FREQUENCY OF IMPAIRED BALANCE IN PATIENTS WITH KNEE OSTEOARTHRITIS IN PESHAWAR

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ABSTRACT

AIM The aim of the study was to determine the frequency of impaired balance in knee osteoarthritic patients in Peshawar.

METHOD This study was a cross sectional survey. The sample was taken from the three teaching hospitals of Peshawar. A total of 150 patients with knee osteoarthritis were recruited in the study using convenient sampling. Patients with unstable cardiac condition, physical deformity, visual problems and amputation were not included in the study. The tools used in this study were a screening questionnaire & Berg Balance scale. Inform consent was taken from all the patients. Questionnaires were filled by the patients for screening. Balance of the patients was measured using Berg Balance Scale. The scale consists of 14 items. Each item was scored according to the performance of the patient.

RESULTS Results showed that sample consists of 56% of females and 43% of males. Out of total, 49 patients were aged between 45-51 years, 66 patients were aged between 52-58 years and 35 patients were aged between 59-65 years. Among 150 patients, 22 have experienced more than 2 falls in the last one year. The prevalence of impaired balance was 48% in this population. Balance impairment was more prevalent in patients aged 52-58 years. Females with knee osteoarthritis have more compromised balance then males.

CONCLUSION The study concluded that knee osteoarthritis has an impact on balance. Impaired balance was more prevalent in patients aged more than 52 years.

KEY WORDS Knee pain, Knee osteoarthritis, Impaired balance.

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INTRODUCTION

Fall is a major public health issue in elderly population. 30-40% of elderly people fall every year[1] and 40-60% of fall result in injuries.[2] The risk of fall increases with age and is more common in females than males.[3] The major risk factors of fall are visual impairment, absence of Achilles and quadriceps reflex, lower extremity weakness, gait disturbances,[4] medications, short step length,[2] impaired balance, cognitive impairment,[5] stroke, Parkinson's disease, alcohol[6] and osteoarthritis.[7]

In developed countries, osteoarthritis is one of the major public health problems.[8] Knee osteoarthritis(OA) is the most prevalent musculoskeletal disorder that affects 30-40% of population above the age of 65 years.[9] According to the National Health and Nutrition Examination survey 10-20% of people 65-74 years of age presented with knee OA whereas Felson et al. reported that more than 30% of people above 75 years of age presented with knee OA.[10]

Knee OA is a major cause of impairment and disability in older adults. Patients suffer from functional loss and dependency in walking, stair climbing and lower limb activities.[11] It results in knee joint pain, joint stiffness, decreased muscular strength and decreased proprioception.[12] Hassan et al. showed in their study that patients with symptomatic knee OA have reduced quadriceps strength, decreased proprioception and increased postural sway.[13] Knee and ankle weakness in osteoarthritic patients result in poor balance and greater risk of fall.[7]

Balance is dependent on sensory inputs from visual, vestibular and somatosensory systems. Langely and Mackintosh emphasized that balance is an important component in carrying out activities of daily living.[14] Impaired balance increases the risk of falls in elderly population.[9] The risk of fall increases with

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increased age.[15] Presence of knee OA accelerates the changes related to aging which lead to compromised balance.[9] Standing balance is compromised in knee OA.[16,17]

Balance disturbance in older people is measured by using different scales and tests. Cohen et al. measured static balance of elderly population using clinical test of sensory interaction and balance.[18] Messier et al.assessed balance of osteoarthritic patients using ATMI (AMTI, Watertown, MA) force platform.[7] Muir et al. used Berg Balance scale to predict fall in community dwelling elderly people.[18]

As knee replacement is not common in our population and there is no assessment for fall in elderly population, therefore, the purpose of this study is to determine the prevalence of balance disturbance in elderly population with knee osteoarthritis.

METHODS

A sample was selected using convenient sampling. One hundred and fifty patients (male and female) diagnosed with knee osteoarthritis were recruited for participation in the study from three teaching hospitals (Lady Reading Hospital, Khyber teaching Hospital and Hayatabad Medical Complex) and Rehab Care Clinic. The age limit was 45-65 years.

The tools used in this study were a screening questionnaire & Berg Balance scale. Questionnaires were filled for screening. Patients meeting inclusion criteria were included in the study. Requirements for inclusion consisted of stable cardiovascular system without any history of visual & vestibular problems, rheumatoid arthritis, polyneuropathies, physical deformity, stenosis, hip and ankle problem, neurological disorders and amputation.

Berg balance, scale was used to measure the balance of all patients. Possible scores on Berg Balance Scale range from 0 to 56. The scale consists of 14 items. Each item is scored on a five point scale (0-4) according to quality of performance or time taken to complete the task. Berg et al contend that scores below 45 indicate impaired balance with increased risk of fall.[19] Equipment used for berg balance scale was a step, stool, measuring tape, stop watch, table and chair without arm rest. The purpose of the study was discussed with all patients. Informed consent was obtained by all patients. All the fourteen items were performed by the patients and were scored according to their performance.

Age was generated as numerical variable, mean, median and mode were calculated. Gender and impairment in balance was generated as categorical variable. Relationship between age and scores obtained on Berg Balance Scale was established. Relationship between gender and Berg Balance scale scores was also found to determine prevalence of balance impairments in both genders.

RESULTS

The sample consists of 150 patients with knee osteoarthritis aged between 45-65 years. The sample comprises of 85 females (56%) and 65 males (43%). 49 patients (32.7%) were aged between 45-51 years, 66 patients (44%) were aged between 52-58 years and 35 patients (23%) were aged between 59-65 years. Among 150 patients, 55.3% reported to have unilateral right/ left knee pain as their primary complaint and 44.7% of patients reported to have bilateral knee pain. When the patients were asked about the number of falls they have experienced in last one year, 30% have reported to have 1 fall in last one year, 12.7% have experienced 2 falls and 14% have experienced more than 2 falls in last one year whereas 42.7% have not experienced any fall in last one year. The prevalence of impaired balance in osteoarthritic patient was found to be 48% (Table 1).

Impaired balance was more prevalent in patients with knee osteoarthritis aged between 52-58 years (Figure 1), while females with knee osteoarthritis have more compromised balance then males (Figure2).

DISCUSSION

The amazingly increased growth in elderly population now-a-days, demands to identify preventive measures for falls in elderly population in order to delay or prevent the disability. This study supports the statement that balance is disturbed in knee osteoarthritis. The findings were consistent with information found in literature review. The findings have important clinical implication for treatment and management of knee osteoarthritic patients.

Balance evaluation is important in patients with knee osteoarthritis. Balance impairments can be measured by using different scales and tests in clinical setting. Treatment strategies for improving balance should be given to the patients and require future investigation.

The sample of this study consisted of men and women aged between 45-65 years. On initial screening through questionnaires, 50 patients who did not meet the inclusion criteria, were excluded from the study. Total 150 patients were assessed for impaired balance using Berg Balance Scale. Using simple clinical measures, the result of

TABLE 1

	AGE			GENDER		COMPLAINT		NO OF FALLS				BERG BALANCE SCALE	
	45-51	52-58	59-65	Male	Female	Unilateral	Bilateral	01	02	>2	None	0-45	46-56
Frequency	49	66	35	65	85	83	67	45	19	22	64	72	78
Percentage	32.7	44	23.3	43.3	56.7	55.3	44.7	30	12.7	14	42.7	48	52

FIGURE 1

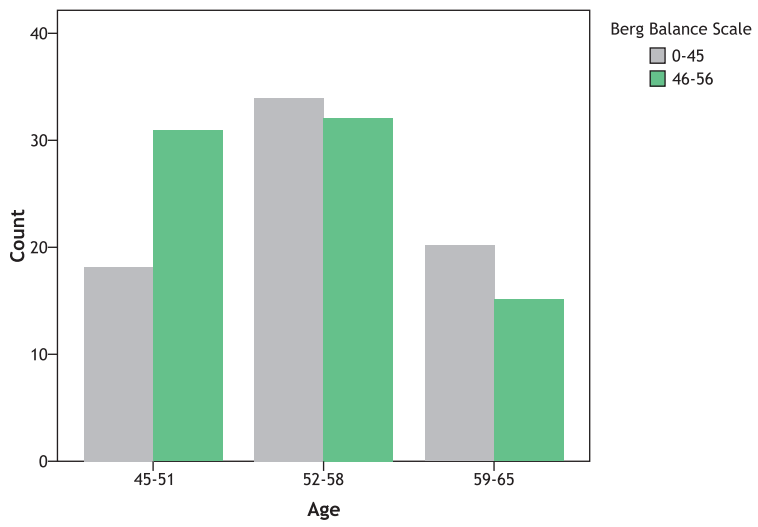
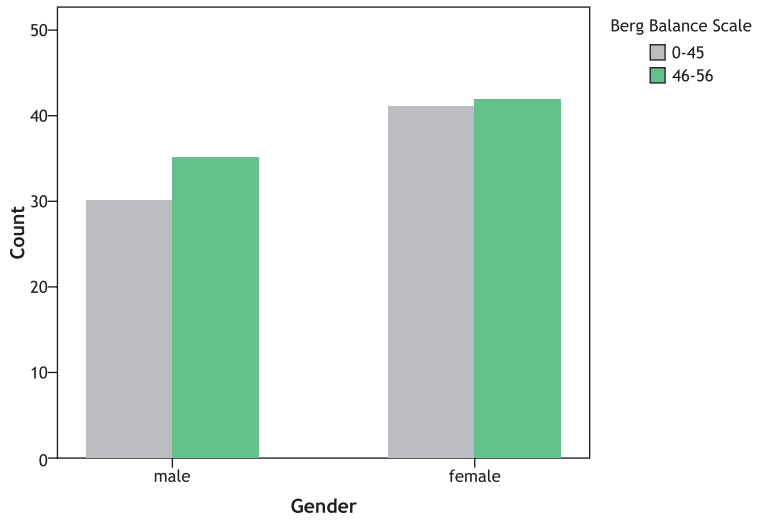


FIGURE 2



this the study demonstrated that patients with knee osteoarthritis have some balance impairment which interferes in their functional performance. Most of the patients in the study have unilateral (right/ left) knee pain.

A large number of studies have been done to find the prevalence of knee osteoarthritis. Findings of these studies revealed that prevalence is higher in women as compared to men.[20] Impaired balance is one of the consequences of knee osteoarthritis.[16] There are very few studies that have been done to find prevalence of impaired balance in patients with knee OA. In one of the study, the results showed that majority of the patients with knee osteoarthritis have achieved a mean score of 38. In an another study standing balance of knee osteoarthritic patients, compared with normal persons showed that in knee osteoarthritic patients postural sway was more than normal persons.[22]

Balance is a complex process that requires sensory inputs from visual, vestibular and proprioceptive system. There may be several causes for impaired balance in knee osteoarthritic patients. but mostly Lower limb problems, impaired proprioception and decreased muscle strength is associated with knee osteoarthritis which may contribute to decreased postural stability.[23] However, studies on relationship of these variables have not been done yet in this population.

Age was shown to be a factor involved in balance impairment in various studies where wide age range was taken.[22] The age range taken in this study was small so the age effect on balance was not expected. This is consistent with other studies in which small age range was taken.[27,28]

Pain associated with knee osteoarthritis also plays an important role in balance impairment by altering motor responses in postural stability.[24] An effective motor response requires a normal neuromuscular system and optimum muscle strength to return the center of gravity within the base of support when the balance is compromised.[21] Pain decreases loading on the affected joint.[20] Flexion contractures of knee are associated with increased postural sway in knee osteoarthritic patients.[20] which can lead to loss of balance and fall. In a study it was showed that persons scoring less than 45 on Berg Balance Scale have balance disturbances.[26] According to this study, 48% of patients scored less than 45 on Berg balance scale.

The primary limitation of this study is small sample size. The use of berg balance scale only indicates functional limitations of a patient. Further studies should be done to evaluate the proprioception of knee osteoarthritic patients as this is the major factor controlling balance.

It is suggested that further research should assess whether balance training result in improvement in knee osteoarthritic patients or not.

CONCLUSION

The study concluded that majority of the patients with knee osteoarthritis over the age of 52 years have impaired balance and are at risk of fall. Further research need to

be done to determine the effect of knee osteoarthritis on balance and the impact of knee osteoarthritis on systems controlling balance.

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NOTES ON CONTRIBUTORS

The study was part of ZB Bachelors in Physical Therapy Education. DAK, 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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