

Outline of Hand and Wrist Injuries Presenting to an Emergency of a Tertiary Care Centre in Nepal

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ABSTRACT

Background: Hand and wrist injuries are getting commoner with increasing incidence of injuries and accidents. This study aims to identify the prevalence and pattern of hand and wrist injuries presenting to the emergency department of a tertiary care center of Nepal.

Methods: The study was conducted through review of electronic data of the patient in the emergency department database for the period of 1 Nov 2005 till 31 Oct 2015. Data was extracted in Microsoft Excel 2007 and analyzed to measure incidence and pattern of the hand and wrist injuries.

Results: There were 2899 number of patients with hand and wrist injuries during the period. Most were males (80%) and commonest age group was 20-29 years. Majority of the injuries were due to road traffic accident (n=786, 27.11%), fall injury (n=696, 24.09%), cut injury with sharps (n=404, 13.94%) and machinery injury (n=319, 11%). The commonest presenting injuries were hand fractures (n=1820, 62.8%) followed by distal radius fracture (n=613, 21.1%), crush injury of hand (n=409, 14.1%), and cut injury (n= 406, 14%). Almost half, 48.84 % cases were discharged from the emergency department with preliminary or definitive management.

Conclusions: Hand and wrist injuries constitute a substantial number of cases seen and managed in the emergency department. Therefore, public health measures should be taken to reduce RTI, fall injury and occupational accidents. It is of paramount importance that emergency care giver attends these injuries properly and timely and establishes a good referral system as and when necessary.

Keywords: Emergency; epidemiology; hand injury; Nepal; wrist injury

INTRODUCTION

Hand injuries are one of the commonest injuries worldwide.¹ The hand is extremely vulnerable to trauma through accidents,² occupational injuries,³ farmyard injuries and domestic injuries. There is increasing number of accidents and injuries in Nepal because of rapid urbanization, industrialization, migration and change in lifestyle.^{4,5} Hand and wrist injuries may, thus, be also increasing with the increasing number of accidents and injuries.

Owing to their complex anatomy and function, suboptimal management of hand/wrist injuries can result in persistent pain, disfigurement, disability and loss of function. De putter et al's paper has outlined the economic and social impact of such injuries. He

concluded that hand and wrist injuries cause the significant economic burden with highest productivity cost among all injuries.⁶ Therefore, the purpose of this study was to estimate the occurrence and the pattern of hand and wrist injuries in a tertiary care center in Nepal.

METHODS

We conducted a cross sectional study from the electronic records of the patients presenting to emergency department of B&B hospital. The hospital is a 300-bedded tertiary care center with nearly 8500 patient registrations in the emergency department per year. All the entries made to the emergency department of B&B hospital from 1 Nov 2005 till 31 Oct 2015 were extracted. Records of all the patients with

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injuries around hand and wrist referred to orthopedic department were selected. Ethical approval was taken from NHRC (Nepal Health Research Council). Patient's demography, mechanism of injury and diagnosis were recorded in Microsoft excel 2007 and were analyzed to see the incidence and pattern of the hand and wrist injuries. We have not included patients with hand and wrist injuries referred to other specialty.

RESULTS

There were 38746 patients registered under orthopedic department out of 69219 total patients presenting to the emergency department during the period. Patients with hand and wrist injuries were 2899 which accounts 7.48% of total orthopedics registrations and 4.19% of total emergency registrations. Male made up majority (80%, n=2321) of the cases (Figure 1). The most common age group was 20-29 years followed by 10-19 years and 30-39 years (Figure 2). The majority of the trauma was because of road traffic accident, fall injury, cut injury with sharps, machinery injury, physical assault and others (Table 1). The highest number of injuries occurs in the month of October (Figure 3).

Table 1. Mechanism of injury.

Mechanism of injury	Patients	%
RTA	786	27.11%
Fall injury	696	24.01%
Cut injury	404	13.94%
Machinery injury	319	11.00%
Physical assault	204	7.04%
Door Crush	143	4.93%
Others	133	4.59%
Animal Bite	121	4.17%
Burn	47	1.62%
Ballistic injury	14	0.48%
Sports Injury	12	0.41%
Frost bite	8	0.28%
Post traumatic Infection	6	0.21%
Electric shock	6	0.21%
Grand Total	2899	100.00%

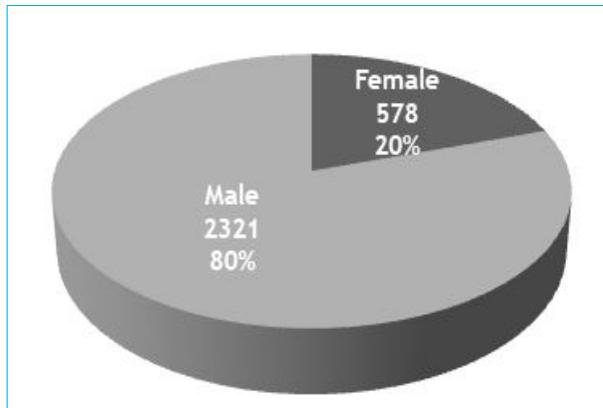


Figure 1. Sex distribution.

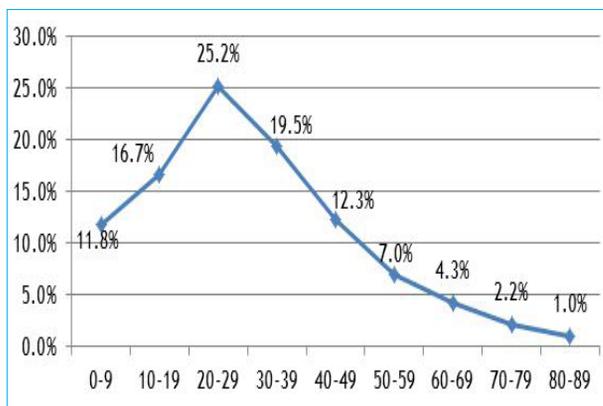


Figure 2. Age Distribution.

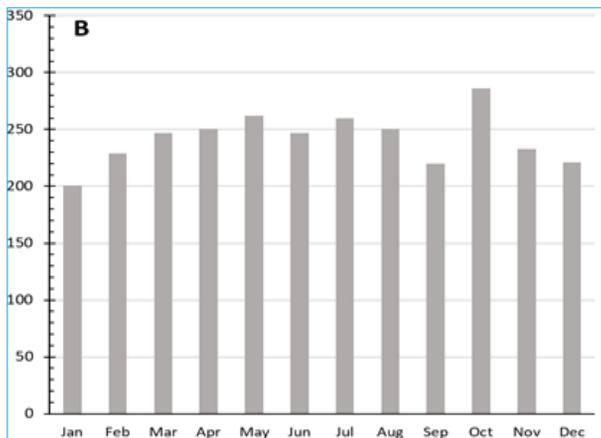


Figure 3. Injury distribution as per months.

Nearly three-fifths (61%) of hand injuries were fractures: hand fractures (n=1819, 46%) and distal radius fracture (n=613, 15%). A quarter (25%) involves hand injuries with possible neurovascular injuries: crush injury of hand (n=409, 10%), cut injury (n= 406, 10%), lacerations (n=137, 3%), and amputations (n=99, 2%). About a tenth (9%) constitutes animal bite (n=121, 3%), nail bed injury (n=119, 3%), and isolated tendon injury (n=110, 3%). Burn, scaphoid fracture, soft tissue injury, dislocation and frostbite make up 5 % (Figure 4).

Among the hand fractures, Phalanx fracture (n=246, 13.5%: distal phalanx- n=123, proximal phalanx- n=90, and middle phalanx-n=32) was the commonest. This was followed by metacarpal fractures (n=204, 11.2%:

fifth (n=78), fourth (n=56), third (n=56), second (n=33) and first (n=15)).Of the fifth metacarpal fractures, the fracture locations were base 45, shaft 4, and neck 29.

Crush injury of the hand was caused by machinery injuries (n=183, 44.7%), door crush (n=87, 21.3%) and road traffic accident (n=65, 15.9%).

Right hand and wrist were involved in 39.15 % (n=1135) and left hand was involved in 30.94% (n=897). In the rest, the laterality was not mentioned. About 10.25 % (n=297) of the hand and wrist injuries were associated with polytrauma or multiple trauma.

48.84 % (n=1416) cases were discharged after preliminary or definitive management from the emergency department and 47.25 % (n=1370) were admitted in the hospital for further treatment (Figure 5).

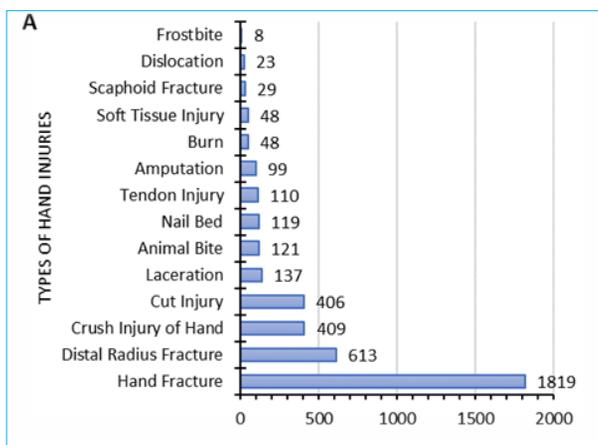


Figure 4. Distribution of injuries.

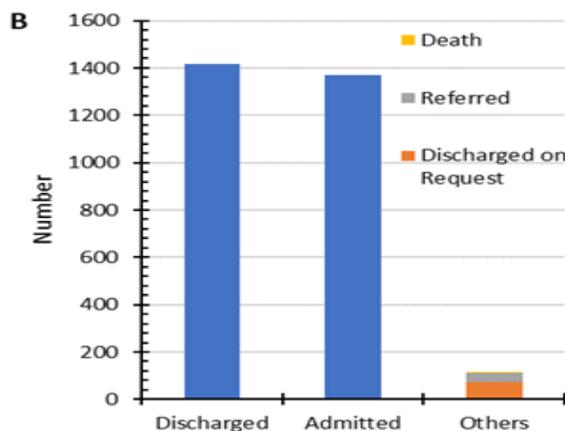


Figure 5. Distribution of outcomes.

DISCUSSION

Worldwide, injuries to the hand and wrist account for approximately 20% of visits to emergency departments.^{2,3} In our study; we found that 7.5% of the orthopedic registration in emergency department was major hand and wrist injuries. The actual incidence may be higher, as minor hand/wrist injuries might not have been recorded especially in case of polytrauma and multiple trauma in emergency. Similar to other studies⁷⁻¹⁰ males and active/productive age groups (10-39 years) were the commonest to get hand/wrist injuries. This pattern correlated with other studies.^{10,11} Injuries to this group presents a considerable economic burden to the nation as they form the labor force, most of who are on daily wages.¹² The productivity is hampered as long-term rehabilitation can cause long work absenteeism.

There were some notable causes of hand/wrist that have important bearing on public health measures. In our study, Road traffic accident (RTA) was the most common cause of hand injuries. Various studies have found that Road traffic injuries (RTI) are a common cause of injury and trauma in Nepal.¹³⁻¹⁵ Karkee and Lee concluded that Nepal suffers heavy burden of RTI with the common sites of injury being lower and upper extremities.¹⁶ Worryingly, RTI ranks 11th among the leading causes of disability-adjusted life years and 12th among the leading causes of premature deaths in Nepal.¹⁷ This strengthens our view that RTA/RTI needs to be considered a public health hazard to curb not just hand injuries in particular, but other injuries in general.

Fall injury was the second common cause for the hand injuries and accounts for 21.97% of cases; these include slippages and falls from height. Globally, fall is the second leading cause of injury-related deaths after RTIs with about 424,000 annual fatalities.¹⁸ According to Gupta et al, fall injuries represent 37.2% of total injuries in Nepal with the upper extremities (hand/thumb, fingers, lower arm, upper arm) involved in 52.1% of all fall injuries.¹⁹ Therefore, more effective preventive measures for fall injuries should be a part of Nepal's public health measures to reduce these kind of complex injuries.

Despite the industrial sector being not highly developed in Nepal, Machinery injury was the fourth common cause of hand injuries. 59.5% of the machinery injuries were crush injuries which need multiple complex surgeries. Pokharel et al. showed that most industrial accidents in Nepal happen in wood, furniture and carpet factories

(66%) where hand-based tasks are common.¹² The productivity and healthcare cost for crush injuries are very high which affect the workers and their employers. Gautam and Prasain estimated that approximately 20,000 workers suffer from accidents at workplace with about 200 lives lost in Nepal annually.³ Taken together, all these indicate meager workplace and occupational safety in Nepal which needs to be rectified.

There is some indication that there might be a seasonality with hand and wrist injuries. Most of the incidents happened in the month of October, a hectic festive season in Nepal. February through July is the last two quarters of the fiscal year of the Nepalese calendar. While the exact causes need to be researched more, we think it is best to emphasize the people to be vigilant during these hectic schedules and festivities.

Hand fractures are the commonest injuries and they are three times more common than distal radius fractures. Globally hand fractures, specifically fracture of metacarpals and phalanges, constitute the most common (10%) fractures.²⁰

Injuries with possible neurovascular injuries warranting exploration (crush injury, cut injury, lacerations, and amputations) make up a quarter. These injuries may need microsurgical management. Crush hand injuries pose very high and permanent morbidity requiring multiple surgeries, long rehabilitation and having a relatively poorer outcome. This highlights occupational and workplace safety as well as the necessity of a trained hand surgeon with microsurgical training.

Lastly, acute burn injury might be less because they usually present to burn hospital; sports injury, dislocation, infection and bites may be less because they rather present to outpatient clinic; frostbite is probably lower due to low incidence or due to mountaineering tourists with frostbite may want to go back to their country for the treatment.

Most hand injuries just receive first aid. Interestingly, our data shows that nearly half of the patients were discharged from the emergency department after receiving preliminary management. This highlights the importance of the emergency health personnel to have basic training on hand/ wrist injuries and understand indication for referral. The first physician to evaluate and treat an injured hand often determines the ultimate outcome of the patient's hand function.²¹ Delayed recognition or improper management of hand injuries can have long-term consequences on patients' daily activity, function, quality of life and work productivity.

This is a retrospective study and only based on the data retrieved from the records of one tertiary care center in Kathmandu, Nepal. The data of most of the minor hand injuries or non-obvious hand injuries may have not been recorded or missed in a case of multiple trauma and polytrauma. Importantly, the data is based on the diagnosis made by the primary care physician in the emergency department with only primary evaluation, so it might not be as reliable as done by the specialists. Nevertheless, this study highlights the basic incidence and pattern of hand and wrist injuries based on which we can have some recommendation for future and help in future studies.

CONCLUSIONS

Hand/wrist injuries constitute a substantial number presenting to emergency. Male in active productive age of 10-39 years are the commonest to get injured. Most injuries are due to RTIs, falls, cuts and machinery injuries. Therefore, public health programs to reduce RTIs and fall injuries and implement work-place safety is recommended. As almost half of the patients are discharged from the emergency, it is of paramount importance that the primary care giver is able to identify, provide first aid, and refer to specialist as and when necessary. Finally, quarter of the cases were injuries with possible neurovascular injuries warranting exploration (crush injury, cut injury, lacerations, and amputations). These injuries may need microsurgical management. This highlights necessity of a trained hand surgeon with microsurgical training.

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