

Jul-Dec 2016

Volume 1 Issue 2

Pages 95-148

journal africain de chirurgie
orthopédique et traumatologique

african journal of
orthopaedics and trauma

Le Journal officiel de la Société Africaine d'Orthopédie (SAFO)
The African Orthopaedic Society Official Journal



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JACOT
Le Journal Officiel de la Société Africaine d'Orthopédie (SAFO)
The Official Journal of the African Society of Orthopaedics (AFSO)
AJOT



Original Article [In English]

Hand trauma epidemiology in a hospital setting in Togo

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Keywords

Africa,
Amputation,
Epidemiology,
Fracture,
Hand trauma.

Level of Evidence

IV, retrospective study

ABSTRACT

Purpose

Hand trauma epidemiological characteristics are lacking in low and middle-income countries. The aim of the study was to determine hand trauma characteristics to be use as a framework for planning hand surgical care in our country.

Material et methods

Registers in Surgical Emergency Department from 1st June 2009 to 31st May 2014 were reviewed retrospectively to determine frequency, socio-demographic of patients and clinical characteristics of hands injuries.

Results

Frequency of hand trauma was 0.7% of all admissions in the Surgical emergency department. The male to female ratio was 3.4:1. Mean age was 28 years. Manual work was the most representative occupation (33.2%). Road traffic accidents were the main circumstances of hand injuries (38%). Open injuries represented 68%. Fractures, dislocation and sprains were seen respectively in 41%, 31%, and 8% of cases. Simple wounds were seen in 38 % of all patients.

Conclusion

Hand trauma seemed to be of low frequency in hospital in our setting. Main injuries encountered are fractures, dislocation, and sprains.

Mots-Clés

Afrique,
Amputation,
Epidémiologie,
Traumatisme de la main.

Epidémiologie des traumatismes de la main en milieu hospitalier au Togo

RÉSUMÉ

Introduction

Il existe peu d'études épidémiologiques des traumatismes de la main dans les pays à faible et moyen revenu. Cette étude avait pour objectif de déterminer les caractéristiques des traumatismes de la main. Ces informations serviront de support dans la planification de l'activité chirurgicale de la main dans notre pays.

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Niveau de Preuve**IV, étude rétrospective****Matériels et méthodes**

Les registres des urgences chirurgicales dans la période du 1er juin 2009 au 31 mai 2014 ont été revus rétrospectivement. Nous avons déterminé la fréquence des traumatismes, les caractéristiques sociodémographiques des patients, et les différents types de lésions de la main.

Résultats

Les traumatismes de la main ont représenté 0,7% des admissions aux urgences chirurgicales. Le sex-ratio était de 3 et la moyenne d'âge de 28 ans. Les travailleurs manuels étaient les plus concernés (33,2%). Les accidents de la voie publique étaient les circonstances les plus fréquentes (38%). Les traumatismes ouverts ont représenté 68% des lésions. Les fractures, les luxations, et les entorses ont été notées dans respectivement 41%, 31%, and 8% des cas. Les plaies simples représentaient 38% des traumatismes.

Conclusion

Cette étude suggère que la fréquence les traumatismes de la main semble faible dans notre contexte. Ils sont dominés par les fractures, les luxations et les entorses.

INTRODUCTION

Hand is not simply an anatomical part of the body. Hand is implicated in most of all daily activities, job and homework as well. Many studies consider hand to be the most frequent part of the body involved in home activities related trauma, manual jobs and road traffic accidents, and even in assaults¹⁻⁶. Hand trauma is known to be cost expensive for patients but also time consuming (long operative time, and need of long follow up), need of expensive equipment and special training for the surgical team⁷. Hand trauma may lead to important functional impairment that at remote would be responsible of job lost and neighbouring depending especially in inappropriate or care delay setting^{3,6}. Hand trauma epidemiological data are lacking in the literature especially in low and middle-income countries⁸. In the US, this gap has been filled in not far than 2001 by a retrospective study conducted by Chung et al.². Epidemiological characteristics of hand trauma are the best data to rely on when planning prevention campaigns and hand care unit inside a trauma centre. In Togo, to the best of our knowledge, there has been no publication about this subject till now. This study aimed to determine hand trauma characteristics to be use as a framework for planning hand surgical care that is still in embryo step in our country.

MATERIALS AND METHODS

The "CHU Sylvanus Olympio" is a tertiary care teaching hospital in Togo located in the capital Lomé. This hospital

has the main surgical emergency department, receiving patients from the capital and all over the country. Therefore, most of patients presenting with hand trauma from any part of the country are admitted in the Emergency Department (ED) of this hospital. Patient's demographic (name, age, address, job, cause of accident), main clinical diagnosis and outcome characteristics were recorded in the registers of the ED by resident surgeons on-call. This was a retrospective study based on data contained in registers of the SED. We included all patients admitted for hand trauma recorded in these registers in the period from 1st June 2009 to 31st May 2014. Cases of hand trauma admitted that were not recorded, and those with insufficient information were not included.

In this study, hand has been defined as the anatomical part of the upper limb below to the wrist. Thus, wrist injuries have not been included. Socio-demographics, (sex, age, job), and circumstances of the trauma were documented. Occupations were categorised into manual works (labours and all type of craftsmen's in all fields), functionaries (people working in offices), students, and others (not classified in any of the previous groups as jobless people, children under age to attend primary school). Clinical features were type of injury (open or closed), anatomopathology (wound, strain, dislocations, fracture, nerve or tendon rupture).

Total amputation referred to non-viable amputation thus the amputated part may not survive without a vascular anastomosis. Subtotal amputation was considered that survive without need of a vascular anastomosis. Simple wounds did not involve underlying structures as tendons, nerves, major vessels, bone, or joints. We defined open injuries as injuries leading to skin wound and underlying structures rupture, burns, and crush injuries. All data were

Table 1 :Details of patients

	Number (n)	Percentage (%)
Sex		
- Male	275	78
- Female	80	22
Age		
- Adult (≥ 16 years)	319	90
- Children (< 16 years)	36	10
Circumstances		
- Road traffic accident	135	38
- Home activities	84	23
- Job related	116	33
- Assault	20	6
Bone and joints injuries		
- Fracture	111	31
- Dislocation	28	8
- Sprain	6	2
Soft tissue injuries		
- Simple wound*	135	38
- Burn	8	2
- Crush injury	4	1
Amputations		
- Fingers	20	6
- Transmetacarpal	3	1
- Subtotal amputation	6	2
- Total amputation	17	5

*wounds with no tendon rupture, no nerve lesion and no major vessel rupture, and that can be close by direct suture.

recorded with the software Epi Info® (Center of Diseases Control, Atlanta - Georgia/ EU). Descriptive statistics represented frequency distribution that were expressed in number and percentage. Figures were drawn with MS Excel® (Microsoft Corp®, Redmond - Washington/ EU).

RESULTS

Within the period under study, 57114 patients were admitted in the ED.

Hand trauma accounted for 417 cases thus a frequency of 0.7%. Incomplete or missing 62 records were not included. The study population was 355 (85.1%) of all hand recorded cases at final. Annually, an average of 59 patients (range 41-72) were admitted in our ED (**Fig 1**).

A total number of 44 (12%) were treated as inpatients while 311 (88%) were as outpatients. The male to female ratio was 3.4:1. Mean age was 28 years (range 1-71 years). Occupation details are depicted in the **figure 3**.

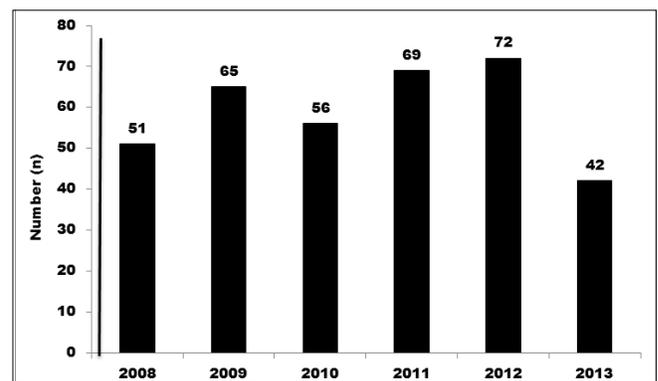


Fig.1: Annual distribution of hand trauma per year in the emergency department

Other occupations represented jobless people and children under age to attend primary school.

Table I shows main socio-demographic characteristics, circumstances of injuries, injuries sustained.

The distribution of patients according to age is displayed in **figure 2**. Occupation details are depicted in **figure 3**.

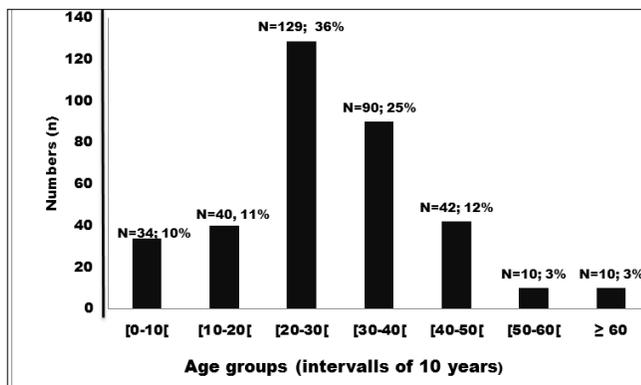


Fig.2: Age distribution in hand-injured patients

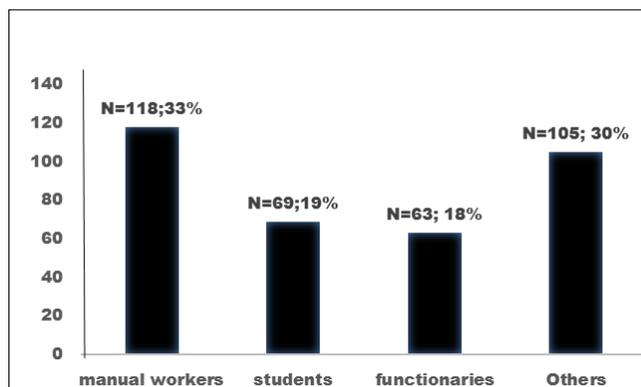


Fig.3: Occupation details of patients presenting with hand trauma

DISCUSSION

In our setting, resident surgeons have the main activity in the ED. Nevertheless, they are not regular and permanent workers in this service. Patients' records were not completed in the same way. This has been the main bias in this study. Many resident surgeons on-call recorded patient's information according to their experience and to daily workload. In case of massive casualties or severe trauma admission, some patients could have not been recorded in the ED registers because of lack of time. Hence, some patients presenting hand trauma associated with other ma-

ior injuries such as extended burns, upper limb injuries involving hands, and other major injuries in which hand could have also been injured have not been recorded as presenting hand trauma. Some clinical features were not clearly specified to allow high degree of precision in this study. All these biases may have impacted the frequency of hand trauma in our study (0.7% of all ED admissions) when compared to what is reported in the literature. In fact, most African and European series reported frequency between 6 and 15% for hand injuries^{3, 6, 8-10}. In the USA, Chung et al.² reported a frequency of 1.5% but this was among a study including hand and upper limb injuries. This frequency was estimated over the whole emergency cases as in our study. Therefore, the low frequency in our study could have been explained by the fact that it has been reported over all admissions in the ED (all traumatic and non-traumatic surgical cases). Age distribution in our study and male patients majority is consistent with findings in the literature^{3,4,6,8,11-14}. Nevertheless, some authors as Chung and al.² recorded a majority of patients aged between five and 14 years old, a children population that have particular setting, with regard of causes and clinical presentation. Therefore Mofikoya et al.¹⁴ found that most of injuries occurring in paediatric population are due to home-related accidents (burns, blunt trauma, and others). Jeon et al.¹⁶ identified adjacent to door injuries to be the most seen in children under four years, and disputes in older children aged more than 10 years old. Precisions with regards to causes among children have not been possible in our study due to aforementioned biases. In adults, many publications have reported causes of hand injuries as well^{3,4,8,10,13}.

While publications both in African and European settings reported work related, home accident and traffic road accidents to be the most common causes, Otene et al.⁶ have found assault to be responsible of the majority of hand injuries in the southern Nigeria. Indeed, assaults have been part causes of hand trauma as well, but in a lower proportion, always carried by thieves, a phenomenon that is unfortunately increasing due to poverty and high level of unemployment. Dias and Garcia-Elias have argued that in western countries, injuries are industrial accidents while in other parts of the world hand injuries occur mostly in agricultural area⁷. Any of our patients presented with hand injuries related to farming activity. We could rather find that they were citizen hand workers, functionnaires, and students. In low and middle-income setting when hand care is not of high-specialised level, prevention should be the mainstay to avoid high money expenditure, and hand disabilities^{6,8}. Sorock et al.¹¹ reported that four to 11 hand injuries occurred for 100 workers per year in the USA. Nayera et al. have found that the most common cause of hand injuries within workers were lack of concentration,

and no usage of security wearing¹⁴. In home-related trauma both in adults and children, vigilance and care could help to prevent many accidents that lead to bone fracture, tendon lesions and nerve injuries. Our study showed bone fractures and joint dislocations, and strains to have the great proportion followed by simple wounds.

Some injuries like nerve rupture even representing only 2% have to be taken into account for hand surgical care planning. These injuries with frequent hand functional impairments need special equipment and special surgical training and have high cost to patient and all the society⁷. Nevertheless, we think that nerve ruptures could have been underestimated due to difficulties for those injuries to be recognized in emergency setting for junior surgeons when magnifying loupe examination is not available. Amputations that were seen in 7% of cases should have the same considerations as they involve nerve injuries, bones, vessels and tendons and require more surgical specialized training and skills, more sophisticated equipment, and more direct and indirect cost⁷.

CONCLUSION

Hand trauma was of low occurrence in our surgical emergency department but the frequency seemed to be underestimated. Many gaps in recording medical information should be filled by further prospective studies to provide extensive data regarding the magnitude of this problem. Socio-demographics, causes and clinical presentations in our setting have had the profile mainly seen in the literature. Fractures and joints dislocations are the injuries most seen but there was a part of nerve rupture and amputations that should not be neglected. ■

CONFLITS D'INTÉRÊTS: Aucun déclaré.

RÉFÉRENCES

1. **Trybus M, Lorkowski J, Brongel L, Hlabdi W.** Causes and consequences of hand injuries. *Am J Surg* 2006 ; 192 :52-5.
2. **Chung KC, Spilson SV.** The frequency and epidemiology of hand and forearm fractures in the United States. *J Hand Surg. Am.* 2001; 26 : 908-15.
3. **Oluwafemi AO, Ayodeji OO, Kayode OJ, Esezobor EE.** Epidemiology of hand injuries seen at two teaching hospitals in southern Nigeria. *East Cent Afr J Surg* 2015;20:44-8.
4. **Ahmed E, Chaka T.** Prospective study of patients with hand injury :Tikur Andessa University Teaching Hospital, Addis Ababa. *Ethiop Med J* 2006 ; 44 : 175-81.
5. **Kaisha WO and Khainga S.** Causes and pattern of unilateral hand injuries. *East Afr Med J* 2008;85:123-8.
6. **Otene CI, Ikubor EJ, Idiakhwa OO, Otene OC.** The burden of hand injuries in Delta State, Nigeria. *Int. J of Forensic Med Invest* 2016 ; 2: 20-4.
7. **Dias JJ, Garcia-Elias M.** Hand injury costs. *Injury* 2006;37 : 1071-7.
8. **Grivna M, Eid HO, Abu-Zidan FM.** Epidemiology of isolated hand injuries in the United Arab Emirates. *World J Orthop* 2016; 7 : 570- 6.
9. **Bellemère P.** Pour une campagne nationale de prévention des accidents de la main. *Chir Main* 2003; 22:233-9.
10. **Ihekire O, Salawu SAI, Opadele T,** Causes of hand injuries in a developing country. *Can J Surg* 2010 ; 53 : 161-6.
11. **Sorock GS, Lombardi DA, Courtney TK, Cotnam JP, Mittleman MA.** Epidemiology of occupational acute traumatic hand injuries: a literature review. *Safety Science* 2001; 38: 241- 56.
12. **al Mugren TS, al-Namlah A, Alkerbaidan F, al Otaibi H, al Zimami I.** Epidemiology of the hand and distal forearm fractures at King Abdul-Aziz Medical city, Riyadh, KSA. *J Taibah Univ Med Sci* 2016;11: 86-90.
13. **Rabemazava AZLA, Rakotoariton RCN, Rabemanantsoa T, Solofomalala GD, Razafimahandry HJC.** Epidemiologie des traumatismes de la main en milieu hospitalier malgache. *Revue Tropicale de Chirurgie* 2013 ; 7 : 28-31.
14. **Nayera SM, Amany MS, Amr AO.** Work-related hand injuries treated at a tertiary care hospital. *J Egypt Public Health Assoc* 2014, 89:85-9.
15. **15-Mofikoya BO, Adeyemi Doro HOD, Enweluzo GO.** Paediatric Hand Injuries at the Lagos University Teaching Hospital. *Nig. Qt J. Hosp. Med* 2009; 19 : 148- 50.
16. **16- Jeon BJ, Lee JI, Roh SY, Kim JS, Lee DC, Lee KJ.** Analysis of 344 Hand injuries in a pediatric population. *Arch Plast Surg* 2016 ; 43 : 71-7.