

Original Article

Patients Presenting with Acute Hand and Wrist Injuries at Tertiary Care Center: A Descriptive Cross-sectional Study

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ABSTRACT

Background: Acute hand and wrist injuries are often neglected and result in poor outcomes. Newer studies have suggested that the patterns of these injuries have changed due to changes in the mechanism of injury. This study aims to find out the prevalence of acute hand and wrist injuries in patients presenting to the emergency department of a tertiary care center.

Methodology: This was a descriptive cross-sectional study conducted involving patients presented with acute hand and wrist injuries between January 1, 2023, and December 31, 2023. Patients who presented late (>1 week) and those who received treatment at other centers were excluded from the study. The following data were recorded in an electronic proforma: age, gender, mechanism of injury, hand dominance, location of injury (hand, wrist, or both), pattern of injury (blunt, cut, or crush), and associated injuries.

Results: A total of 1246 patients visited the emergency department with orthopedic issues. Out of 1246 patients, 153 (12.27%) had acute hand and wrist injuries. The mean age of the patients was 27.16 ± 14.14 years, 129 (82.69%) were male and 24 (18.60%) were female. The mechanism of injury was road traffic accidents in 54 (35.30%), occupational hazard in 46 (30.07%), falls in 29 (18.95%), and others in 24 (15.68%). The type of injury was crush in 51 (33.33%), cut in 43 (28.10%), blunt in 38 (24.83%), and avulsion in 21 (13.72%) patients. The associated injuries were present in 48 (31.37%) patients.

Conclusion: The prevalence of hand and wrist injuries was 12.27% among patients with orthopedic trauma. RTA was the most common mechanism of injury, followed by occupational hazards. Crush injuries were the most common injury pattern, followed by cut injuries. The findings were similar to those reported in studies conducted in similar settings.

Keywords: Crush Injuries, Hand Injuries, Multiple Trauma, Polytrauma, Road Traffic Accidents, Wrist Injuries

INTRODUCTION

Acute hand and wrist injuries are frequently encountered in an orthopedic emergency, which accounts for about 4-30% of all injuries.¹ These injuries are often related to occupational hazards and are common in young individuals of the productive age group.^{1,2} Most of these injuries require early management to allow early rehabilitation and to provide better functional outcomes.¹⁻³ However, there is no standard treatment algorithm for managing such injuries. Thus, these injuries are often neglected and result in poor outcomes, such as chronic pain and functional disabilities.⁴

Newer studies have suggested that there has been a change in the patterns of these injuries due to changes in the mechanism of injury, as several other mechanisms of injury, such as road traffic accidents (RTA) and sports injury, have been described.^{5,6} It is essential to identify the prevalence of acute hand and wrist injuries and their injury patterns to formulate a treatment algorithm and improve preparedness in the emergency department. There is also a lack of enough studies identifying the prevalence of such

injury in our context.^{6,7}

This study was conducted to find out the prevalence of acute hand and wrist injuries in patients presenting to a tertiary care center. In addition, it will evaluate injury mechanisms, patterns, and concomitant injuries in patients presented with acute hand and wrist injuries.

METHODS

This was a descriptive cross-sectional study conducted at B&B Hospital after getting formal approval from the institutional review committee (Ref. no: B&BIRC-23-51). Patients presenting with acute hand and wrist injuries between January 1, 2023, and December 31, 2023, were included in the study. Patients who presented late (>1 week) and those who received treatment at other centers were excluded from the study. A convenient sampling technique was used, and the sample size was calculated using the standard formula.

$$\begin{aligned} \text{Minimum required sample (N)} &= Z^2 pq/E^2 \\ &= (1.96)^2 \times 0.02 \times 0.98 / (0.05)^2 \\ &= 30.11 \end{aligned}$$

Where,

Z = 1.96, constant for a 95% confidence interval (CI)

P = 0.09, 2% prevalence of hand and wrist injury taken from previous study⁷

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Q= 0.91, 1-p
E= 0.05, 5% margin of error

The minimum required sample was 31. However, all eligible patients within the study period were included.

Following data were recorded in an electronic proforma: age, gender, mechanism of injury (RTA, occupational hazard, fall, or others), hand dominance, location of injury (hand, wrist, or both), pattern of injury (blunt, cut, crush, or avulsion), and associated injuries (multiple traumas or polytrauma). Collected data were stored and analyzed in Microsoft Excel version 2019. Continuous data were reported as mean \pm standard deviation and categorical data were reported as number (percentage).

RESULTS

A total of 1246 patients visited the emergency department following trauma. Out of 1246 patients, 153 (12.27%) had acute hand and wrist injuries. The mean age of the patients was 27.16 ± 14.14 years, 129 (82.69%) were male and 24 (18.60%) were female. The dominant hand was right in 126 (82.35%) patients and left in 27 (17.65%) patients. The injured side was right in 86 (56.21%), left in 55 (35.95%), and both in 12 (7.84%) patients and 109 (71.24%) had only hand injuries, 16 (10.45%) had only wrist injuries, and 28 (18.31%) had combined injuries. The mechanism of injury, patterns of injury, and concomitant injuries are shown in Table 1.

Table 1 Prevalence of mechanism of injury, patterns of injury, and concomitant injuries

Characteristics	Frequency
Mechanism of injury	
RTA	54 (35.30%)
Occupational Hazard	46 (30.07%)
Fall	29 (18.95%)
Others	24 (15.68%)
Injury Patterns	
Crush	51 (33.33%)
Cut	43 (28.10%)
Blunt	38 (24.83%)
Avulsion	21 (13.72%)
Concomitant injuries	
Overall	48 (31.37%)
Multiple trauma and lacerations	36 (23.53%)
Polytrauma	12 (22.64%)

DISCUSSION

This study identified that the prevalence of acute hand and wrist injury among patients presented in the emergency department of a tertiary care center was 12.27%. The finding was slightly higher than what was reported in the literature, which was 2%.⁷ The reason behind the higher prevalence of hand and wrist injuries in our study could be that the prevalence of hand and wrist injuries was

calculated among patients visiting the emergency following trauma whereas in the previous study, it was calculated among all patients visiting the emergency department. Similarly, in this study, the majority of the patients, i.e., 82.35%, had a dominant hand injury. This suggests that these injuries need to be dealt with well to provide satisfactory functional gain. Furthermore, isolated hand injuries are more frequent, with a prevalence of 71.24%. This suggests that there is a strong need for specialized hand surgeons and therapists to manage such injuries.

In this study, the mean age of the patients was 27 years. The finding was similar to what was reported in the studies conducted in Nepal in similar settings, which was around 25-29 years.^{6,7} However, an epidemiological study conducted in Germany involving 435 patients with hand injuries found that the mean age was 39 years.² The reason behind that can be explained by the mechanisms of injury. This study along with two previous studies conducted in Nepal found that RTA was the most common mechanism, with a prevalence of 30-35%.^{6,7} The second most common mechanism of injury was occupational hazard. However, the study conducted in Germany found that leisure and sports injury accounted for the majority of injury mechanisms, with a prevalence of 75%.² This suggests that the younger group of patients are more prone to sustain hand and wrist injuries due to RTA and occupational hazards. In contrast, older patients can sustain such injuries during leisure and sports activities. Similarly, the injury patterns are also influenced by the mechanism of injury. In this study, crush injuries accounted for the majority of injury patterns, with a prevalence of 33.33%, followed by cut injuries at 28.1%. The findings were similar to what was reported in studies conducted in Nepal.^{6,7} Although the exact prevalence is varied because of the different classifications of injury patterns, both studies found that crush injuries and lacerations were the most common injury patterns.^{6,7} Contrastingly, the study conducted in Germany found that the majority, with a prevalence of 74%, were simple cut and blunt types of injuries.² This suggests that injury mechanisms with high energy could result in complex types of hand and wrist injuries, such as crushes and lacerations than with low energy. Furthermore, in this study, concomitant injuries were present in 31.37% of the patients, with multiple trauma and lacerations in 23.53% and polytrauma in 22.64%. Among one-third of the included patients, hand, and wrist injuries were part of associated injuries, which increases the risk of treatment delay leading to increased disability.⁴

This study has some limitations. As a single-center descriptive cross-sectional study, it has study design-related limitations, and the outcomes can not be generalized. Several epidemiological parameters, which could provide substantial information regarding the social impact or burden, were not used in the evaluation. However, as there is a scarcity of such studies in the literature, this study could serve as a background for other studies, and the outcomes of these studies can be used during sample size calculations for further studies.

CONCLUSION

The prevalence of hand and wrist injuries was 12.27% among patients with orthopedic trauma. RTA was the most common

mechanism of injury, followed by occupational hazard. Crush injuries were the most common injury pattern followed by cut injuries. The findings were similar to what was reported in studies conducted in similar settings.

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