IJMRP

Original Research Article.

Assessment of Various Risk Factors of Knee Fractures: An Observational Study

Santosh Ambadasrao Ranjalkar

Associate Professor, Department of Orthopaedics,
Dr. Ulhas Patil Medical College & Hospital, Jalgaon Khurd, Jalgaon, Maharashtra, India.

ABSTRACT

Background: Current knowledge regarding the basic epidemiology of fractures is largely limited to a few fracture sites, notably those of the hip and distal forearm. There are limited recent epidemiological data pertaining to the patterns of skeletal injury around the knee joint in adult patients. Hence; the present study was undertaken for assessing the risk factors of knee fractures.

Materials & Methods: A total of 120 patients who reported to the Department of Orthopaedics, Dr. Ulhas Patil Medical College & Hospital, Jalgaon Khurd, Jalgaon, Maharashtra (India) with knee fractures were included in the present study. Detailed demographic of all the patients were obtained. Radiographic assessment of all the patients was done. Serum samples were obtained for assessing the complete hematological and biochemical profile. All the results were recorded in Microsoft excel sheet and were analyzed by SPSS software.

Results: A significant increasing incidence of knee fractures with increasing age was seen in the present study. Knee fractures were found to be present in 70 males in 50 females. Knee fractures were found significantly in higher number among most menopausal women (n = 33) in comparison to

other females (n=17). Obesity was found to be present in 78 patients with knee fractures. Out of total 120 patients, osteoporosis was found to be present in 71 patients, while it was absent in 49 patients.

Conclusion: Early identification of risk factors for knee fractures is essential for early detection and prevention.

INTRODUCTION

Current knowledge regarding the basic epidemiology of fractures is largely limited to a few fracture sites, notably those of the hip and distal forearm. The knee joint represents one of the most common sites of injuries. Pain is the leading symptom of knee injuries and may result from minor injuries such as strains or distortions or from major injuries like fractures, meniscal tears, or torn ACL.[1,2] The aim of open reduction and internal fixation (ORIF) of fractures around the knee joint is the exact anatomic reconstruction of joint surfaces in order to achieve an early and load stable bone situation. Primary endoprosthetics as the initial treatment can represent an alternative treatment option for a closely selected number of geriatric patients.[3,4] There are limited recent epidemiological data pertaining to the patterns of skeletal injury around the knee joint in adult patients. Data on fractures of the distal femur, proximal tibia and patella have been individually reported.[5,6] Hence; the present study was undertaken for assessing the risk factors of knee fractures.

MATERIALS & METHODS

The present study was commenced in the Department of Orthopaedics, Dr. Ulhas Patil Medical College & Hospital, Jalgaon Khurd, Jalgaon, Maharashtra (India). The study included evaluation of different risk factors of knee fractures. For the present study, ethical approval was obtained from institutional ethical committee and consent was obtained from all the patients after explaining in detail the entire research protocol. A total of 120 patients who reported to the department of orthopedics with knee fractures were included in the present study. Detailed demographic of all the patients were obtained. Inclusion criteria for the present study included:

- Knee fractures patients,
- Patients who gave informed consent,
- Patients within the age group of 20 to 70 years
- Patients with negative history of presence of any malignancy

A Performa was prepared for recording the risk factors for knee fractures. Radiographic assessment of all the patients was done. Serum samples were obtained for assessing the complete hematological and biochemical profile. All the results were recorded in Microsoft excel sheet and were analyzed by SPSS software. Mann-Whitney U test was used for assessment of level of significance. P- value of less than 0.05 was taken as significant.

RESULTS

In the present study, assessment of a total 120 patients with knee fractures was done in the present study. 46 patients belonged to the age group of more than 50 years. 37 patients belonged to the age group of 41 to 50 years. A significant increasing incidence of knee fractures with increasing age was seen in the present study (p- value <0.05). Knee fractures were found to be present in 70 males in 50 females. No-significant trend of prevalence of knee fractures was seen among subjects divided on the basis of gender (p- value < 0.05). In the present study, knee fractures were found significantly in higher number among most-menopausal women (n=33) in comparison to other females (n=17). Obesity was found to be present in 78 patients with knee fractures. Obesity was found to be significant risk factor for occurrence knee fractures. Out of total 120 patients, osteoporosis was found to be present in 71 patients, while it was absent in 49 patients.

Table 1: Age and gender-wise distribution of patients with knee fracture

Parameter		Number of patients	p- value
Age group (years)	Less than 30	10	0.01
	30 to 40	27	(Significant)
	41 to 50	37	
	More than 50	46	
Gender	Males	70	0.14
	Females	50	

Table 2: Risk factors for knee fractures

Parameter		Number of patients	p- value
Postmenopausal status among women	Yes	33	0.03 (Significant)
	No	17	
Obesity	Present	78	0.00 (Significant)
	Absent	42	
Osteoporosis	Present	71	0.01 (Significant)
	Absent	49	

Graph 1: Age and gender-wise distribution of patients with knee fracture
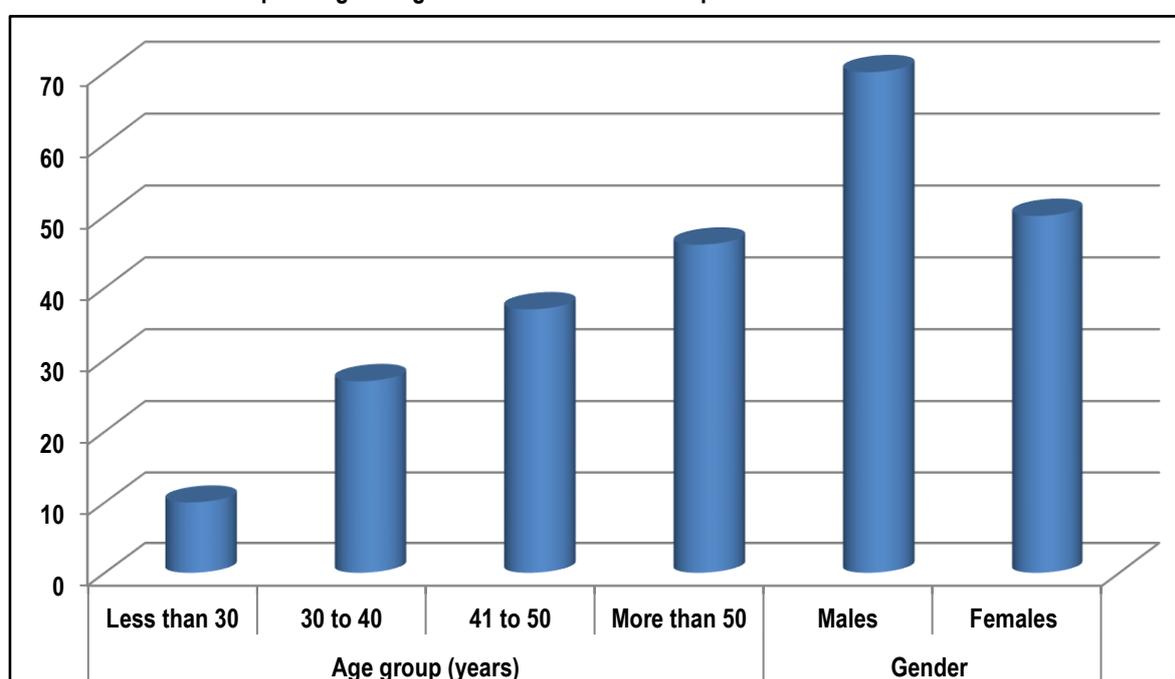
Graph 2: Risk factors for knee fractures
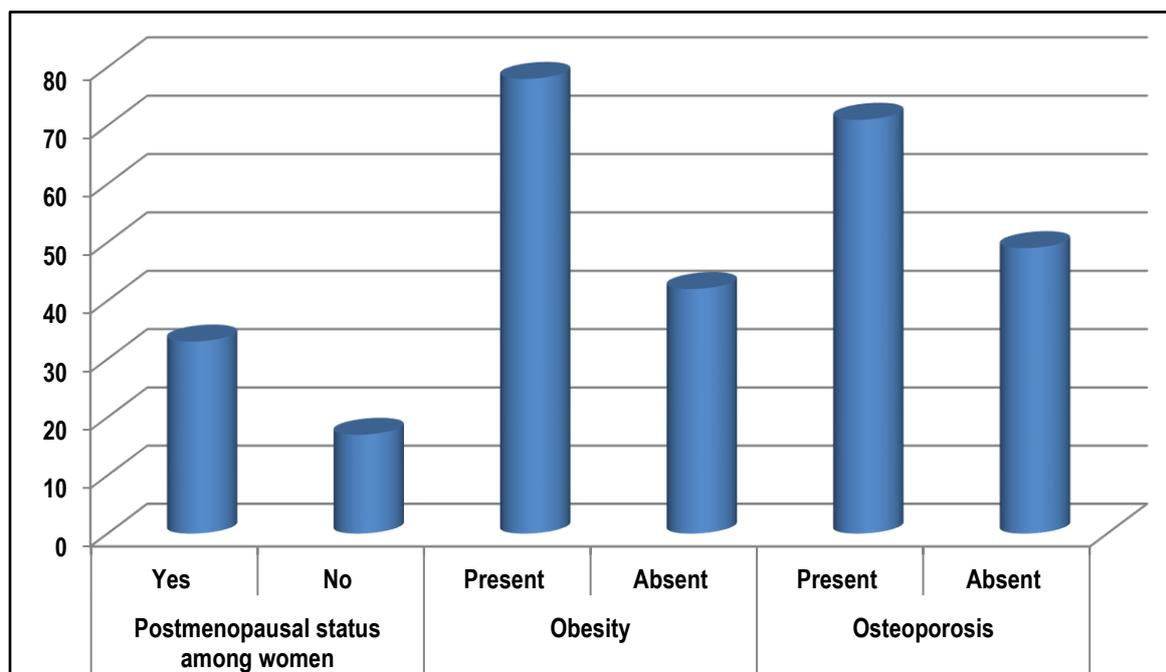
DISCUSSION

Age-related fractures are projected to increase nationally, solely on the basis of growth in the elderly population most at risk. However, changes in the actual incidence of specific fractures could aggravate or, instead, ameliorate this trend. An estimation of the overall burden of fractures in different populations have often had to rely on skeletal site-specific incidence rates reported.[7,8] Hence; the present study was undertaken for assessing the risk factors of knee fractures.

In the present study, assessment of a total 120 patients with knee fractures was done in the present study. 46 patients belonged to the age group of more than 50 years. 37 patients belonged to the age group of 41 to 50 years. A significant increasing incidence of knee fractures with increasing age was seen in the present study (p- value <0.05). Knee fractures were found to be present in 70 males in 50 females. No-significant trend of prevalence of knee fractures was seen among subjects divided on the basis of gender (p- value < 0.05). Guler F et al examined the prevalence of occult knee injuries in patients with ipsilateral tibial shaft fractures and determine their impact on clinical outcome. Preoperative knee MRI examination was performed in 41 patients (42 knees) with isolated tibial shaft fractures. Of the 42 knees, 41 (97.6 %) showed at least one defined injury around the knee. Mild to marked joint effusion was observed in 35 (81 %) knees. Twenty-two knees demonstrated bone bruise; femoral condyle (n = 7), tibial plateau (n = 12), patella (n = 2) and fibular head (n = 1). No patients had osteochondral lesion. Patients were followed with a mean of 13.2 ± 3.6 (range 8-22) months. Clinical knee examination revealed Grade II (+) anterior drawer test in two patients. The mean Lysholm knee score was 99.1 ± 2.14 (range 91-100) at the final follow-up. Ipsilateral intra-articular, extra-articular or combined knee injuries may occur at the time of injury with tibial shaft fractures.[9]

In the present study, knee fractures were found significantly in higher number among most-menopausal women (n=33) in comparison to other females (n=17). Obesity was found to be present in 78 patients with knee fractures. Obesity was found to be significant risk factor for occurrence knee fractures. Out of total 120 patients, osteoporosis was found to be present in 71 patients, while it was absent in 49 patients. Kannus P et al assessed the current trends in the number and incidence of osteoporotic knee fractures. They also predicted fracture development until the year 2030 by a regression model, which took into account the predicted changes in the fracture incidences and population at risk. The number and incidence (per 100,000 persons) of osteoporotic knee fractures in Finnish women aged > or =60 years clearly rose during the study period, from 218 (number) and 55 (incidence) in 1970 to 685 and 113 in 1999. Even after age adjustment, the incidence of women's fractures showed a clear increase, from 59 in 1970 to 105 in 1999. If this trend continues, there will be about 2.5 times more osteoporotic knee fractures in Finnish women in the year 2030 than there were in 1999. In Finnish men aged > or =60 years, the annual number of fractures and its changes were clearly smaller (77 in 1970 vs. 138 in 1999), and the fracture incidence did not show consistent trend changes over time (30 in 1970 vs. 34 in 1999). They concluded that in elderly women the number of osteoporotic knee fractures shows a rise with a rate that cannot be explained merely by demographic changes and, therefore, vigorous preventive measures are needed to control this development.[10]

CONCLUSION

Under the light of above obtained data, it can be concluded that early identification of risk factors for knee fractures is essential for early detection and prevention. However; further studies are recommended.

REFERENCES
1. Holroyd C, Cooper C, Dennison E. Epidemiology of osteoporosis. Best Pract Res Clin Endocrinol Metab. 2008;22:671–685.

2. Han HS, Oh KW, Kang SB. Retrograde intramedullary nailing for periprosthetic supracondylar fractures of the femur after total knee arthroplasty. Clin Orthop Surg. 2009 Dec;1(4):201–6.

3. Chu CQ, Field M, Allard S, Abney E, Feldmann M, Maini R. Detection of cytokines at the cartilage/pannus junction in patients with rheumatoid arthritis: implications for the role of cytokines in cartilage destruction and repair. Rheumatology. 1992;31:653–661.

4. Zingmond DS, Melton LJ, 3rd, Silverman SL. Increasing hip fracture incidence in California Hispanics, 1983 to 2000. Osteoporos Int. 2004;15:603–10. [PubMed] [Google Scholar]

5. Wright NC, Saag KG, Curtis JR, Smith WK, Kilgore ML, Morrisey MA, Yun H, Zhang J, Delzell ES. Recent trends in hip fracture rates by race/ethnicity among older US adults. J Bone Miner Res. 2012;27:2325–32.

6. Melton LJ, 3rd, Kearns AE, Atkinson EJ, Bolander ME, Achenbach SJ, Huddleston JM, Therneau TM, Leibson CL. Secular trends in hip fracture incidence and recurrence. Osteoporos Int. 2009;20:687–94.

7. Rocca WA, Yawn BP, St Sauver JL, Grossardt BR, Melton LJ., 3rd History of the Rochester Epidemiology Project: half a century of medical records linkage in a US population. Mayo Clin Proc. 2012;87:1202–13.

8. Melton LJ, 3rd, Crowson CS, O'Fallon WM. Fracture incidence in Olmsted County, Minnesota: comparison of urban with rural rates and changes in urban rates over time. Osteoporos Int. 1999;9:29–37.

9. Guler F, Kose O, Erol B, Turan A, Koroglu M, Akalin S. The prevalence of knee injuries ipsilateral to tibial shaft fractures and their impact on clinical outcome. Eur J Orthop Surg Traumatol. 2015 Jan;25(1):141-8.

10. Kannus P, Niemi S, Palvanen M, Parkkari J, Pasanen M, Järvinen M, Vuori I. Continuously rising problem of osteoporotic knee fractures in elderly women: nationwide statistics in Finland in 1970-1999 and predictions until the year 2030. Bone. 2001 Nov;29(5):419-23.