

# Pattern of Hand Injuries in Accidents and Emergency Department of a Tertiary Care Hospital in Karachi

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## ABSTRACT

**Objective:** To analyze the pattern of hand injuries in terms of age, occupation, mechanism, type of injury and structures involved in patients with hand injuries visiting Liaquat National Hospital, Karachi.

**Study Design:** Descriptive case series.

**Place and Duration of Study:** This study was conducted at the Accidents and Emergency Department, Liaquat National Hospital, Karachi from Jan 2015 to June 2015.

**Materials and Methods:** The records of 2367 patients reported for hand injuries were analyzed. Collected data were categorized on the basis of normal handedness, Gender, age, place of injury, mechanism of trauma, types of injuries and its association with different mechanisms. The results were statistically analyzed using mean, frequency and ranges.

**Results:** Hand injuries constitute total 6% of hospital emergency visits with 75% (n=1775) male patients. Right hand dominance (91%) was seen but there was no significant difference in the involvement of right and left hand in injury. Young population (Age 16-35) was found most frequently suffered from hand trauma. Laborer and mechanical workers are the most affected personnel (30.7%) followed by office workers and students 27.3% and 23.9%, respectively. RTA and home were among the most common places of injury. Sharp cut and RTA were the main mechanisms of injury followed by machine/ crush injuries with fracture as the most common type of injury.

**Conclusion:** Young male population is at significant risk of hand trauma. Road traffic accident, industry and home are most common places. Proper understanding of mechanism of injuries and timely referral to hand specialist are key steps in appropriate management.

**Key Words:** Hand injuries, pattern, incidence, mechanism

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## INTRODUCTION

Hands and digits of human beings have a major role in all aspects of daily life. Hand with its 27 muscles and 27 bones is a strong flexible structure. It is able to perform many fine movements. Accidental hand injuries are unfortunately common. Hand injury is more complex because of intricate hand design and if proper care is not given will result in devastating consequences. Injury to the hand leads to loss of function as well as deformity of body image.

It has psychological and financial impacts due to time away from work and medical expenses. Total costs of these injuries in one study were US \$410 million per year<sup>2</sup>. According to one more study average cost per injury was found to be 474.82 IR pounds and 83% of

days lost from work<sup>3</sup>. Opsteegh et al<sup>4</sup> has described Pain, accident location, job independence and symptoms of post-traumatic stress disorder as major factors associated with time away from work. Hand injuries are common accounting for nearly 15% of hospital emergency visits<sup>5,6</sup>. Mismanagement of hand injuries is a frequent problem due to handling by non-hand specialists in emergencies and paucity of literature on pattern of hand injuries<sup>7</sup>.

Epidemiology of hand injuries varies between communities depending on occupation and industrial activities. A thorough Knowledge of biologic, socioeconomic and behavioral factors in hand injuries serve as essential step in identifying the population at risk. Identified risk factors were using malfunctioning equipment/materials, using a different work method, performing an unusual work task, working overtime, feeling ill, being distracted and rushing<sup>8</sup>. Graded exposure to workplace help in treating psychological symptoms like post traumatic stress disorder associated with workplace injury<sup>9</sup>.

The following retrospective study is designed to assess the pattern of hand injuries brought to accidents and emergency department of a tertiary care hospital. This demographic study will help in identifying the location and pattern of the injury and will help in designing a

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comprehensive treatment plan. It will also help to plan a community education program for prevention and appropriate referral of these injuries. Severe hand injuries should be treated in the specialist hand surgery centers. Such proceedings allow to minimize the extent of permanent post-injury disability and decrease total costs of treatment<sup>5,10</sup>.

## MATERIALS AND METHODS

A descriptive case series was designed to evaluate the demographics of hand injury. It was conducted at Accidents and emergency department of Liaquat National Hospital, Karachi for 6 months (January 2015 to June 2015)

### Inclusion Criteria:

1. Isolated hand injuries
2. Patients of all age groups
3. Patients of either gender

### Exclusion Criteria:

1. Patients with polytrauma.
  2. Patients with already repaired hand injuries in some other hospital.
  3. Delayed cases presenting after 72 hours of injury.
- The hospital records including emergency files and operation theatre notes of 2367 patients reported for hand injuries were analyzed. Collected data were categorized on the basis of normal handedness, involved hand in trauma, Gender and age. Data were also analyzed for the place of injury, mechanism of

trauma; types of injuries and its association with different mechanisms. Variables will be analyzed using descriptive statistics. Descriptive statistics include mean, frequencies and minimum to maximum range where applicable.

## RESULTS

A retrospective study was conducted to analyze the pattern of hand injuries presented to Emergency Department of Liaquat National Hospital, Karachi. Out of total emergency visits (39,462), 6% presented with hand injuries (2367) in six months period (1st Jan.-30th June 2015). The records of these 2367 patients were analyzed to see the pattern of hand injuries.

Data suggests that significant number 75% (n=1775) of the patients were male and 25% (n=592) were females (data not shown in figures). With respect to dominance, 91% were right hand dominant and remaining 9% were left hand dominant. While, no significant difference in the involvement of right and left hand was found in this study in contrast to Gupta et al<sup>7</sup>. Young population (Age 16-35) was found most frequently suffered from hand trauma (Figure 1). Laborer and mechanical workers are the most affected personnel (30.7%) followed by office workers and students (27.3% and 23.9%, respectively, (Figure 2). Study reports that RTA and home were among the most common places of injury.

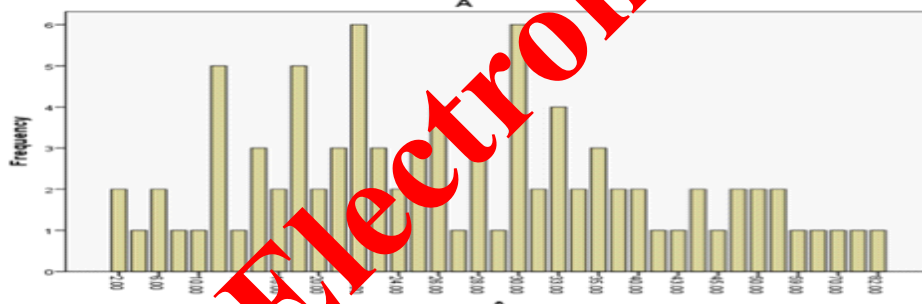


Figure No.1: Data distribution according to age

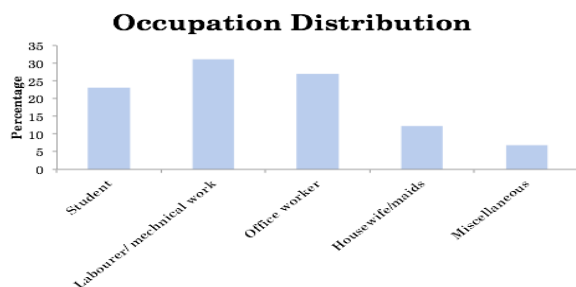


Figure No.2: Data distribution on the basis of occupation

Sharp cut and RTA were the main mechanisms of injury followed by machine/ crush injuries (Fi 3) with fracture as the most common type of injury (Figure 4).

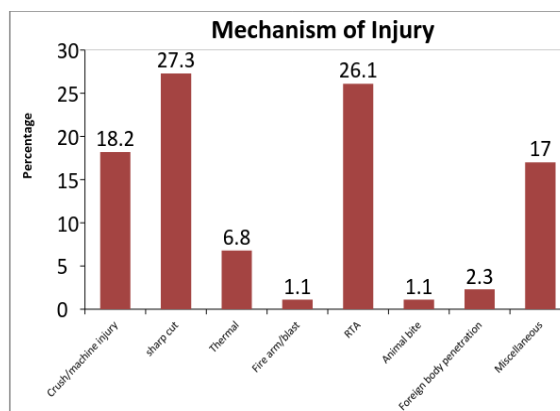
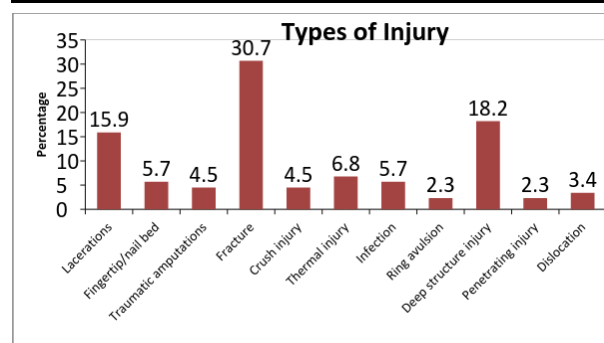
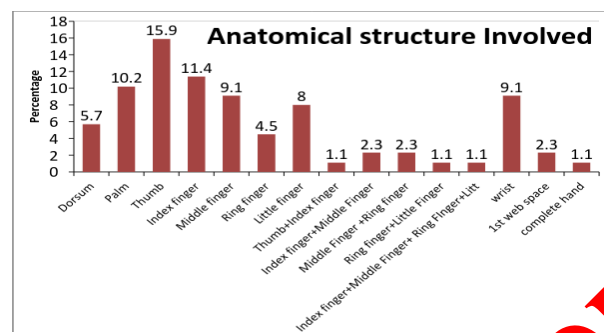


Figure No.3: Data distribution on the basis of mechanism of injury

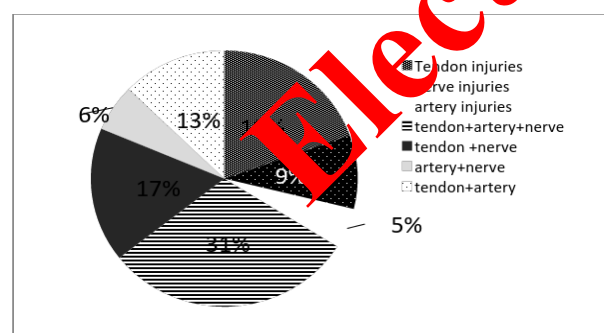


**Figure No. 4: Data distribution on the basis of type of injury**

The data revealed that thumb and index finger was the most frequently involved structures (Figure 5). Significantly highest frequency was observed in soft tissue trauma with the combination of tendon, artery and nerve injury. (Figure 6).



**Figure No.5: Data distribution on the basis of anatomical structure involved**



**Figure No.6: Data distribution on the basis of pattern of soft tissues involvement in hand trauma**

## DISCUSSION

Hand injuries are common posing a significant burden on the Emergency Department of hospitals. They are the cause of serious financial and economical losses not only to individual but the whole society due to time away from work and medical expenses<sup>7</sup>.

A retrospective descriptive case series study was conducted to analyze the demographic and pattern of

hand injuries presenting to ER of a tertiary care hospital.

Data suggest that young (16-35) male were the most effected population as previously been reported by other studies as well<sup>11,15</sup>. With respect to involvement of hand, our data is in accordance to previously published reports suggesting no significant difference between right and left hand<sup>16,17</sup> with right handed as the most affected. Understanding the environmental etiology is the first step for formulating preventive measures. Since Karachi is an industrial city, laborers and mechanical workers are the most common victims of hand injuries. This pattern is similar to the findings of Gupta et al<sup>7</sup> and Ahmed & Chaka<sup>18</sup> where they reported that laborers are the major chunks of trauma. The findings suggest an urge for designing safe and work friendly machines. This finding is in agreement with the next parameter where industry is the most reported site of accident with the frequency of 22%. In our study, home is the second most common site of accident whereas, a few other studies have specified home as the most common place of injury<sup>5,15,19</sup>. Top on the list of place and mechanism of injury is RTA with 35%, suggesting the reckless and law-abiding driving in the community. The second most mechanism of injury is deep lacerations. Combination of tendon, artery and nerve is the most common set of structures involved in deep lacerations, followed by isolated tendon injuries. This type of pattern is also previously studied by Tuncali et al<sup>20</sup>. Our results suggest that fracture is the most common type of injury which is in agreement with Angermann & Lohmann<sup>19</sup> and very close to the observations of Nieminen & Nurmi<sup>15</sup>.

## CONCLUSION

Young male population is at significant risk of hand trauma. Road traffic accidents, home and industries are main sites of hand injuries. Skeletal framework of hand is most commonly damaged during trauma with fractures being the most common. This study has helped in understanding the mechanism and pattern of hand injuries that is important to anticipate damage and guides in making diagnosis and planning treatment.

### Recommendation:

- Following traffic rules can significantly reduce the burden of hand injuries.
- Proper safety measures and careful use of machines should be emphasized to prevent injuries at work.
- Designing safe and work friendly machines.
- Sharp object should be handled with extreme care.
- Creating safe home environment is essential for preventing injuries especially in children.

### Author's Contribution:

Concept & Design of Study: Mehtab Ahmed  
Drafting: Mehtab Ahmed

Data Analysis: Urooj Zafar,  
 Revisiting Critically: Mirza Shehab Afzal Beg  
 Final Approval of version: Syed Sheeraz ur Rahman  
 Mehtab Ahmed

**Conflict of Interest:** The study has no conflict of interest to declare by any author.

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