

# Pattern Of Hand Injuries In A Teaching Hospital Of A Developing Country: A Three Year Review Of Cases

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## Abstract

**CONTEXT:** Hand injuries are common, responsible for a significant hospital emergency visit, most of which are to 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. **METHOD:** A retrospective review of records of patients presenting with hand injuries to the emergency unit over a three year period was carried out highlighting the pattern of the injury. **RESULTS:** A total of 57 patients predominantly males sustained hand injuries. Most of the patients were in their 20s. The injuries occurred mostly at work with road traffic injury been the commonest cause of injury followed by machines. Students and drivers are the main victim, and amputation injury the usual injury sustained. Soft tissue injuries occurred in 76% of cases and bony injuries occur 24% of cases. **CONCLUSION:** Understanding the pattern of injury can impart positively on the management of hand injuries.

## INTRODUCTION

Hand injuries are common, accounting for nearly 10% of hospital Emergency Department visits<sup>1</sup>. The hand with its 27 muscles and 27 bones is strong, flexible and able to perform many fine movements. In view of this intricate design and function of the hand any injury to the structures of the hand carries the potential for serious handicap. A rapid and accurate initial evaluation therefore remains the goal in reducing this risk. Diagnosis and treatment of significant hand injuries are very complex and should be performed by a specialist. In this regard the plastic or orthopaedic surgeons are mostly involved in the management of the hand injuries; however the initial presentation is to the emergency ward where they are seen by the non-specialists who may not thoroughly understand the peculiarity of the hand injuries and their management. The dilemma in management is compounded by the paucity of literature on the pattern of hand injury in this environment as very few studies had been done in this locality on the pattern of the hand injuries presenting to us. This makes hand injury an often mismanaged injury.

The hand is at risk of injury from a number of causes, ranging from road traffic injuries to occupational hazards to sporting activities to domestic injuries.

This study evaluates the peculiarities of the epidemiology of the various causes of hand injury and the pattern of

presentation in our locality. For the purpose of these study the fingers, thumb and the palmar and dorsal surfaces of the hand are considered as a single anatomical unit – the hand.

## METHOD AND PATIENTS

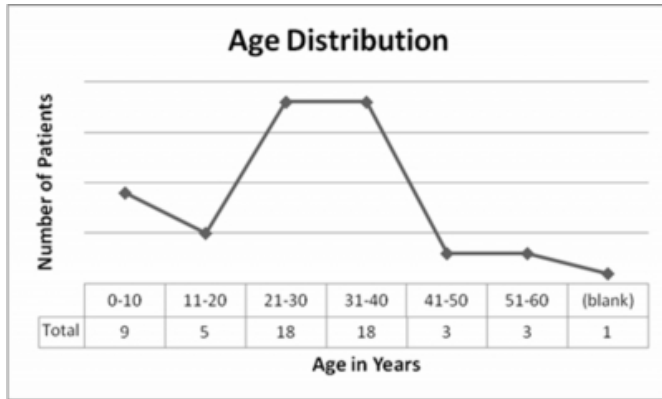
A retrospective study of patients that presented to the plastic surgery unit with hand injuries over a three (3) year period from 2005 to 2007 was carried out. The case files of these 57 patients that were managed in the division over this period were retrieved and analysed. The demographic data: age, sex, occupation, as well as the handedness, place and cause of injury were retrieved and inputted in a database created using the Statistical Package for Social Science version 13. The hand injured was noted as well as the part of the hand injured; digits, dorsum and / or palm, finger(s) and structures injured were also retrieved for each patient. A descriptive analysis of the data was done by invoking the frequency parameter of the SPSS. The results were presented in tables and charts using the Microsoft Excel 2007 software.

## RESULTS

There were 51 (89.5%) males and 6 (10.5%) females among the 57 patients managed during this period. Two peaks were observed in the age distribution, one at the 0-10 age group and the other at the 21-30 and 31-40 age groups, with the highest incidence at the latter (Figure 1).

**Figure 1**

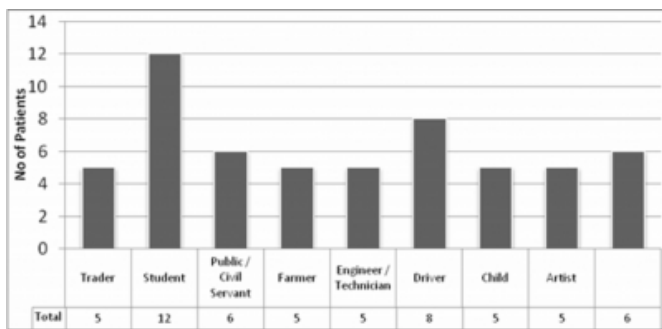
Figure 1: Age Distribution



Students and drivers are the commonly injured group in this study, others occurred with almost equal frequency (Figure 2).

**Figure 2**

Figure 2: Figure illustrating the occupation of patients



Out of 30 patients whose handedness were recorded, most 29 (96.7%) patients were right handed and the remaining 1 (3.3%) was left handed. The right hand was injured in 38 (66.7%) patients, the left in 15 (26.3%) and both hands in 3 (5.2%) patients. The injuries occurred at work, home, road, and school in 19 (33.3%), 14 (24.6%), 12 (21.1%), and 1 (1.7%) patient (Figure 3a).

**Figure 3**

Figure 3a: Place of injury

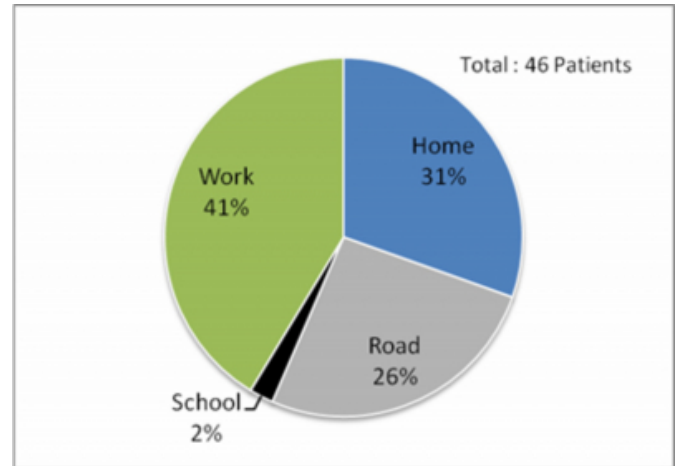
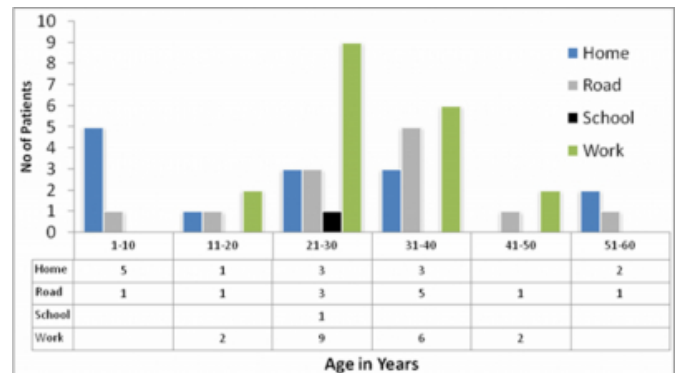


Figure 3b shows the relationship between the place of injury and the age group; most of the injuries in the 0-10 year age group occurred at home, road and work place injuries became more frequent in adults.

**Figure 4**

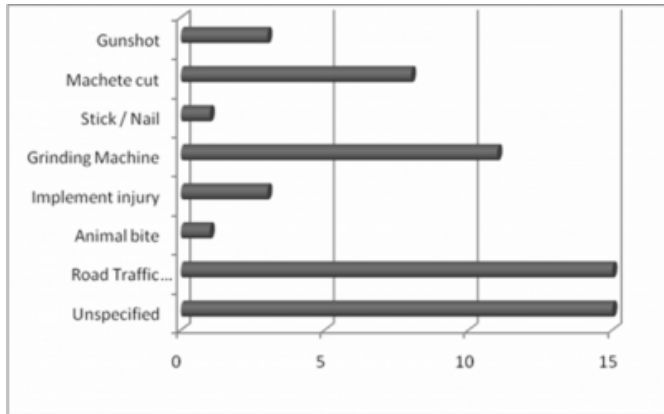
Figure 3b: Figure showing the relationship between the place of injury and age group



Road traffic injury, grinding machine and machete cut accounted for most injuries, representing 15 (26.3%), 11 (19.3%) and 8 (14.0%) patients respectively (Figure 4).

Figure 5

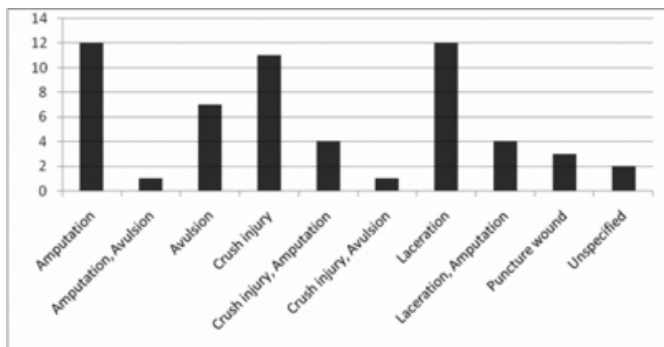
Figure 4: Aetiology of Hand Injury



Amputation injuries is the most common injury sustained followed by laceration and crush injury. The frequency of occurrence of the injuries is illustrated in figure 5 below.

Figure 6

Figure 5: Description of the injury sustained



The middle and ring fingers were injured in 23 (40.4%) patients each, followed by the little finger, index finger and thumb in 20 (35.1%), 16 (28.1%), 12 (21.1%) patients respectively (Table 1). Figure 6 shows the incidence of injury sustained by the various part of the hand either singly or in combination.

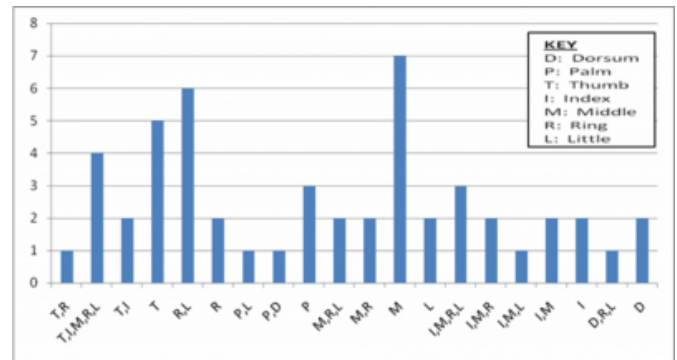
Figure 7

Table 1: Showing the frequency of injury of various parts of the hand

Digit	Number of Injuries
Thumb	12
Index	16
Middle	23
Ring	23
Little	20
Palm	5
Dorsum	4
Unknown	6
<b>Grand Total</b>	<b>109</b>

Figure 8

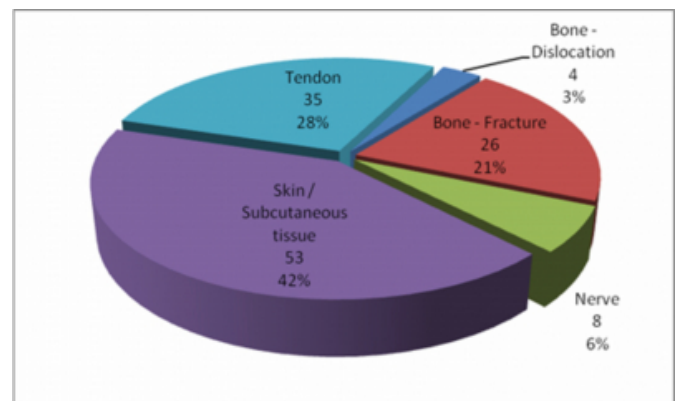
Figure 6: Illustration of the combinations of parts injured



The skin, tendon and bone were the commonly injured structures in this study with tendon injuries more frequent than bony injuries (Figure 7).

Figure 9

Figure 7: Structures injured



**DISCUSSION**

Hand injuries occur commonly. 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>2</sup>.

The predominant male population in this study conformed to most other studies<sup>3,4,5</sup>. The young adult constitute the main victims of hand injuries. 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>6</sup>. Hollis and Watson also found that dominant and non-dominant hands are at equal risk without regard to mechanism of injury<sup>7</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>4</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>8</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 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>9</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.

## **CONCLUSION**

Hand injuries require very good surveillance for one not to miss any of the potential injuries with its / their far reaching effect(s) on the patients. Any one who may have to manage the injuries should be well knowledgeable on the peculiarities on the injuries. The pattern observed in this study bore so much resemblance to those observed elsewhere. The onus is therefore on practitioners to improve on their understanding of these patterns from time to time in the interest of our patients who deserve nothing less than best practise.

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