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Original research article

The study of epidemiological profiles of type II, type III peritrochanteric fractures of femur in elderly osteoporotic patients

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Abstract

Background: With the fact that most elderly population have a lot of co-morbid conditions, are fragile and are at a higher risk for anaesthesia and surgery related complications, this study was conducted considering a modality that aids to understand the epidemiological aspect of such cases.

Materials and Methods: Study was initiated after obtaining approval from the Institutional Scientific Committee and the Institutional Ethics Committee of JSS medical college, Mysuru. The duration of the study was 18 months from November 2019 to May 2021 involving 30 patients? This is a prospective longitudinal study which was carried, on peritrochanteric fractures of femur patients aged above 65 years of age after obtaining inform consent from the patients admitted in JSS Hospital.

Results: Thirty patients were enrolled for the study, majority of the study patients in type II per-trochanteric fractures belonged to the age group equal to seventy or less.

Conclusion: Among the 30 study patients, 17 i.e., 56.7% had pre-existing history of comorbidities and the rest 13 i.e., 43.3% did not have any pre-existing history of comorbidities. So people with comorbidities are at higher risk.

Keywords: Peritrochanteric fractures, femur, elderly, osteoporotic, patients

Introduction

In the aged population, femoral neck fractures are the most prevalent type of injury, and they are linked to a significant postoperative morbidity and death rate [1]. The femoral neck fracture is most frequently brought on by a traumatic event. Your chance of suffering a fracture in the femoral neck rises if you are above the age of 50 or if you have a medical condition that causes your bones to become more fragile, such as osteoporosis. Having bone cancer is another condition that increases your risk. In older persons, femoral neck fractures are most frequently brought on by the impact of a fall. High-energy trauma, such as being involved in a car accident or falling from a significant height, is the most common cause of these fractures in persons under the age of 40. Fractures of the femoral neck in youngsters are quite uncommon. In addition to being brought on by high-energy trauma, they are also capable of being brought on by disorders that result in low bone mineral density, such as osteopenia or osteoporosis, as well as by other conditions, such as cerebral palsy or muscular dystrophy [2].

A trochanteric fracture affects the portion of the proximal femur that is between the shaft and the cervical area. A fracture that runs from a region that is less than five centimetres distal to the lesser trochanter and into the subtrochanteric space. One of the most prevalent types of fractures to occur in senior persons is called a peritrochanteric femoral fracture. This sort of trochanteric fracture involves the femur. Extracapsular fractures are a form of fracture that can include both the greater trochanter and the smaller trochanter [3]. Fractures like this can be brought on by low-energy trauma, and the best therapy for them is still up for debate [4]. Fractures of the inter-trochanteric femur that are comminuted and unstable are among the most prevalent types of fractures that occur in elderly osteoporotic individuals. Fractures of the neck of the femur, both extracapsular and intracapsular, are one of the leading contributors to death among the aged population. In the first post-operative year, the death rates following the formation of these fractures might reach as high as 20 percent in some cases. These fractures are often the result of relatively little trauma, such as sliding and falling while walking, falling in the restroom or on the floor,

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etc. Steady and secure Open reduction and internal fixation using a Dynamic hip screw, Cephalomedullary nail, or Jewett blade plate, among other medical devices, have proven to be effective treatments for inter-trochanteric fractures [5]. The objective of treatment of femoral neck fractures in the mobile elderly population is early restoration of premorbid walking ability and quality of life [6, 7]. Internal fixation by dynamic hip screw or proximal femoral nail are often unsuccessful as unacceptably high rates of failure (avascular necrosis, nonunion, and repeat surgical procedures) are known to occur [8]. In the young the emphasis is on bone stock preservation, but in the elderly return to premorbid status with early mobilization is paramount [7]. Hemi- or total hip arthroplasty is an accepted treatment of fracture neck of femur in the elderly [6].
This study puts in an effort to find the epidemiological aspects of such cases.

Aims and Objectives
To understand the Epidemiological aspect of Type II, Type III peritrochanteric fractures of femur in elderly osteoporotic patients.

Materials and Methods
Study Place
The study was conducted at Department of Orthopaedics, JSS Academy of higher Education and Research, Mysuru, Karnataka.

Study Period
18 Months (Nov 2019 to May 2021)

Study Design
Prospective longitudinal study

Sample Size
A total of 30 cases of peri-trochanteric fractures were considered for the study

Sampling
Convenient sampling
After obtaining clearance and approval from the Institutional ethics committee and written informed consent (Annexure-1), 30 patients with AO Type II or Type III peritrochanteric fractures of femur who fulfilled the inclusion and exclusion criteria were enrolled in the study and the outcomes were assessed.
After obtaining the written informed consent, a semi-structured questionnaire either in printed formats or through Google forms consisting of baseline data which included the socio-demographic data, details on medical history, findings of clinical examinations and relevant investigations was used to collect the data.
Detailed relevant history of the fracture, the event leading to the injury, side of injury, comorbidities were collected.
Clinical examination of the fracture site and the involved joint were carried out and modified Harris Hip score of the affected limb was assessed. Further they were categorized into Type II or III peritrochanteric fractures.
All the patients were subjected to relevant investigations that included the following:
X-ray AP and Lateral views: Radiographs were obtained with standardized protocol both in the preoperative and postoperative period with limb in 15 degree internal rotation, pelvis squared without tilt and the x-ray tube at a distance of 100cm from the plate. To assess version of acetabulum, a true lateral view of the operated hip was also taken. The radiographs obtained were assessed for fracture type (Mullers AO classification), osteoporotic changes, bone quality and canal width of femur and also osteoarthritic changes in the hip joint.

Table 1: Age-wise distribution of the study subjects (n=30)

Age in years	Type II n (%)	Type III n (%)
≤70	10 (52.6)	04 (36.4)
71-80	06 (31.6)	04 (36.4)
≥ 80	03 (15.8)	03 (27.3)
Total	19 (100.0)	11 (100.0)

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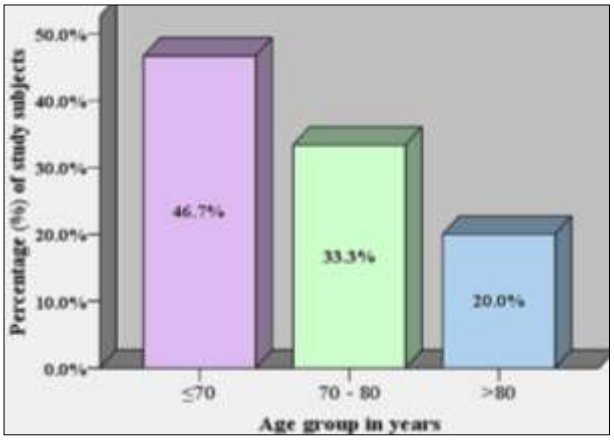
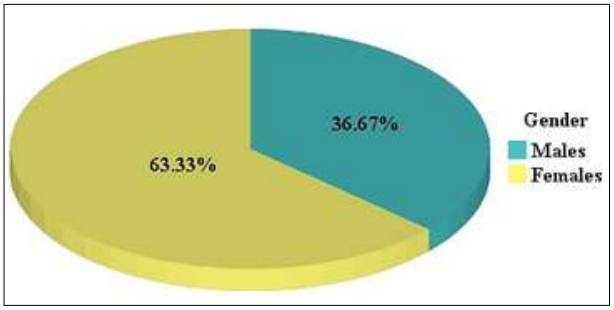


Graph 1: Age group-wise distribution of study subjects (n=30)

Table 2: Gender-wise distribution of the study subjects (n=30)

Gender	Type II n (%)	Type III n (%)
Males	07 (36.8)	04 (36.4)
Females	12 (63.2)	07 (63.6)
Total	19 (100.0)	11 (100.0)

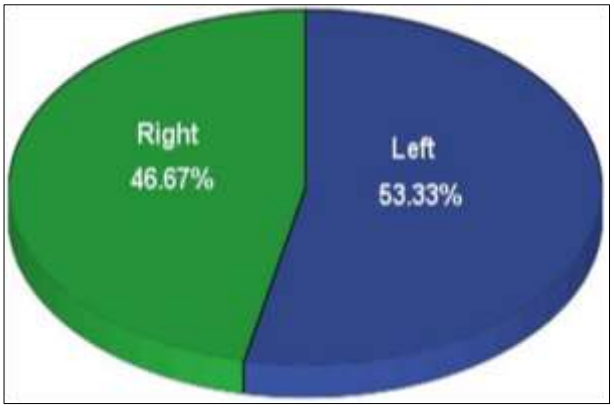


Graph 2: Gender-wise distribution of study subjects (n=30)

In the present study, out of 30 study subjects, 19 i.e. 63.3% were females and they formed the majority. The mean age of males was 73.45±8.39 years and of females 73.37 ± 8.45 years.

Table 3: Distribution of study subjects according to side affected (n=30)

Side of injury	Type II n (%)	Type III n (%)
Left	12 (63.2)	04 (36.4)
Right	07 (36.8)	07 (63.6)
Total	19 (100.0)	11 (100.0)



Graph 3: Distribution of the study subjects according to the side of femur affected (n=30)

Table 4: Distribution of study subjects according to the mode of injury (n=30)

Mode of Injury	Type II n (%)	Type III n (%)
Trauma	16 (84.2)	08 (72.7)

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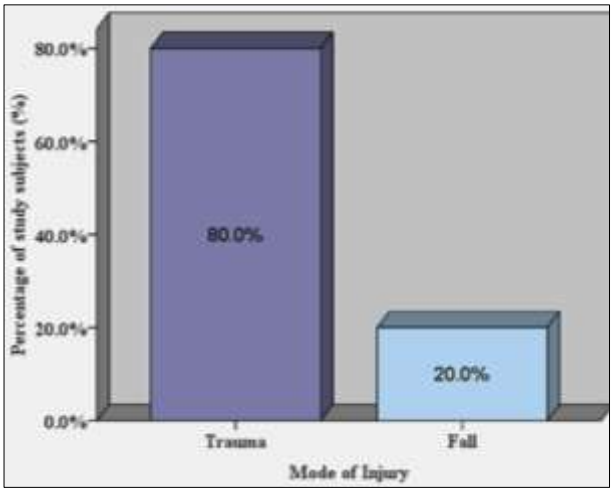
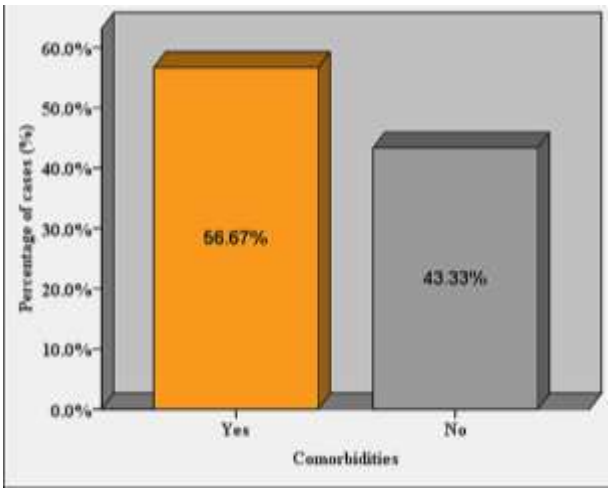
Fall	03 (15.8)	03 (27.3)
Total	19 (100.0)	11 (100.0)



Graph 4: Distribution of the study subjects according to the mode of injury (n=30)

Table 5: Distribution of study subjects based on comorbidities (n=30)

Comorbidities	Type II n (%)	Type III n (%)
Yes	13 (68.4)	4 (36.4)
No	6 (31.6)	7 (63.6)
Total	19 (100.0)	11 (100.0)



Graph 5: Distribution of the study subjects according to the comorbidities (n=30)

Table 6: Comorbidities of the study subjects (n=30)

Comorbidities (n=30)	Frequency (n)	Percentage (%)
Hypertension	14	46.7
Diabetes Mellitus	11	36.7
Old CVA	02	6.7
Obesity	01	3.3
Hypothyroidism	01	3.3
Parkinson's	01	3.3
No comorbidities	13	43.3
Total	30	100.0

Note: n>30 because of multiple subjects with coexisting comorbidities

Discussion

In our study we operated 30 cases of type II and type III peritrochanteric fractures of femur by cemented bipolar hemiarthroplasty. Most of the patients were (46.7%) of age group below 70 years. Females were predominant in both type II (63.2%) and Type III (63.6%) peritrochanteric fractures. The average age of the patients in our study was 73.40 years with a range of 55 to 90 years, thus suggesting peritrochanteric

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fractures are more common in elderly patients, owing to osteoporosis and poor bone quality. Left side (53.33%) was more commonly injured compared to the right side (46.67%) of femur bone. Trauma was the most common mode of injury experienced by the patients in both the groups of type II and Type III fracture groups with overall percentage of 80%. This data suggest that minimal trivial injury caused most of the peritrochanteric fractures in our study age group. Again pointing towards poor bone quality owing to osteoporosis. The results were consistent with the study results conducted by Gadre N *et al*. [9]. In Gadre N, *et al*. study, they operated 50 cases of comminuted intertrochanteric fractures by cemented bipolar hemiarthroplasty [9]. In all cases standard non, modular fixed bipolar prosthesis was used. The study group was rural based and not very affording. Most of the patients (64%) were of age group 70-80 yrs and 62% being females among them. 65 yrs was lowest aged patient and 89 yrs was oldest. The average age was 73.98 yrs thus suggesting that comminuted IT fractures are more common in elderly patients? Domestic fall was the most command mode of injury, suggesting trivial trauma as a major cause of comminuted IT fractures (88%) [2, 8].

Majority of the patients in our study (56.7%) had pre-existing history of comorbidities and major chunk of them were in Type II fracture patients. This suggest that old age-related medical ailments are a major problem to be considered while making choice for treatment. Hypertension had the most frequent association (46.7%). Diabetes mellitus were present in 11 (36.7%) patients followed by 2 cases of old CVA, 1 case of obesity, 1 case of hypothyroidism and 1 case of Parkinson's disease. In Gadre N, *et al*. study, many of the patients had associated medical ailments, among them hypertension had the most frequent association (20%) though many had transient raised blood pressure due to anxiety. Majority patients had their hypertension controlled by antihypertensive regime. Diabetes mellitus was present in two patients, but blood sugar levels were within normal limits after anti-diabetic treatment. These results are similar to our study results.

Conclusion

The age group above 70 years or equal to 70 years are predominantly presented with peritrochanteric fractures of femur.It is more found more common in females than in males. Left side of the femur was commonly injured and trauma was the most common mode of injury among the study patients and hypertension was most predominantly reported.

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