



HUMERAL SHAFT FRACTURES IN KASHMIRI POPULATION: AN EPIDEMIOLOGICAL STUDY

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ABSTRACT We looked at 86 humeral shaft fractures that were treated at orthopaedic department, GMC Srinagar between July 2019 to September 2021. The AO morphology, location, patient age and gender, as well as the mode of injury, all served to define the fractures. The Gustilo and Anderson classification was used to classify open fractures, while the Tschern system was used to classify closed fractures. 53.4%, 36.2%, and 10.46% of the fractures were categorised as AO type A, type B, or type C. With 33.7% in the proximal third and 10.46% in the distal third, the middle part of the diaphysis saw the majority (55.8%) of the events. Majority of the fractures (94.18%) were closed and 5.81% were open injuries. There was a bimodal age distribution with a smaller peak in the sixth decade following a simple fall in women and a greater peak in the third decade following a moderate to serious injury in males.

KEYWORDS :

INTRODUCTION:

Few studies have focused on the epidemiology of humeral shaft fractures. (1,2) All of the fractures occurring in a known area to a specified demographic must be examined to provide a complete picture of their epidemiology. The planning of care may then be made easier, training priorities can be established, and orthopaedic traumatology can be better understood with the help of this information. This study was conducted in an orthopaedic trauma centre that provides inpatient and outpatient care for injuries to a population of around three million people.

MATERIAL AND METHODS:

All inpatients and outpatients with a humeral diaphyseal fracture who were 18 years of age or older between July 2019 and September 2021 were included in the study. A diaphyseal fracture was characterised as one that occurred between the region directly above the supracondylar ridge and the superior boundary of the insertion of the pectoralis major. The AO system was used to classify every fracture.(3)For closed fractures, we used the Tschern classification(4) and for open fractures, the Gustilo system.(5,6) Also, they were classified based on whether they were in the proximal, middle, or distal thirds of the diaphysis. We tallied six primary sources of injury: falls from a standing height or greater, sports injuries, pedestrian-related injuries in motor vehicle accidents, other pedestrian-related injuries, and pathological fractures.

RESULTS:

We looked at 86 patients who had unilateral humeral shaft fractures; 37 had fractures on the right side and 49 on the left. There were 32 women and 54 males, and their average age was 52.2 years (18 to 80). Table 1 provides a breakdown of the incidence of fractures suffered by decade. A bimodal distribution is present, with peaks in the third and sixth decades. 55 % of all fractures were sustained by patients below the age of 50. In the third decade for men and the seventh for women, there was the highest peak. 48 patients under the age of 50 had 69% male patients, whereas 38 patients above the age of 50 had 45% female patients. 53.4% of fractures were AO type A, or simple fractures, 36.2% were type B, or wedge fractures, and 10.46% were type C, with the more intricate patterns, according to an analysis of the fracture distribution into AO groups (Table 2). The most frequent type of fracture was the B1 type (23.25%), followed by the A1 type. The straightforward oblique A2 fractures were likewise rather typical. Approximately 55.8% of humeral diaphysis fractures occurred in

Table 1. AO type and gender breakdown of 86 humeral shaft fractures by decade

Age (yrs)	No. of patients	percentage	AO type			Women (%)
			A	B	C	
18-30	23	26.74	11	9	3	30
30-40	14	16.27	7	7	0	28
40-50	11	12.79	6	4	1	36

Age Group	No. of Fractures	Average Age (yrs)	Male	Female	Total	
50-60	19	22.1	10	6	3	42
60-70	13	15.11	8	3	2	46
>70	6	6.9	4	2	0	50

Table 2. 86 humeral fractures are divided into AO kinds according to proportion, with the average age for each category.

Type	Percentage	Average age (yrs)
A1	20.93	
A2	18.6	50.5
A3	11.62	
TOTAL	53.4	
B1	23.25	
B2	8.13	56.8
B3	4.65	
Total	36.2	
C1	5.81	
C2	3.4	49.4
C3	1.16	
TOTAL	10.46	

Table 3. The location and frequency of humeral diaphysis fractures

Fracture position	Incidence (%)
Proximal	33.7
Middle	55.8
Distal	10.46

Table 4. Tschern classification(4) distribution of 86 closed humeral fractures according to incidence

Tschern	Incidence (%)
C0	24.4
C1	52.32
C2	12.79
C3	4.65

Table 5. Distribution of Gustilo type(5,6) open fractures according to incidence

Gustilo type	Incidence (%)
I	3.48
II	0
IIIa	2.32
IIIb	0

Table 6. Numbers of patients and their mechanism of injury type

Age (yrs)	Fall			RTA		
	Simple	Fall from height	Sport	pedestrian	vehicular	Pathological
18-30	2	4	7	3	7	0
30-40	1	5	3	1	4	0
40-50	0	3	0	3	5	0
50-60	14	1	0	4	0	0

60-70	9	0	0	0	3	1
>70	3	0	0	1	0	2

the middle third, 33.7% in the proximal, and 10.46% in the distal third (Table 3). 81 closed fractures (94.18%) were present. Using the Tscherne classification, these injuries were examined (Table 4). The C2 (12.79%) and C3 (4.63%) fractures were substantially less prevalent than the C1 (52.32%) and C0 (24.4%) fractures. The most common types of open fractures were Gustilo types I (3.48%) and IIIa (2.32%). (Table 5). Table 6 provide an examination of the age distribution, incidence, and their underlying mechanisms of injury. The majority of fractures in the second and third decades were in men, with a significant number occurring in sports-related incidents and car accidents (RTA). Most fractures up to the age of 50 were caused by more severe, high-energy accidents. From the sixth decade on, falls from standing height were the cause of 50% of fractures in women. As people aged, pathological fractures developed more frequently.

DISCUSSION:

The majority of these simple humerus shaft fractures are brought on by middle-aged to elderly individuals who are most likely osteoporotic. The age-specific incidence pattern fits the "post-wage-earning" fracture pattern, a "J"-shaped curve reported by Buhr and Cooke(7). Our data supports their hypothesis that these fractures, which are primarily osteoporotic in character, are caused by significant violence in young people. When utilised on older patients, the two most popular surgical techniques face challenges. Due to inadequate screw purchase and antegrade intramedullary nailing, which violates the rotator cuff and can result in significant problems in elderly individuals, plating osteoporotic bone is unreliable. (8)

The epidemiological data we have collected is different from what has already been published. In a retrospective analysis of 240 humeral shaft fractures, Mast et al.(1) showed that the injury was distributed rather evenly across the shaft and that 60% of these fractures occurred in people under the age of 30. While 17% of the fractures were caused by gunshot wounds, this implies a more violent environment and demonstrates the challenge of interpreting epidemiological data from a selected population in a level-1 trauma centre.

116 (or 20%) of the 586 humeral fractures studied by Rose et al2 involved the shaft. For the later injuries, they observed a bimodal distribution with a peak in the under-30-year and over-30-year age categories. Over 70% of the fractures in the first group were caused by severe trauma, with men accounting for little over half of the cases. This information also point to a certain demographic.

Our series' analysis reveals a bimodal fracture distribution. The divide occurs at 50 years of age, with the maxima occurring in the third and sixth decades. Most of the fractures in the group of people under 50 years old were caused by moderate to severe trauma, with majority of fractures occurring in men. However, in our series, simple falls caused over 60% of fractures in those over the age of 50, and majority of those fractures included women. Fractures caused by sport and RTA are substantially more common in injuries to long bones in the lower limb. (9)

More than 50% of humerus shaft fractures occurred in the middle segment and were AO type A. In general, more forceful injuries were accompanied by fractures of increasing severity as determined by the AO type. Nonetheless, a number of type-C fractures following straightforward falls in the old, possibly as a result of the biomechanical characteristics of old bone.(10) There was a logical relationship between rising soft-tissue injuries and Tscherne score, the AO fracture type's increasing severity and getting older. Just 6% of the fractures were open, however there was a strong link between AO type and Gustilo type as they increased.

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