

## PATTERN OF HAND INJURIES IN A TEACHING HOSPITAL OF A DEVELOPING COUNTRY

KM Shrestha<sup>1</sup>, A Pandey<sup>2</sup>, B Shrestha<sup>1</sup>

### ABSTRACT

#### INTRODUCTION:

Hand injuries are common and are responsible for a significant hospital emergency visit and most of which are seen by non hand specialists. The pattern of the injuries varies from place to place. It is pertinent that those who may come across the patients understand this pattern.

#### MATERIALS & METHODS:

A retrospective review of records of patients presenting with hand injuries to the emergency unit and in OPD unit over two year period was carried out highlighting the pattern of the injury.

#### RESULTS:

The common cause of hand injury in these patients was fodder cutter machines which is 53 patients (30.6%) followed by industrial machines injury in 36 patients (20.8%), road traffic accidents in 30 patients (17.3%), physical assault in 19 patients (10.9%), threshing machines in 13 patients (7.5%), fall in 9 patients (5.2%), falling objects in 8 patients (4.6%), door injury in 2 patients (1.15%) and sports injury in 1 patient (0.5%). The injury was more common in young adults between 15 to 34 years of age with the mean age of 24.5 years. Most of the injury occurred during work by fodder cutter machine and industrial machines or other causes as road traffic accidents. In the present study, 17.3% cases had injury on Saturday comprising 80.9% of males and 53.1% of cases had fractures with high incidence of injury of the Right hand which was 53.7%. Most of the cases having fractures were of Gustilo II variety (28.2%) and 94.2% of cases were of minor to moderate grades of severity of hand injury on grading by HISS grading.

#### CONCLUSION:

Understanding the pattern of injury can impart positively on the management of hand injuries and for its preventive measures.

#### KEYWORDS: Hand, Injuries, Pattern

1. Lecturer, Department of Orthopaedics and Trauma Surgery, Universal College of Medical Science Teaching Hospital, Ranigoan, Bhairahawa, Nepal
2. Associate Professor, Department of Orthopaedics and Trauma Surgery, Universal College of Medical Science Teaching Hospital, Ranigoan, Bhairahawa, Nepal

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#### For correspondence:

Dr. Kishor Man Shrestha,  
Department of Orthopaedics and Trauma Surgery,  
Universal College of Medical Science Teaching Hospital,  
Ranigoan, Bhairahawa, Nepal  
Email: kishor233@yahoo.com

## INTRODUCTION

According to World Health Organization (WHO) data for 2000, an estimated 5.2 million injury related deaths occurred worldwide, comprising almost 9% of all deaths<sup>1,2</sup>. Injuries are the fifth most common cause of death among men and the sixth most common among women, according to the National Burden of Disease study<sup>3</sup>.

In Nepal as per estimates of morbidity and mortality for 1998-1999, injury contributed 9% to total mortality and was the third leading cause, with road accidents occupying the eighth position in the overall ranking<sup>4</sup>.

Especially burden of hand injuries are rising throughout world, constituting between 6.6% and 28.6% of all injuries and 28% of injuries to the musculoskeletal system. These injuries occur mainly during farm and industrial activities; however, they also occur at home, in public venues, in traffic accidents, and during sports activities<sup>5</sup>.

Hand injury contributes moderate to severe disability and morbidity which directly affect the functional capability of the individual. Therefore a rapid and accurate initial evaluation of the injury is needed to reduce the risk.

The objective of this study is to review the cases presenting in the hospital with hand injury with a view to identify epidemiology and causes.

## MATERIALS AND METHODS

The study was conducted from 1<sup>st</sup> September 2011 to 31<sup>st</sup> October 2013, (a period of two year) at Universal College of Medical Sciences Teaching Hospital (UCMS), Bhairahawa, Nepal. UCMS is a tertiary care hospital situated in the West Nepal near the Nepal- India border. All the cases with hand injury who attended the hospital both Emergency and OPD in a above specified time period were included in this study. Specially designed proforma was filled for each patient. Statistical analysis was done by using Statistical Package for the Social Sciences Software (SPSS) Program for windows version 20. The results were presented in tables and charts using the Microsoft Excel 2010 software.

## RESULTS

Between 1<sup>st</sup> September 2011 to 31<sup>st</sup> October 2013, a total of 173 patients attended UCMSTH with sustained hand injury. The injury was more common in young adults between 15 to 34 years of age (Fig.1) with the mean age of 24.5 years. The common cause of hand injury in these patients was fodder cutter machines which is 53 patients (30.6%) followed by

industrial machines in 36 patients (20.8%), road traffic accidents in 30 patients (17.3%), physical assault in 19 patients (10.9%), Threshing machines in 13 patients (7.5%), fall in 9 patients (5.2%), falling objects in 8 patients (4.6%), door in 2 patients (1.15%) and sports injury in 1 patient (0.5%) (Table 1).

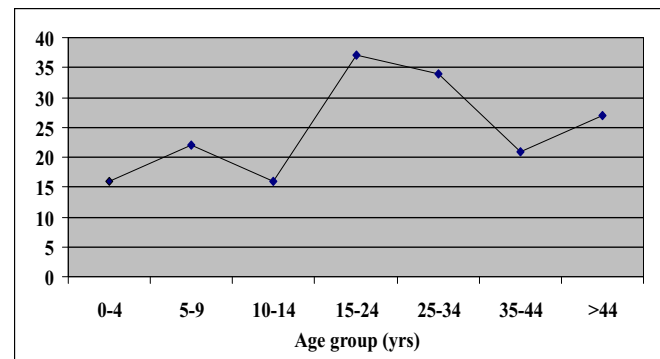


Fig. 1: Age distribution

Cause of Injury	Frequency (Percentage)
Fodder Cutter Machine	53 (30.6%)
Threshing Machine	13 (7.3%)
Physical assault	19 (10.9%)
Falling object	8 (4.6%)
Fall	9 (5.2%)
Factory Machine	36 (20.8%)
RTA	30 (17.3%)
Sport	1 (0.5%)
Door	2 (1.15%)
Others	2 (1.15%)

Table 1: Causes of injury

Most of the injury occurred during work (35.8%) by fodder cutter machine and industrial machines or other causes (32.9%) as road traffic accidents. In the present study, 17.3% cases had injury on Saturday comprising 81% of males and 53.1% of cases had fractures with high incidence of injury of the Right hand which was 53.7%. Most of the cases having fractures were of Gustilo II variety (28.2%) and 94.2% of cases were of minor to moderate grades of severity of hand injury on grading by Hand injury severity Score (HISS) Scale (Fig.2).

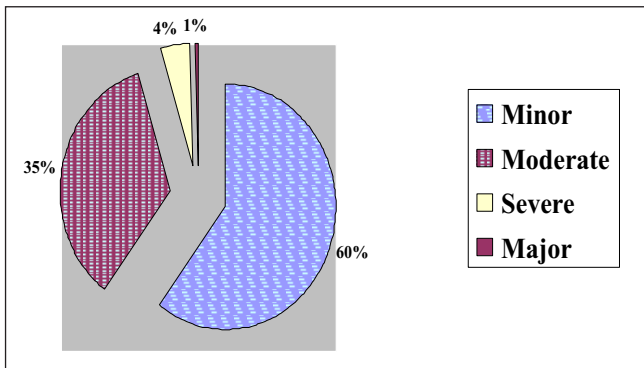


Fig.2: Hand injury Severity Score (HISS) Scale

## DISCUSSION

Hand injuries constitute a significant portion of unintended injuries and comprise 14-27% of unintended injuries treated in emergency departments<sup>5-7</sup>. Although many patients with hand injuries will ultimately require definitive and long-term management by the plastic or orthopaedic surgeon, the presentation for the initial treatment in most patients is to the emergency room, it is therefore important to be aware of the pattern of hand injuries so that optimal and appropriate emergency and follow up care are given and to avoid missing any secondary injuries. Resnik noted that in all cases, careful attention to certain anatomic details along with a sound understanding of different injury patterns should allow an accurate diagnosis to be made<sup>8</sup>.

The predominant male population in this study conformed to most other studies<sup>9-11</sup>. The young adult constitute the main victims of hand injuries (Fig.1). This finding further corroborates the high incidence of injuries in this adventurous age group as reported by other studies.

Even though most patients in this study were right handed, the handedness did not appear to determine the injured hand as the right hand is injured more commonly in both right and left handed individuals. Beaton et al made a similar remark when they noted that there is no association between dominant hand and the hand injured, and that injuries were more common to the right hand among both right- and left-handed individuals in their study of accidental and non-accidental injuries presenting to an ED<sup>12</sup>. Hollis and Watson also found that dominant and non-dominant hands are at equal risk without regard to mechanism of injury<sup>13</sup>.

The work place is the site of most injuries where the young adult 21-30 years were the main victim. This pattern is similar to the findings of Sorock et al in their literature review on the epidemiology of acute traumatic hand injuries where they

demonstrated that young workers 24 years or younger have the highest risk of occupation hand and finger trauma<sup>10</sup>. The home environment constitutes another major site for injuries especially in children. Of those children aged 1-10 year, 83.3% of their injuries occurred at home. Creating a safe home environment will therefore go a long way in reducing the prevalence of injuries in children. Students who had the highest incidence of hand injuries in this study sustained half of their injuries at home while the major part of the other occurred on the road. Drivers sustained most of their injuries on the road while at work. This may explain the highest incidence of injuries arising from road traffic injuries as drivers constitute a large proportion of the patients in this study. The grinding machines caused a significantly high number of injuries. Adigun et al<sup>14</sup> study had raised alarm on the contribution of the grinding machine to the prevalence of severe injuries not only limited to the hand but also to the external genitalia. There is still need to continue effortlessly in the campaign on injuries prevention from grinding machines.

Amputation of the digits is the single most common injury sustained. Even in combination, it is still the injury type sustained by our patients. This may be due to the severity of injuries sustained in road traffic injuries and from the grinding machines, both of which are the two most common causes of injury. That hand injuries caused by mechanical equipments resulted in the most severe of injuries was also noted by Trybus et al.<sup>15</sup> in their article on causes and consequences of hand injuries.

The middle and the ring fingers were the parts of the hand usually injured. Injuries to the little finger were more common than those to the index finger. Road traffic injuries, with its ill defined pattern, being the most common cause of injury may be responsible for that finding.

Half of all hand injuries are fractures<sup>15</sup>. However fractures only occurred in only 21% of injuries in this study. That this is so is not unconnected with the fact that patients who had amputations were classified differently from those with fractures. In a number of cases the tendon is involved in the injuries, a non hand specialist may find it difficult to diagnose this with the far reaching effect on the patient.

A great limitation of this study is that it is a retrospective study posing the problems of incomplete and / or inconclusive data. The number of patient also is small for any major inferences to be drawn. Be that as it may, it should be noted that hand injury is a technical injury to diagnose and manage, and understanding the pattern of presentation will go a long way in assisting with management and understanding the disability associated with it particularly in the younger age group.

**CONCLUSION**

The one who have to manage the Hand injuries should be well knowledgeable on the peculiarities of the injuries. Thus it requires a very good surveillance for the one not to miss any of the potential injuries that will adversely affect in the future. The pattern observed in this study resemble to those observed elsewhere. Therefore the practitioners must improve on their understanding of these patterns from time to time in the interest of the patients who deserve nothing less than the best practice and the focus must be made to minimize such injuries.

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