

## EVALUATION OF CLINICAL PROFILE OF CASES OF INTERTROCHANTERIC FRACTURES OF HIP AT TERTIARY CARE HOSPITAL

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### ABSTRACT

**Background:** Femoral neck and fractures of the intertrochanteric fractures account for >90% of hip fractures and occur in almost equal proportions. The trochanteric region has a greater proportion of trabecular bone compared with the FN region (50% versus 25%). The IT fractures, however, occur between the greater and lesser trochanters, are extracapsular fractures. **Material & Methods:** The present cross-sectional prospective study enrolled 100 patients who had all intertrochanteric fractures treated with intramedullary hip screw; intertrochanteric fracture with subtrochanteric extension; pathological fractures; open/ compound fractures. **Results:** In present study, trivial trauma was the most common cause of fracture among 60–70 years of age group whereas RTA was the most common cause for fractures among 30–40 years of age group. In the cases treated by IMHS there were 71% due to trivial trauma while there were 29% due to Road traffic accident (RTA). Majority of fractures (58%) were right sided. Type II fractures were seen in 54% of the cases, type III in 18%, type I in 17% cases and type IV in 11% cases. **Conclusion:** Most common mode of injury in young patients is the road traffic accident while most common mode of injury in older patients is the simple fall (domestic fall).

**Key words:** Hip Joint, Intertrochanteric fractures, Simple fall

### INTRODUCTION

Numerous studies have evaluated hip fracture as if it were a homogenous condition, (1, 2) when indeed it includes two distinct anatomical types: fractures of the femoral neck (FN) and fractures of the intertrochanteric (IT) region. FN and IT fractures account for >90% of hip fractures and occur in almost equal proportions. (3, 4) Given the fact that the bone composition differs at each site, it is possible that the etiology of the fracture may also differ. The trochanteric region has a greater proportion of trabecular bone compared with the FN region (50% versus 25%). (5, 6) The IT fractures, however, occur

between the greater and lesser trochanters, are extracapsular fractures, and do not typically present with the healing complications characteristic of FN fractures. (6)

The upper end of the femur comprises a head, a neck, a greater and a lesser trochanter. (1) The head of the femur is rather more than half a 'sphere' and is directed upwards, medially and slightly anteriorly. The neck is about 5 cm long, connects the shaft, it is a stout bar of bone, roughly pyramidal in shape and flattened anteriorly. The long axis of the neck makes an angle of about 120-130 degrees with the long axis

of the shaft and is termed the neck shaft angle. This arrangement allows greater mobility at the hip joint and enables the lower limb to swing clear of the pelvis.(2) The angle of ante-version is formed between the transverse axis of femoral neck to the trans condylar axis of femur in a coronal plane. It is about 15-25°.

The hip joint is ball and socket joint. In weight bearing the pressure forces are transmitted to the head and neck of the femur at an angle of 165 degrees to 170 degrees regardless of position of pelvis. The plane of the force coincides with strongly developed trabeculae that lie in the medial portion of the femoral neck and extend upwards through the supero-medial aspect of the femoral head. These trabeculae are in line with similar pressure trabeculae that start at acetabulum and run upwards and medial to sacro-iliac joint. The reacting forces normally run perpendicular to cartilaginous epiphyseal plate.<sup>3</sup> Thus the objective of the study was to know Clinical profile of patients with Intertrochanteric Fractures of Hip attending tertiary care hospital.

## MATERIALS & METHODS

The present cross-sectional prospective study was conducted at department of orthopaedics of our tertiary care hospital. The study duration was of one year from June 2017 to May 2018. A sample size of 100 was calculated at 95% confidence interval at 10% acceptable margin of error by epi info software version 7.2. Patients who were above 18 years of age; sex: both the gender; all intertrochanteric fractures treated with intramedullary hip screw; intertrochanteric fracture with sub trochanteric extension; pathological fractures; open/ compound fractures. were enrolled for the study. Clearance from Institutional Ethics Committee was taken before start of study. Written informed consent was taken from each study participant. Young patients (age <18 years), were excluded from the study.

After the patient with intertrochanteric fracture was admitted to our hospital, all the necessary clinical details were recorded in the proforma prepared for this study. After the completion of the hospital treatment patients were discharged and called for follow-up to outpatient department at regular intervals (6 weeks, 12

weeks, 6 months, 12 months) for clinical and radiological evaluation. The patients were followed up till fracture union & yearly once from then-on. Data analysis was carried out using SPSS v22. All tests were done at alpha (level significance) of 5%; means a significant association present if p value was less than 0.05.

## RESULTS

In present study, out of 100 patients, most common age group involved in this study was 60–70 years. The average age of the patients is 64.82 years as the young individuals less than 50 years are 24 involved in the road traffic accidents. Among our study subjects, males were more affected compared to females. Most of the females were in the age group of 50-60 years. The ratio of males to female in the present study was 1.44:1. (Table 1)

**Table 1: Distribution of study participants according to age and gender**

parameters		No of patients (%)
Age in years	30-40	8
	40-50	16
	50-60	20
	60-70	29
	>70	27
Gender	Male	59
	Female	41

In present study, trivial trauma was the most common cause of fracture among 60–70 years of age group whereas RTA was the most common cause for fractures among 30–40 years of age group. In the cases treated by IMHS there were 71% due to trivial trauma while there were 29% due to Road traffic accident (RTA). Majority of fractures (58%) were right sided. Type II fractures were seen in 54% of the cases, type III in 18%, type I in 17% cases and type IV in 11% cases. (Table 2)

**Table 2: Distribution study participants according to various parameters.**

parameters		No of patients (%)
Mode of injury	Trivial	71
	Road traffic accidents	29
Side involved	Right	58
	Left	42
Type of fracture	Type I	17
	Type II	54
	Type III	18
	Type IV	11

## DISCUSSION

The most common age group involved in this study was 60–70 years. This implies the fact that patients of these age groups are prone for low energy trauma like domestic fall.<sup>6</sup> In a study of Gallagher et al, an eight-fold increase in trochanteric fractures in men over 80 years and women over 50 years of age.<sup>(7)</sup> The hip joint is ball and socket joint. In weight bearing the pressure forces are transmitted to the head and neck of the femur at an angle of 165 degrees to 170 degrees regardless of position of pelvis. The plane of the force coincides with strongly developed trabeculae that lie in the medial portion of the femoral neck and extend upwards through the supero-medial aspect of the femoral head. These trabeculae are in line with similar pressure trabeculae that start at acetabulum and run upwards and medial to sacro-iliac joint. The reacting forces normally run perpendicular to cartilaginous epiphyseal plate.

A study by Cleveland et al showed that there are higher incidences of multiple fractures, as of the same or opposite side, which may occur at different occasions.<sup>(8)</sup> When a patient stands on both legs the static force passing through each of the hip is half of or less than one-third of total body weight. When the patient stands on one leg the pressure exerted on the femoral head is the sum of the force of abductor lever arm and the weight of the body. Each force is related to the relative length of the levers and the two forces are counter balancing. If the abductor lever arm is longer (i.e. the laterally placed insertion of the abductors) the ratio between the levers is less and less abduction force is needed to maintain balance and

thus less pressure on femoral head. Normal activities subject proximal femoral region with bending, torsional, axial forces. Because of peculiar shape of this region is loaded eccentrically. These loads are resisted by large dimension, greater peripheral substance and large cortical surface of Greater trochanter.

In out of 100 patients, most common age group involved in this study was 60–70 years. The average age of the patients is 64.82 years as the young individuals less than 50 years are 24 involved in the road traffic accidents. Among our study subjects, males were more affected compared to females. Most of the females were in the age group of 50-60 years. The ratio of males to female in the present study was 1.44:1. As the present study was conducted in a rural population, the majority of the patients in the study were males as they are engaged in activities like agriculture, driving of motor vehicles and are more likely to be involved or prone to accidents/ fall. According to Cleveland et al study, females were more affected and reasons could be that Females have slightly wider pelvis with a tendency to having coxa vara and they are usually less active and are more prone to senile osteoporosis.<sup>(8)</sup>

In present study, trivial trauma was the most common cause of fracture among 60–70 years of age group whereas RTA was the most common cause for fractures among 30–40 years of age group. In the cases treated by IMHS there were 71% due to trivial trauma while there were 29% due to Road traffic accident (RTA). Inadequate protective reflexes, to reduce energy of fall below a certain critical threshold. Inadequate local shock absorbers e.g. muscle and fat around hip. Inadequate bone strength at the hip on account of osteoporosis or osteomalacia may be the reasons. Hip fractures in young adults were observed to result most often with high energy trauma such as motor vehicular accidents or a fall from height.

Young patients with intertrochanteric or sub trochanteric fractures sustained trauma either as a result of road traffic accident, there by reflecting the requirement of high velocity trauma to cause fracture in the young. According to study done by Horn & Wang, mechanism of injury is not direct but due to failure of Stress resisting forces during sudden

bending or twisting. A direct blow on the lateral side of thigh would result in contusion, comminution on the lateral surface of the greater trochanter and cause valgus deformity.(9) In cadaveric femora, the femora classed as poorly mineralized broke more under dynamically applied loads as compared to well mineralized bone. They produced a fracture with a swinging pendulum, simulating a direct blow over the greater trochanter as per the study done by Spears and Owens. (10)

## CONCLUSION

There was a male preponderance in our patients. A male to female ratio was about 1.7:1. There were 32 males (64%) and 18 females (36%). The male predominance in our study is attributed to active lifestyle of males and majority of mode of Injury was simple fall (domestic fall) followed by road traffic accident (RTA).

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