A STUDY TO IDENTIFY FALL PREDICTION IN GERIATRIC POPULATION IN PESHAWAR

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ABSTRACT

AIM To determine risk of fall in geriatric population in the families of students of Institute of Physical Medicine & Rehabilitation, Peshawar.

METHOD It was a cross sectional survey performed in Institute of Physical Medicine and Rehabilitation Peshawar from Jan, 2014 to June, 2014. Students of IPM&R whose parents and grandparents were above the age of 65 were approached. Their parents and grandparents were analysed for the inclusion and exclusion criteria for fall prediction and those fulfilling the criteria were added in the study to identify risk of fall in them. They were analysed on Berg Balance Scale and scores were recorded according to low, moderate and high risk of fall.

RESULT Total 81 males and 69 females participated in the study. Mean of Berg Balance scale showed majority of the population had scores from 21 to 40.22% of the people had high risk, 41% had moderate risk and 36.7% had low risk of fall showing that majority of people had moderate risk of fall. Total 76.7 % individuals were between the age group 65- 74. Medicine, age, gender, visual problems, reason of fall and ear problem have direct effect on score of Berg Balance scale (BBS). Age and gender were independent variables. Of the sample included,

CONCLUSION Berg Balance score falls with increasing age showing fall risk to increase with age and majority of people had moderate risk of fall. The survey triggered awareness among individuals about balance impairments. This will encourage them to take interventions to improve balance and to reduce the fall risk in future and to improve the quality of life.

KEY WORDS Risk factors of fall, Berg Balance score in relation to age.

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INTRODUCTION

Falls are a significant public health concern for older population as human life expectancy has increased[1] causing limitation in activities. This indicates more need for health care servises.[1] Approximately 25% to 35% of people more than 65 years of age experience one or more falls each year.[2] The frequency rises to 40% for individuals over 80 years of age affecting women more than men.[3] Up to 15% of the cases result in injuries including fractures while 6% of injuries in older adults result in accidental death.[3] About 40 to 50 % of fallers admitted to hospitals experience restricted activities of daily living. This results in fear of fall, decreased self-confidence and muscular atrophy with decreased lower extremity strength.[3]

Impaired balance and motor functions are important predictors of fall in older adults resulting in decreased ADLs (activities of daily living).[3,4] Muscle weakness, fall history, medicines,[5] syncope,[5] assistive devices, arthritis and age more than 80 years are major risk factors for fall.[6]

Improper footwear, unstable living conditions and posture, neurological disabilities, visual impairments and sensorimotor deficiencies are also of considerable importance in order to predict fall.[7,8]

Berg Balance Scale was considered to be most effective predictor of fall in older adults which assesses functional balance and evaluates effectiveness of treatments and describe functions in clinical practice and research.[3]

The purpose of the study is to identify the individuals who are at risk of falling. This will help the individuals as fall prevention interventions can be targeted for those in need of balance training.[3]

METHODS

A cross sectional survey was performed Students of IPM&R whose par-

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ents and grandparents were above the age of 65 were approached. Their parents and grandparents of age 65[12] and above including both males and females having age related balance abnormalities were included in the study. Convenient sampling was done. Written consent was taken from the individuals. Individuals who were excluded were those having cancers of any kind, polyneuropathy in diabetes, glaucoma, tumours of vestibulocochlear nerves, cataract, benign paroxysmal postural vertigo, amputed extremities, and traumas of head or head surgeries."

The sample size was 150. They were analysed on Berg Balance Scale and scores were recorded according to low, moderate and high risk of fall. The data was generated with age as numerical data and gender as categorical data and was tabulated by frequency and percentage distribution. Data was analysed descriptively by mean, median, mode and maximum & minimum values and bar chart.

RESULTS

Total of 150 participants were included in the study. The statistical population chosen was the parents and grandparents of students of IPM&R above the age of 65. The percentage of males was 54% and females was 46%. Of that, 76.7% of the participants were between the age limit of 65 to 74 with more proportion of males. About 33 (22%) individuals were at high risk of fall with scores between 0-20 on Berg Balance Scale, 62 individuals (41.3%) had scores from 21 to 40 on Berg Balance Scale with moderate risk of fall and 55 individuals (36.7%) had scores from 41 to 56 having low risk of fall in the future. About 25.3% of participants experienced one fall in the past two years, 11.3% experienced two falls in the past two years, 15.3% experienced more than two falls, 8% experienced more than 5 falls and 34% had experienced no fall in the past two years. Of 66% of the individuals who had experienced fall, 28% reported fall due to hurdles in the way, 8% due to sudden blackouts, 10.7% fell due to dizziness and 34% experienced no fall. Considering place of fall, 22.7% individuals fell inside home, 16.7% fell outside home. Those who fell on wet surface were 15.3% and those who didn't fall were 32.7%. When visual problems were assessed, 45.3% had difficulty seeing, 14.7% experienced blurred vision, 9.3% had sensitivity to changing light and 9.3% had eye infections while 15.3% had no visual problem at all. As balanced is associated with vestibular system and hearing effects balance so individuals were assessed for hearing problems. About 29.3% had no hearing problem, 20.7% experienced ear pain, 18% had hearing loss and 20% had change of hearing. When considering abnormalities of lower limbs, 53.3% of the participants experienced pain in lower extremity, 14.7% experienced numbness, 16.7% experienced loss of sensation and 3.3% experienced no abnormal sensation. and 8% had no problem in the lower extremity. Of 150 individuals included in the study, 49.3% of the individuals were using antihypertensive medicines, 11.3% used diuretics, 10.7% used analgesics, 19.3 % used hypoglycemics and 8.7% participants were using no medicine at all.

TABLE 1

		Frequency	Percentage
Age:	65-74	115	76.7
	75-84	26	17.3
	85-94	9	6.0
Gender:	Males	81	54
	Females	69	46
No of falls:	01	38	25.3
	02	17	11.3
	>02	44	29.4
	None	51	34
Berg Balance Score	0-20	33	22.0
	21-40	62	41.3
	41-56	55	36.7

DISCUSSION

Falls in elderly are multifactorial and balance value alone is not enough to predict fall. Berg Balance scale was used as a dichotomous tool with ratios giving a clear view of risk of fall. For individuals who experienced multiple falls, risk of fall increases below the score of 45 and increases significantly below 40. The

TABLE 2

	BBS	Medicine	falls	ROF	VP	EP	ALL	POF
Mean	2.15	2.37	3.6	3.85	2.83	3.57	2.53	3.51
Median	2.00	2.00	3.0	4.00	2.00	3.00	2.00	3.00
Mode	2	1	6	6	2	5	2	6

BBS: Berg Balance Scale, ROF: Reason of fall, VP: Visual problem, EP Ear problem, ALL: Abnormal sensation in lower extremity, POF: place of fall.

proportion of fall rose with age. 30% of individuals above age of 65 and 50% of people above the age of 80 fall every year and the risk of falls rises 2 to 3 times for the individuals who have fallen once within a year.

Risk of fall increases with increase in risk factors 20-30% of people who suffer from fall injuries face dependence and decreased mobility with high risk of premature death. Patients with disability of lower extremity, history of fall, fear of falling or using sedatives are at high risk of fall. This might be due to reduced physical activity. Almost 50% of individuals who experience fear of falling restrict themselves from social and physical activities.

Balance is only one risk factor and other information on fall risk should also be collected. Original study stated the score of 45 used to demonstrate relative fall risk which was misunderstood and effected many studies. There is variation in values of different studies with less than or equal to 45 for any fall, less than and equal to 38 for multiple falls, less than and equal to 49 for multiple falls and less than and equal to 47 for single fall.[8]

A study was conducted with sample size of 36 which included 75% females and 25% males. Mean age of patients was 72 years. About 17% participated in physical activities 3 times in a week. About 31% used walking aids and had 1.22 as the mean number of fall in last 6 months. Mean of past fractures was 0.64. 27 individuals had visual problems, 29 patients had rheumatoid, 19 individuals had cardiac problems, 3 participants had neurological problem and 1 had GIT disturbance. About 18 patients had osteoporosis. The mean berg balance score was 49.9.[13]

Result showed that berg balance scale had strong validity, reliability and change responsiveness.

This scale had floor and ceiling effects and cannot detect severe balance changes and mild balance impairments. Patients with severe impairment cannot sit independently or stand on one foot. Though there might be important improvement in the patient's condition, berg balance scale cannot detect it and patient will be rated low on the scale. It can also miss balance improvements necessary to cope with the society.[9]

Studies showed that patients experienced both falls and injurious falls. Female gender and rise in age were the factors increasing the risk of fall. High fall risk between ages of 65-69 in females might be due to increased level of activity and exposure to environmental risk factors. Dizziness, postural instability and disturbed balance might be the intrinsic risk factors.

Physically active individuals maintain a good balance, flexibility, muscle strength, reaction time, reflexes and co-ordination to overcome postural imbalances.[10]

Cardiac medication decreases the risk of fall by reducing dizziness and regulating blood pressure. Individuals with fall history experienced more falls. Seven risk factors were identified including age, heart medication, frequency of activities, activity limitation days and diverse activity as main predictors.[11]

The sample size was small. There were fewer individuals in each age group. The factor responsible in each individual for disturbed balance was not analysed. The study should have been longitudinal one for the identification of specific factor responsible for balance disturbance.

CONCLUSION

Most of the population accessed was in the age group 65-74 as the average life expectancy in the elderly population in Pakistan is 66.4 years according to survey performed in 2012. Of the participants included, 51% of the individuals experienced no fall at all that might be due to active life style providing muscular stability, power and strength to the individuals. About 22% of the individuals were at high risk of fall.

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NOTES ON CONTRIBUTORS

The study was part of RS Bachelors in Physical Therapy Education. SF, MBAJ supervised the dissertation, and were involved in every part of the analysis, idea's development, and write-up.

CONFLICT OF INTEREST

Authors declare no conflict of interest.

ETHICS APPROVAL

The approval/permission was obtained from Khyber Medical University Research and Ethics Board.

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