderly is most strongly associated with the risk of a fall and subsequent injury.

People who have fallen in the past year are more likely than those without a fall history to fall again. Elderly people with multiple chronic illnesses are at greater risk of developing functioning limitations and disabilities. Balance impairments are often associated with impaired vision, poor hearing, vestibular dysfunction, and many chronic diseases and disorders i.e. cerebral and cerebellar disorders, spinal cord disorders, intervertebral disc disorders,, postural hypotension, proprioception, joint problems, arthritis and muscular weakness. Majority of the above mentioned conditions are associated with aging process and that is one of the reasons that elderly population is at high risk to falls and associated injuries. Alcohol use is also a predictor for fall risk.

Post fall injury is highly related with a low quality of life and greatly effects mobility and independence of affected person. Effects may last for very long time. It has been observed that most of the fractures among

elderly population are induced by accidental fall and these may be related to multiple problems leading to loss of balance. Most frequent fracture site is at the neck of femur and it is a life threatening condition in the elderly. Other sites are the backbone, pelvis, legs, ankles, upper arms, forearms, and hands. This high frequency of falls in elderly puts load on healthcare system due to visits in emergency departments and long term hospitalizations and can pose serious financial, psychological and functional burden not only to the person itself but also to health care providers.

Fall-induced injuries are increasing more rapidly than can be accounted for by the increase in the elderly population. Depending on the injury, falls can lead to hospital admission, disability and functional limitations that significantly decrease the quality of life for older people.

Strength of the Study

- Number of subjects was equal in both

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gender groups.

- There were equal exposure to all participants

Limitation of Study

- The study was done with small sample size
- **FUTURE IMPLICATION**
- The sample size of subject should be increased for more reliable outcome.
- Inclusion of subjects from diverse geographic areas can provide more reliable outcome.

CONCLUSION

Based on the findings of this survey, it is concluded that the frequency of risk of fall due to impaired balance amongst our elderly population are high with women being more vulnerable compared to males. Balance impairments amongst elderly population may be associated with various factors. However, giving them proper training and muscle strengthening exercises and physiotherapy for other related factors, risk of falls may be reduced.

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