

# Prevalence of Hand Fractures: A Clinical Study

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## ABSTRACT

**Introduction:** Hand fractures represent the 20% of all fractures. This study was conducted to investigate and analyze the epidemiology of hand fractures.

**Material and methods:** This study was conducted in department of orthopaedics in 2015. A total of 3022 recorded in 2015 with fractures of various bones. Out of which 786 patients sustained total of 260 fractures of hand.

**Results:** Out of 260 patients with hand fractures, 180 were seen in males and 80 were seen in females. 65 (25%) were involving carpal bone fractures. Scaphoid was involved in 42 cases, lunate and triquetrum in 3, trapezium in 10, trapezoid and capitates 2 each and hamate in 1 case. There was no significant difference among left and right hand. 65% cases were of scaphoid bone fractures. The difference was significant (0.02).

**Conclusion:** Author concluded that hand fractures were more commonly seen in males as compared to females. The prevalence of scaphoid fracture was high as compared to other carpal bones. The most common reason was road traffic accident. Hence prevention should be taken to avoid fractures involving hand bones.

**Keywords:** fracture, Hand, lunate, scaphoid

## INTRODUCTION

The hand more than any organ system, enables us to manipulate our environment. Hand injuries are one of the commonest injuries seen in the accident and emergency department. Misdiagnosis of hand injuries may result in major morbidity from loss of hand function.<sup>1</sup> These injuries are a common source of medical malpractice complaints. Hand and wrist injuries contribute a considerable workload for any individual accident and emergency department. There is little information concerning the prevalence of hand fractures and their distribution between the phalanges, metacarpals and carpal bones.<sup>2</sup>

When an accident occurs, the hand is the part of body most thrust out to lessen the consequences, resulting in a wide array of combinations of soft tissue and chondro-osseous injuries.<sup>3</sup> During any kind of injury, person tries to protect himself/herself to resist injury with hands. So impact of force of injury reaches the hands first before it affects other body parts. The trauma receive by hand also depends upon whether the person is left handed or right handed. Right handed person will use right hand and hence the trauma will be received by right hand and same in the case of left handed person.

Any injury to the underlying structure of the hand carries a potential for serious handicap. To reduce this risk, even the smallest hand injuries require proper medical evaluation. Lacerations have been estimated to account for 1/3 of hand injuries presented to the emergency room. Metacarpal and phalanges fractures accounts for 21% of all pediatric fractures. Although bones of adults and children share most of the same risk, the pattern of injury and accident are very different in adult life, which is usually due to the presence of a growth plate in

children.<sup>4</sup>

Radiography is the practicing way to diagnose these injuries but regardless of this, a large number of hand injuries are missed leading to delay of treatment, resulting in handicap as the children are incapable of giving a proper history.<sup>5</sup> Extraoral radiographs such as Hand wrist radiographs are of paramount importance as fractures involving carpal and metacarpals are well demonstrated in these radiographs.

The aim of present study is to record the prevalence of hand fractures, etiology and comparison with different studies.

## MATERIAL AND METHODS

This study was conducted in the department of orthopaedics in 2015. A total of 3022 recorded in 2015 with fractures of various bones. Out of which 786 patients sustained total of 260 fractures of hand. Detailed information was obtained from the patient records on the date of attendance, age, sex, occupation, mechanism of injury and hand dominance. Following inclusion and exclusion criteria was used.

**Inclusion criteria:** Fracture involving hands.

**Exclusion criteria:** Any other bone fractures except hand.

We evaluated various fractures involving left and right hands. Fractures involving carpal such as scaphoid, lunate, triquetrum, pisiform, trapezium, trapezoid, capitate and hamate were recorded. Metacarpals and phalangeal bone fractures such as middle, proximal and distal phalynx was also recorded. Hand wrist radiographs of involved hand was taken and evaluated carefully to examine fractures.

## STATISTICAL ANALYSIS

Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

## RESULTS

Table 1 shows that out of 260 patients with hand fractures, 180 were seen in males and 80 were seen in females. The difference was highly significant.

Table 2 shows distribution of carpal bones fractures. Out of 260 hand fractures, 65 (25%) were involving carpal bone fractures. Scaphoid was involved in 42 cases, lunate and triquetrum in 3, trapezium in 10, trapezoid and capitates 2 each and hamate in 1 case. There was no significant difference among left and right hand. 65% cases were of scaphoid bone fractures. The

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difference was significant (P-0.02).

Table 3 shows that out of 260 hand fractures, 195 (75%) were involving metacarpal and phlyngeal fractures. Total cases of thumb fractures were 48, index finger were 37, middle finger 35, ring finger 38 and little finger 37. The difference was non significant (P- 0.1).

Figure 1 shows the etiology of hand fractures. Out of 260 cases, road traffic accidents were seen in 180 cases, fall from tree in 20 cases and trauma while playing was seen in 60 cases. The difference was statistical significant (P- 0.04).

Figure 2 shows the percentage of hand fractures recorded in various studies. According to study of Butt, it was 29%, Hove 17%, Sahlin 15 %, Shaheen 17%, Van onselen 19% and De Jonge JJ<sup>14</sup> 12%. In our study, it was 33%.

Total - 260		
Male	Female	P value
180 (70%)	80 (30%)	0.01

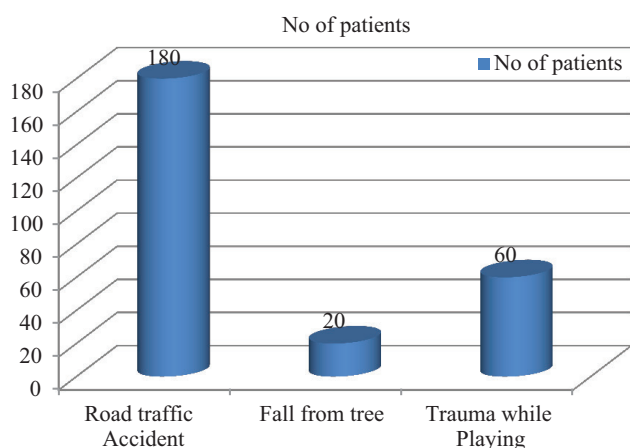
**Table-1:** Distribution of patients

Carpel bones	Left	Right	Total
Scaphoid	18	24	42
Lunate	2	1	3
Triquetrum	1	2	3
Pisiform	1	1	2
Trapezium	2	8	10
Trapezoid	1	1	2
Capitate	1	1	2
Hamate	0	1	1
Total	26 (40%)	39 (60%)	65

**Table-2:** number of carpel fractures

		Thumb	Index	Middle	Ring	Little	Total
Metacarpel	Left	9	5	4	6	8	32
	Right	10	8	5	7	7	37
Proximal Phalanx	Left	6	4	5	4	2	21
	Right	6	4	5	4	5	24
Middle Phalanx	Left	3	4	2	4	2	15
	Right	5	4	6	3	2	20
Distal Phalanx	Left	5	3	2	6	8	24
	Right	4	5	6	4	3	22
Total		48	37	35	38	37	195

**Table-3:** Distribution of metacarpel and phlyngeal fractures



**Figure-1:** Distribution of patients based on etiology

## DISCUSSION

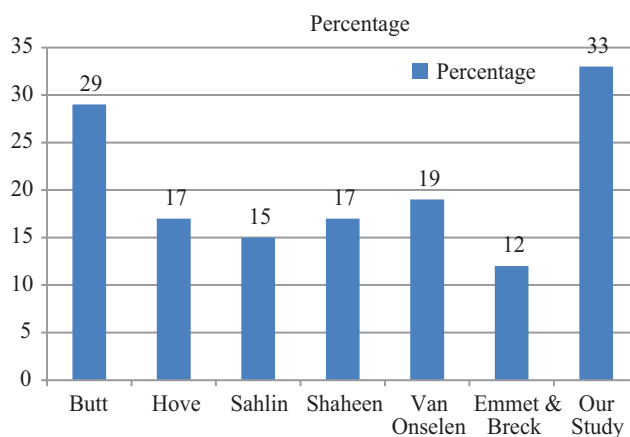
Epidemiological studies are necessary to determine the requirements of any population to improve the quality of life and health of the citizens of any country.<sup>6</sup> The epidemiology of hand fractures can provide information about how people are injured and know how the geographic area, the socioeconomic status, the traffic and social behavior can influence this type of trauma.

Hand injuries are considered to be the most frequent body injuries, the treatment of which is of long duration and great community expense.<sup>7</sup>

In our study, out of 260 patients with hand fractures, 180 were seen in males and 80 were seen in females. The prevalence was higher than previous studies.<sup>8,9</sup>

Out of 260 hand fractures, 65 (25%) were involving carpel bone fractures. Scaphoid was involved in 42 cases, lunate and triquetrum in 3, trapezium in 10, trapezoid and capitates 2 each and hamate in 1 case. There was no significant difference among left and right hand. 65% cases were of scaphoid bone fractures. The difference was significant (0.02). The prevalence of scaphoid fracture was high as compared to other carpel bones. This difference is due to population differences as young adults, when falling on the outstretched hand, are more likely to sustain a scaphoid fracture than a colles' fracture.

In our study, 195 cases (75%) were involving metacarpal and phlyngeal fractures. Total cases of thumb fractures were 48, index finger were 37, middle finger 35, ring finger 38 and little finger 37. We found that road traffic accidents were more common cause of hand fractures followed by trauma while playing and fall from tree. Our results are in agreement with the results of various studies. We compared the prevalence of hand



**Figure-2:** Prevalence of hand fractures by different authors

fractures in our study with various authors.

According to study of Hove<sup>10</sup> 17%, Sahleen<sup>11</sup> 15 %, Shaheen<sup>12</sup> 17%, Van onselen<sup>13</sup> 19% and De Jonge JJ<sup>14</sup> 12 % and Butt<sup>15</sup> it was 29%. In our study, it was 33%. The higher rate recorded in our study may be due to geographical variation.

## CONCLUSION

Author concluded that hand fractures were more commonly seen in males as compared to females. The prevalence of scaphoid fracture was high as compared to other carpal bones. The most common reason was road traffic accident.

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