

PROFILE OF HAND INJURIES IN A SPECIALIST HOSPITAL IN A DEVELOPING COUNTRY.

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ABSTRACT

BACKGROUND: Hand injuries are common in this environment. They are rarely life threatening but can cause serious handicap. There is paucity of studies addressing the pattern and management of hand injuries in this locality.

PATIENTS AND METHODS: This is a one year prospective study (July 2011 to June 2012). All patients with hand injury that presented to the hospital and met inclusion criteria were recruited. The data was analyzed using the SPSS 17.0. Results were presented in tables, bar and pie charts using Microsoft Excel 2007.

RESULTS: 118 patients presented with hand injuries, representing 5.4% of the total number of patients seen. 8 were excluded from the study. 87 (79.1%) were males and 23 (20.9%) were females. The mean age was 25.7yrs with a range of 0.8 to 80yrs and peak of 21- 30yrs. Students were most commonly affected; 29 (26.4%). The most common cause was domestic accident; 31 (28.2%), while fireworks resulted in 6 (5.5%) of injuries. 10 (9.1%) presented with gangrene. 99 (90%) completed treatment while 10 (9.1%) signed against medical advice and 1 (0.9%) referred.

CONCLUSION: Hand injuries are common with slight variation in pattern. Efforts should be made to reduce the incidence and improve initial care.

KEYWORDS: Profile, Hand Injuries, Developing country.

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INTRODUCTION

Hand injuries are injuries that occur to the region of the upper limb distal to the wrist crease. They are rarely life threatening¹ but carry potential for serious handicap with far reaching consequences more so as hand injuries are more common in the productive age group^{2,3,4}. The hand is the most frequently injured part of the body^{2,5,6,7}. About 5% to 10% of patients seen in the emergency department of hospitals are due to hand injury^{3,8,9}. Such injuries result from a number of causes and can occur at home, on the road, in the offices, in the workshops or even in the field of play or entertainment^{3,9}. There are few studies on hand injuries in this environment which are mostly retrospective and do not reflect some emerging causes of hand injuries.

PATIENTS AND METHODS

A prospective study was carried out at the National Orthopaedic Hospital, Enugu between July 2011 and June 2012. Ethical approval was obtained from the Medical Research Ethics Committee of the hospital. Informed consent and consent to publish were also obtained from the patients before data collection. All consecutive patients with hand injury that presented to the emergency and outpatient departments of the hospital within the period and met the inclusion criteria were recruited into the study. These criteria included: isolated injuries to the hand in all ages, injuries to the hand in association with other injuries and burns injuries to the hand in isolation or association with other body parts. A pro forma designed for the study as part of a part II Fellowship dissertation on The Pattern and Management of Hand Injuries at the Hospital was used for data collection. At presentation, information that was obtained included

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the following: biodata, hand dominance, cause of injury, and examination findings. The data collected underwent descriptive analysis using the Statistical Package for Social Sciences (SPSS 17.0). Results were presented in tables (frequency and percentages), bar charts and pie charts as may be indicated using Microsoft Excel 2007.

RESULTS

A total of one hundred and eighteen (118) patients presented to the hospital with hand injuries within the period of this study. One hundred and ten (110) met inclusion criteria and were included while eight (8) were excluded from the study. This represented 5.4% of the total number of patients that were seen at the emergency department within the period. 96 patients representing (87.3%) presented at the emergency department while 14(12.7%) patients were seen at the Outpatient Department.

The patients were made up of 87(79.1%) males and 23(20.9%) females representing a ratio of approximately 4:1.

The mean age of occurrence was 25.7years with age range of 0.8years to 80years and peak of 21years to 30years (fig. 1).

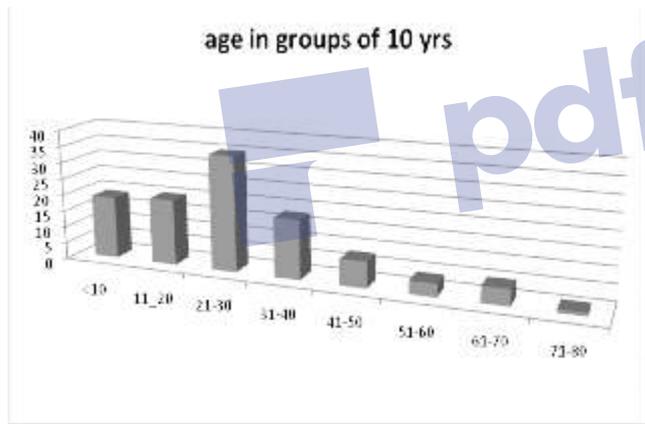


Fig 1 : Bar chart showing age distribution in groups of 10 years.

Students were the most commonly affected group (26.4%). They also sustained the highest number of road traffic injuries and assault. They were followed by the group without occupation (19.1%), mostly children, who sustained mainly burns injury. The technicians/artisans constituted the third largest group (14.5%), and had mainly work-related injuries. (Fig. 2)

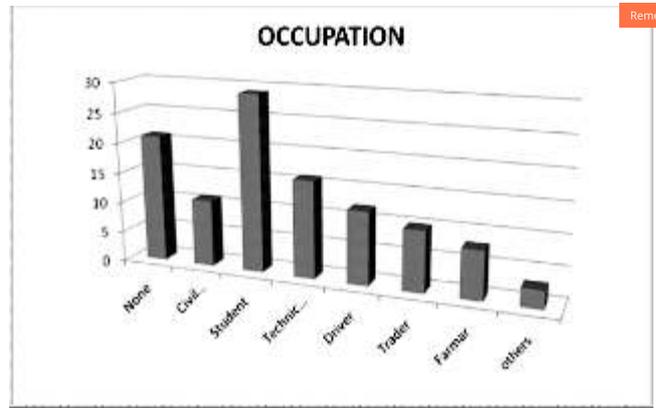


Fig. 2 Bar chart showing patients' occupation

The most common cause of hand injuries was domestic accident (28.2%), followed by road traffic accidents (26.4%). Work related / industrial accidents accounted for 22% of injuries while assault was responsible for 10.9%. Fireworks (pyrotechnic devices) resulted in 5.5% of injuries while 2.7% resulted from sports (3). 61.3% of domestic accidents were burns injuries. (Fig 3) Similarly, 45% of domestic accidents involved children below 10 years and 78.6% of them were due to burns.

The right hand was slightly more commonly injured (50%) than the left (43.6%) while both hands were injured in 6.4% of cases. There was no statistically significant relationship between hand dominance and injured hand, P = 0.54 (Table 1)

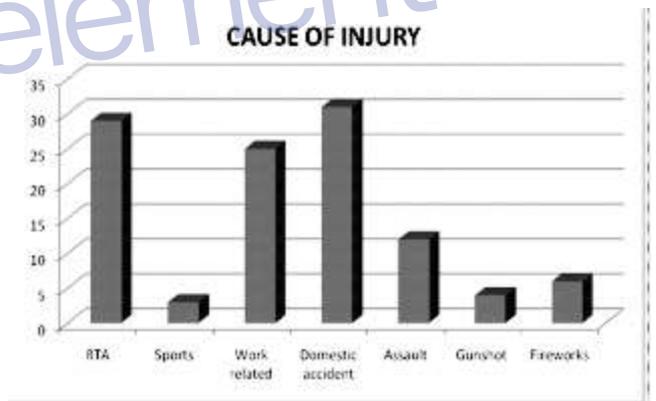


Fig.3: Bar chart showing distribution of Injuries according aetiology

Table 1: Cross table showing correlation between hand dominance and the injured hand.

Injured Hand?	Right	Left	Both	Total
Dominance ▼				
Indeterminate	4	1	1	6
Right	50	45	0	101
Left	1	2	0	3
Total	55	48	7	110
CHI-SQUARE TEST	Value	df	Asymp. significance	
Pearson Chi-Square	3.109 ^a	4	.540	

The most common type of injury based on the mechanism of injury was laceration (23.6%) followed by crush injury (22.7%) and burns (19.1%)(Table 2 and fig. 4-8). About 29.1% of patients had injuries to other parts of the body. Ten patients (9.1%) presented with gangrene and 50% of these had primary wound closure in a peripheral hospital.

Table 2: Frequency table showing types of injury.

TYPE OF INJURY	FREQUENCY (n=110)	PERCENTAGE
Laceration	25	22.7
Crush	24	21.8
Burns	21	19.1
Degloving/avulsion	15	13.6
Amputation	13	11.8
Blunt injury	5	4.5
Abrasion	3	2.7
Penetrating injury	2	1.8
Crush, avulsion, amputation	1	0.9
Laceration, amputation	1	0.9
TOTAL	110	100

One hundred patients representing 90% completed treatment in the hospital one patient (0.9%) was referred, while ten patients representing 9.1% did not complete treatment as they took voluntary discharge

against medical advice. Prominent among reasons for such actions were inadequate fund and belief in traditional healers whose services are apparently cheaper. Eighty two patients (74.5%) had surgical intervention while twenty eight (25.5%) were managed conservatively. About seventy percent of patients required admission for periods ranging from two days to ninety-three days with a mean duration of about fourteen days. About thirty percent were either discharged from the emergency room the same day or had surgery as day cases.

DISCUSSIONS

Hand injuries are common and can result in severe disabilities with far reaching consequences. Generally 5 to 10% of patients presenting to emergency departments of hospitals do so on account of hand injuries as has been demonstrated in this study where 5.4% of patients presented due to hand injuries. The disability resulting from hand injuries has personal economic and social consequences. In other studies just as in this, males are more commonly affected than females possibly due to the fact that men are more involved in jobs that predispose them to hand injuries. In this part of the world where traditional role assignment make women "home keepers" and men "bread winners"¹⁰ in most cases for their families and extended relations, disability of an actively productive man will affect not just him but all his dependants. Hand injuries also affect the society at large in that the productive or potentially productive age group is most commonly afflicted. In this study, most commonly affected patients were in their first to fourth decades of life.

In our series, most patients were right hand dominant which is in keeping with findings in most other similar studies^{3, 9, 11}. The right hand was slightly more frequently injured than the left. However, there was no statistically significant relationship between hand dominance and the site of injury which is similar to what Kaisha and Khainga¹¹ noted in Kenya. The fingers were the most commonly injured parts of the hand with the long and index fingers being the highest. This is consistent with findings in most studies with regards to the long finger^{3, 9} but the index, ring and thumb had different frequency of injuries in different studies.

Domestic accidents accounted for the highest percentage of injuries followed by road traffic accidents and work related injuries. In most other studies^{1, 3, 4, 9}, road traffic and work related accidents were the most common causes of hand injuries. Close to half of domestic accidents involved children below 10 years. Of the hand injuries involving children, more than 70% were due to domestic accidents. This is similar to findings by Olaitan and Ogbonnaya¹² in Enugu.

Mofikoya, Adeyemi-Doro and Enweluzo¹³ in Lagos noted that 34.6% of in children occurred at home. It is important to note that more than half of domestic accidents are due to burns and hand burns constitute 10.9% in this series. In Abuja Ihekire⁷ noted 5% hand burns in his series. In this study, 10.9% of injuries resulted from assault and 3.6% from gunshot reflecting increasing civilian violence as noted by Ihekire et al⁹ in Abuja where 10.8% of hand injuries were due to gunshot, and Al- shamari et al¹⁴ in Kuwait where 10.8% of hand fractures were due to assault.

A significant cause of hand injury discovered in the study which has not been properly reported in this environment is pyrotechnic devices (fireworks). Fireworks were responsible for 5.5% of injuries in this series. The use of fireworks is becoming increasingly rampant especially during festivities in our environment. In the United States, the use of fireworks is regulated by law. They are categorized into two based on their composition and safety profile. The 'consumer' fireworks are designed for the public and are considered safer while 'display' fireworks are designed for professionals.¹⁵ Whether the use, importation and sale of fireworks are regulated in this country is in doubt. The unknowing public is thus exposed to the devastating effect of misuse of these dangerous 'weapons' of entertainment.

The most common type of injury in most studies is laceration as was found in this study. This was followed by crush injuries, and partial thickness burns. Adigun et al⁹ noted amputation as the most common injury but it ranked third with avulsion in this series.

Noteworthy is the number of patients that presented with gangrene of one or more digits; 10 representing 9.1% of patients. Of these, 50% had primary wound closure in peripheral hospitals prior to presentation. This puts to question the assessment and treatment decision on the bases of which these wounds were closed primarily.

About 70% of patients required admission for periods ranging from two days to ninety-three days. About 9% were discharged against medical advice apparently due to inability to fund treatment. This underscores the socioeconomic impact of hand injuries on the populace.

In conclusion, we have demonstrated that hand injuries are common in this environment but their characteristics show slight variation from what has been described in the literature. The high incidence of burns injury noted underscores the need for more public enlightenment on prevention of burns and protection of the most vulnerable group, children. There is also the need to take measures to reduce road traffic accidents in our roads as road traffic injuries have continued to feature prominently in causing morbidity and .mortality. The need for proper training of workers in small scale industries where most work related injuries occurred cannot be over emphasized. Provision of safety measures will further reduce the risk of injuries. Continuing medical education on emergency practice will help our colleagues in general practice in equipping them with ability to assess injuries properly, do the minimal that is appropriate and refer timely. More emphasis should be given to emergency medicine in our medical school curricula. As a good number of citizens cannot afford quality medical care, there is the need to make the National Health Insurance Scheme more comprehensive. It should be able to meet the health needs of the populace. Further studies are required regarding hand injuries resulting from fireworks. This is to elucidate among others, the type of fireworks and the pattern of injuries as well as the laws regulating their sale and use. Meanwhile, there is urgent need to regulate the sales and use of fireworks in the country. The recommendation of the American Society for the Surgery of the Hand¹⁶ that, 'fireworks should be left for the professionals' should be adopted. The long term functional outcome of management of hand injuries in this hospital requires further evaluation.



Fig. 4: Laceration ulnar border of the hand and wrist.



Fig.5: Crush injury of the hand.



Fig. 6: Partial thickness burns of the hand



Fig. 7: Gangrene of the little finger.



Fig. 8: Injury from pyrotechnic device (fireworks).

REFERENCES

- Oluwatosin OM, Adigun IA, Tahir C, Abikoye F, Olawoye OA, Gana J. Pattern and management of hand injuries in Ibadan, Nigeria; a five year review. *The Tropical Journal of Health Sciences* 2005;12:19-22.
- Aggazzotti G, Righi E, Patorno E, Fantuzi G, Fabiani L, Giuliani AR. Work related injuries in young workers, an Italian multicentric epidemiological survey. *Ann Ist Super Santa*. 2006;42 (1): 69-75.
- Ihekire AB, Salawu SAI, Opadele T. Causes of hand injury in a developing country. *Can. J. Surg.* 2010;53 (3) p. 161-166.
- Urso-Baiarda F, Lyon RA, Laing JH, Wareham K, Camp D. A prospective evaluation of modified hand injury severity score in predicting return to work. *International Journal of Surgery* 2008;6(1) p. 45-50.
- Tarr C, Shayne P, Hand Injuries. *eMedicine Health (online)* 2010; 1-14. Available from: http://www.emedicinehealth.com/hand_injuries/article_em.htm. (Accessed 17th November 2010).
- Sabitu K, Iliyasu Z, Dauda MM. Awareness of occupational hazards and utilization of safety measures among welders in Kaduna metropolis, Northern Nigeria. *Annals of African Medicine* 2009;8: 46-51.
- Wilkins K, Mckenzie SG. Work injuries. *Canadian Community Health Survey; Health Report*. 2007;18(3):8.
- Lese AB, Chuang KR. Hand Injury: Soft tissue. *eMedicine Specialties> Emergency> Trauma and Orthopaedics*. (Online) 2013. Available from <http://emedicine.medscape.com/article/826498-overview> (Accessed 5th Jan. 2014)
- Adigun IA, Ogundipe KO, Aderibigbe A. Pattern of hand injuries in a teaching hospital of a developing country; a three year review of cases. *The Internet Journal of Hand Surgery*. 2007;1 (1):1-8.
- Fayomi OO. Strategies for effecting gender balance and the position of the Nigerian state. *International Journal of Violence & Related Studies*.2005;1 (1):95-105.
- Kaisha W, Khainga S. Hand injury: Association of handedness with cause and site of injury. *The Annals of African Surgery* 2007; 1: 29-32.
- Olaitan PB, Ogbonnaya IS. Hand injuries in

- Paediatric age group. African Journal of Paediatric Surgery: 2005;1(2): 67-70.
13. Mofikoya BO, Adeyemi-Doro HO, Enweruzo GO. Paediatric hand injuries at Lagos University Teaching Hospital. Nigerian Quarterly Journal of Hospital Medicine. 2009; 19(3): 148-150.
 14. Al-Shammari SA, Bashir H, Rushdi F. Analysis of hand fractures in Kuwait. Kuwait Medical Journal 2008; 40(2) p. 133-136.
 15. Schnitz G. Hand injuries from fireworks. Indiana Hand to Shoulder Center. (Online). Available from: http://indianahandto-shoulder.com/medical_education_fireworks.html. (Accessed 10th May 2012).
 16. American Society for the surgery of the hand. Hand Safety. (Online) 2008. Available from: <http://www.assh.org/Public/Safety/Pages/FireworksSafety.aspx>. (Accessed 10th May 2012).

