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Original ARTICLE

RISK FACTORS OF KNEE FRACTURES: A CLINICAL STUDY

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ABSTRACT
Background: Knee fractures are a common encountered condition in the orthopedic OPD these days. Hence; the present study was undertaken for assessing the risk factors of knee fractures. **Materials & methods:** A total of 86 patients with knee fractures were enrolled in the present study. Complete demographic details of all the patients were obtained. A Performa was prepared for recording the risk factors for knee fractures. All the results were recorded in Microsoft excel sheet and were analyzed by SPSS software. One-way Chi-square test was used for assessment of level of significance. **Results:** Mean age of the patients of the present study was 62.5 years. 46 patients in the present study were male while the remaining 40 patients were females. Among the 40 females with knee fractures in the present study, 28 were postmenopausal. There were 55 obese patients. Osteoporosis was found to be present in 48 patients. **Conclusion:** Increasing age, postmenopausal status and presence of obesity are all significant risk factors for the occurrence of knee fractures.

Key words: Knee, Fractures, Risk

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INTRODUCTION

A femoral shaft fracture is usually a high-energy injury and, thus, is likely to be accompanied by injuries of adjacent joints. In the literature, knee injuries were associated with 5–55% of femoral shaft fractures. The diagnosis of a fracture of the patella is made on the basis of the injury mechanism, physical examination and the radiological findings. It is suspected in all patients who have sustained a direct impact to the anterior knee and are unable to actively extend their knee after flexion injury or fall.[1-3] The extensor mechanism of the knee is based on a complex network of static and dynamic stabilizers that converge towards the centrally located patella. Within this construct the patella functions as a lever arm for knee extension, effectively augmenting the quadriceps force and consequently contributing to the extensor mechanism of the knee.[4] The crucial function of the extensor mechanism of the knee is to maintain the erect position as well as to realize the unassisted gait. The principal purpose of the patella is linking and displacement.[5-7] Hence; the present study was undertaken for assessing the risk factors of knee fractures.

MATERIALS & METHODS

The present study was conducted in the department of orthopedics of the medical institute and it included assessment of various risk factors of knee fractures. Ethical approval was obtained from institutional ethical committee and written consent was obtained from all the patients after explaining in detail the entire research protocol. A total of 86 patients with knee fractures were enrolled in the present study. Complete demographic details of all the patients were obtained. Inclusion criteria for the present study included:

- Patients who reported with knee fractures,
- Patients who gave informed consent,
- Patients within the age group of 20 to 70 years

After meeting the inclusion criteria, complete clinical and medical history of all the patients were obtained. A Performa was prepared for recording the risk factors for knee fractures. All the results were recorded in Microsoft excel sheet and were analyzed by SPSS software. One-way Chi- square 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, a total of 86 patients with knee fractures were enrolled. Mean age of the patients of the present study was 62.5 years. 38 patients belonged to the age group of more than 50 years. A significantly higher prevalence of knee fractures was seen with increasing age. 46 patients in the present study were male while the remaining 40 patients were females. No-significant results were obtained while assessing the gender-wise distribution of knee fracture patients. Among the 40 females with knee fractures in the present study, 28 were postmenopausal. Significant results were obtained while assessing the distribution of females with knee fractures according to menopausal status.
In the present study, there were 55 obese patients. Significant results were obtained while assessing the distribution of patients with knee fractures according to obese status. Osteoporosis was found to be present in 48 patients while it was found to be absent in 38 patients. Significant results were obtained while assessing the distribution of patients with knee fractures according to presence of osteoporosis.

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

Parameter		Number of patients	p- value
Age group (years)	Less than 30	6	0.00 (Significant)
	30 to 40	18	
	41 to 50	24	
	More than 50	38	
Gender	Males	46	0.14
	Females	40	

Table 2: Distribution of females with knee fractures according to menopausal status

Postmenopausal status	Number of patients	p- value
Yes	28	0.00 (Significant)
No	12	
Total	40	-

Table 3: Distribution of patients with knee fractures according to obese status

Obesity	Number of patients	p- value
Present	55	0.02 (Significant)
Absent	31	

Table 4: Distribution of patients with knee fractures according to presence of osteoporosis

Osteoporosis	Number of patients	p- value
Present	48	0.04 (Significant)
Absent	38	

DISCUSSION

In recent years periprosthetic knee fractures became a growing problem due to aging of general population and to the increase in total knee arthroplasty (TKA) implants. Distal femur is involved in most cases, much less common is the involvement of tibia and patella. Advanced age and comorbidities often characterizing periprosthetic knee fracture patients add to the intrinsic technical difficulty in treating these fractures. Therefore, clinical and surgical management of these lesions can be a challenge for the orthopaedic surgeon.[8- 10] Hence; the present study was undertaken for assessing the risk factors of knee fractures.
In the present study, a total of 86 patients with knee fractures were enrolled. Mean age of the patients of the present study was 62.5 years. 38 patients belonged to the age group of more than 50 years. A significantly higher prevalence of knee fractures was seen with increasing age. 46 patients in the present study were male while the remaining 40 patients were females. No-significant results were obtained while assessing the gender-wise distribution of knee fracture patients. Among the 40 females with knee fractures in the present study, 28 were postmenopausal. Significant results were obtained while assessing the distribution of females with knee fractures according to menopausal status. Byun SE et al evaluated the incidence, type and risk factors of ipsilateral knee injuries associated with femoral shaft fractures. A total of 429 femoral shaft fractures were included. Knee injuries were found in 131 cases. Knee ligament injuries were identified in 87 cases. There were 20 posterior cruciate ligament injuries, 11 anterior cruciate ligament (ACL) injuries, 16 medial collateral ligament (MCL) injuries, 8 lateral collateral ligament (LCL) injuries, and 32 multi-ligament injuries. In 24 cases, ligament injuries were not detected before internal fixation of femoral shaft fractures. Male sex, type C fracture of AO/OTA classification, and motor vehicle accidents were identified as risk factors for associated ipsilateral knee injuries in femoral shaft fractures. Knee injuries were identified in approximately 30% of femoral shaft fractures. About 30% of ligament injuries were not detected before internal fixation of femoral shaft fractures.[11]
In the present study, there were 55 obese patients. Significant results were obtained while assessing the distribution of patients with knee fractures according to obese status. Osteoporosis was found to be present in 48 patients while it was found to be absent in 38 patients. Significant results were obtained while assessing the distribution of patients with knee fractures according to presence of osteoporosis. Samuel AM et al identified risk factors for concurrent collateral ligament injuries with proximal tibia fractures and their association with inpatient outcomes. A total of 32,441 patients with proximal tibia fractures were identified in the 2011-2012 National Trauma Data Bank. A total of 1445 (4.5%)

had collateral ligament injuries, 794 (2.4%) had injuries to both collateral ligaments, 456 (1.4%) had a medial collateral ligament injury only, and 195 (0.6%) had a lateral collateral ligament injury only. On multivariate analysis, risk factors found to be associated with collateral ligament injuries included distal femur fracture (odds ratio, 2.1), pedestrian struck by motor vehicle (odds ratio, 2.0), obesity (odds ratio, 1.6), young age (odds ratio, 1.9 for 18 to 29 years vs 40 to 49 years), motorcycle accident (odds ratio, 1.5), and Injury Severity Score of 20 or higher (odds ratio, 1.4). In addition, patients with simultaneous injuries to both collateral ligaments had higher odds of inpatient adverse events (odds ratio, 1.51) and longer hospital stay (mean, 2.27 days longer).[12] Canton G et al critically reviewed the recent literature about epidemiology, risk factors, diagnosis, management and outcome of periprosthetic knee fractures. A systematic search of Embase, Medline and Pubmed was performed by two reviewers who selected the eligible papers favoring studies published in the last ten years. Epidemiology, risk factors, diagnostic features, clinical management and outcome of different techniques were all reviewed. 52 studies including reviews, meta-analysis, clinical and biomechanical studies were selected. Correct clinical management requires adequate diagnosis and evaluation of risk factors.[10]

CONCLUSION

From the above results, the authors concluded that increasing age, postmenopausal status and presence of obesity are all significant risk factors for the occurrence of knee fractures. Correct clinical management requires adequate diagnosis and evaluation of risk factors.

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