



PAEDIATRIC TRAUMA IN THE SUDAN

Abubakr Elawad*¹, Omer Elamin², Ibrahim Salih Elkheir³, Isam Ahmed Abd Elgalil² and Faisal Nugud⁴

¹Soba University Hospital (Faculty of Medicine University of Khartoum).

²Ribat University Hospital.

³Azaim Alazhari University & Khartoum North Teaching Hospital.

⁴University of Gezira & Gezira National Centre for Paediatric Surgery.

*Corresponding Author: Abubakr Elawad

Soba University Hospital (Faculty of Medicine University of Khartoum).

Article Received on 10/12/2018

Article Revised on 30/12/2018

Article Accepted on 20/01/2019

ABSTRACT

Background: Although major trauma is rather uncommon in children, it is the leading cause of mortality and disability beyond infancy. The spectrum of causes varies with age, but blunt trauma causes the most serious injuries. The purpose of this study was to analyze the patterns of pediatric trauma in Sudan. **Patients and Methods:** This was a prospective descriptive cross-sectional study involving pediatric trauma patients aged 18 years and below and treated in the main paediatric surgery centers in Khartoum and Gezira states over 14-months period. Data was collected using a structured questionnaire. Collected data was then analyzed using SPSS software. **Results:** A total of 278 patients were seen over 14-months period. The majority of them were in the age group between 5 and 10 years (mean 7.32 ± 3.757). Male patients represent 65.34%. The mechanisms of injury identified in this study in descending frequency were: falls (25.4%), road traffic accidents (23.3%), burns (18.6%) and assaults (5.1%). Head injuries were the most common type of isolated injuries encountered (17%) followed by abdominal (11%) and limb injuries (11%). Fifty two percent required different major surgical procedures. There was no statistical significant association between the patterns of injury and the gender or age, except for limb injury. **Conclusion:** Trauma was a principal challenge represents a continuous threat to the lives of children in our country. Males were affected nearly twice as compared to females. Falls, road traffic accidents and burns were the most common aetiologies of childhood trauma in Sudan. The most common type of injuries identified in this study were head injuries followed by limb and abdominal injuries.

KEYWORDS: Trauma, patterns, Outcome.

INTRODUCTION

Paediatric trauma is well known as fundamental cause of childhood mortality, and disability in developed countries while causing more fatalities in developing countries.^[1] Major trauma remains the leading cause of mortality and disability in children.

The spectrum of causes varies with age, but blunt trauma cause the devastating majority of injuries. Traumatic head injuries are by far the prime cause of fatality and disability across all age groups.^[2] Children differ in many ways from adults. Their behavior, risk exposure, body reaction to injury are the major determinants of trauma presentations and outcomes. Small children are more prone to suffer solid abdominal organs injuries such as the spleen and liver due to their relatively weak ribcage. Moreover; the elasticity of their bony thorax makes these injuries possible without overlying bone fractures. The vast majority of these injuries in children can be treated conservatively. Another peculiar characteristic of children is their high body surface

area/volume ratio rendering them very prone to hypothermia.

Among the challenges encountered during paediatric trauma management is their early greater reserve to compensate, followed by rapid decompensation. This requires managing paediatric trauma patients in specialized paediatric trauma centers by experienced trauma teams. Additionally, paediatric patients must receive their resuscitation whether fluid or drugs based on their actual weight and not rough estimates. In addition, 90% of all childhood injuries are considered both predictable and preventable.^[3]

In Africa, There are several published data on paediatric injuries and the overall incidence is not known. Nearly 1million deaths are estimated annually in developing countries.^[4]

In Europe, paediatric trauma accounts for 23% of childhood mortality in the age group 0–19 years from all

causes.^[5] In the United States, 15 000–20 000 paediatric deaths occur annually out of 1.5 million childhood traumas.^[6]

Fatal childhood injuries are associated with poor socio-economical status and poor housing conditions.^[7]

In Sudan, paediatric trauma represents a major but neglected national health burden on the country's health services with regard to mortality and long term disability among childhood population. Moreover, paediatric trauma currently constitutes a common cause of hospital admissions in most of the surgical A & E departments all over the country.

PATIENTS AND METHODS

This study was a descriptive multicenter cross-sectional study involving paediatric trauma patients treated in the paediatric surgery centers in Sudan (Omdurman teaching hospital, Khartoum teaching hospital, Ribat university hospital, Khartoum north teaching hospital and the Gezira national centre for paediatric surgery) over a 14-month period from November 2015 to January 2017. The study included all pediatric injury patients aged 18 years and below presenting to the A & E departments during the study period following any kind of trauma. Demographic and clinical data were collected by questionnaire. Statistical analysis performed using the

SPSS software for windows (V23). Informed consents were obtained from the participants (guardians). Information explaining the aim of the study was provided orally and in writing. An ethical approval was obtained from the EDC, SMSB.

RESULTS

During the period of data collection from November 2015 to January 2017, 267 children were enrolled in the study. The majority of the participants were in the age group between 5 and 10 years (mean 7.32 ± 3.757) (figure1). Out of them, 65.34% were males, while 34.66% were females. The most common mechanisms of injury identified in this study were falls (from a height onto a hard surfaces and during out-door play) (25.4%), road traffic accidents (23.3%), burns (18.6%) and assault (physical assault) (5.1%) (Table 1). Head injuries were the most common type of injuries encountered (17%) followed by abdominal injuries (11%), limb injuries (11%), pelvis and perineum (5%) and thoracic injuries (2%) (Figure 2). With regard to the treatment received, 47.2% underwent minor procedure, while 52.8% required different major surgical procedures (Table 2). Almost 47.5% of patients were admitted to the hospital for more than 3 days compared to almost 34% who were discharged home on the same day (Table 3). Children who suffered burn and head injuries were more likely to require admission for longer time.

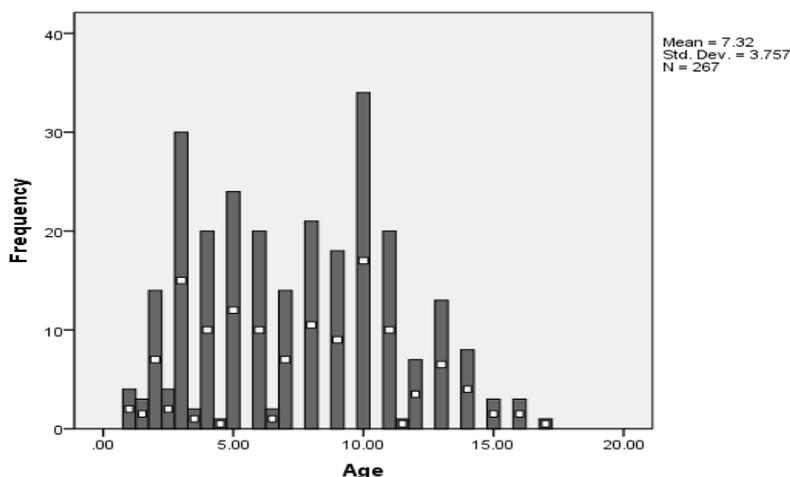


Figure 1: Age distribution.

Table 1: Mechanism of injury (n=236).

Mechanism of injury	Frequency	Valid Percent
Falls	60	25.4
RTA	55	23.3
Burn	44	18.6
Assault	12	5.1
Stab injury	7	3.0
Non-accidental injury	7	3.0
Bites (animal/human)	6	2.5
Sport	3	1.3
Gunshot	3	1.3
Others (combined)	39	16.5
Total	236	100.0

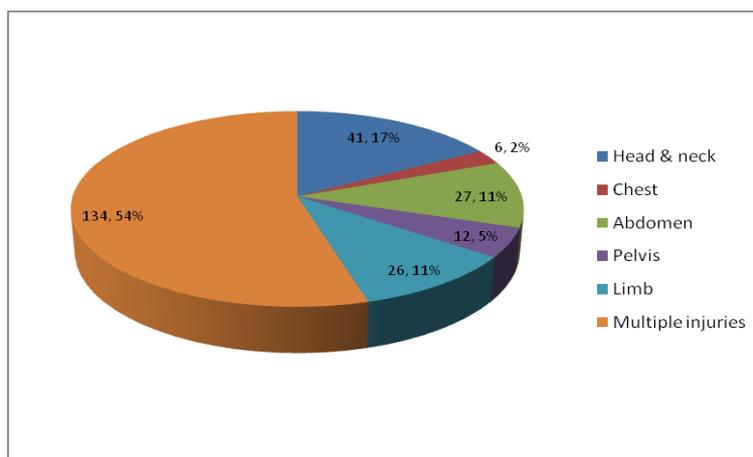


Figure 2: Distribution of injuries by anatomical region (n=246).

Table 2: Treatment received (n=235).

Management plan	Frequency	Valid percent
Minor procedures	111	47.2
Major procedures (Laparotomy, Thoracostomy tube, bone fixation, skin graft,..etc)	124	52.8

Table 3: Hospital stay (n=240).

Outcome	Frequency	Valid percent
Hospitalization > 3 days	114	47.5
Hospitalization < 3 days	42	17.5
Discharged on the same day	81	33.75
ICU admission	3	1.25

DISCUSSION

The present study focuses on the patterns of paediatric trauma in five paediatric surgery centers in Khartoum and Gezira States. In this study the male to female ratio was almost 1.9:1 which is similar to a published study from Nigeria.^[8] This male preponderance is explained by the male behavior and lifestyle characteristics, which encourages them to stay outside with their peers putting them at increased risk of injury. Age distribution showed bimodal pattern (0-5 years and 6-10years) (figure 1) which is similar to a study on paediatric trauma in Nigeria.^[9] Children under 5-years may be exposed more to hazards of the home environment like burn and sharp objects. Between 5 and 10 years are usually exposed to unattended outside home environmental hazards. Falls were the main cause of paediatric trauma in this study followed by road traffic accidents, burns and assault. This is in agreement with studies published by HK Herbert *et al*^[10] but differs from the trend shown by Muhammad Oboirien^[9] and Muhammad Zafar.^[11] Head injuries, together with extremities and abdominal injuries are deemed to be the most common injuries.

Nearly half of the patients were admitted for more than 3 days. Those patients are likely sustained major injuries that required major procedures such as Laparotomy, bone fracture fixation, skin grafting or ICU admission.

CONCLUSION

Trauma is one of the challenges that represent a constant threat to the lives of our children. Males were affected nearly twice as compared to females. Falls, road traffic accidents and burn were the most common causes of paediatric trauma in Sudan. Head injuries were the most common type of injuries encountered followed by limb and abdominal injuries.

Critical analysis of the causes and risk factors of paediatric trauma can help develop preventive strategies such as mass media campaigns together with public health units to raise the awareness of people in the general public about the predictable and preventable childhood injuries.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Katherine k, Anne mw, Aarold s, Jeffrey cg: is a complete trauma series indicated for all paediatric trauma victims? *Paediatr emerg care*, 2002; 18: 75-77.
2. Bruns J, Jr, Hauser WA. The epidemiology of traumatic brain injury: A review. *Epilepsia*, 2003; 44: 2-10.

3. Joffe, A. R., & Lalani, A. Injury admissions to pediatric intensive care are predictable and preventable: A call to action. *Journal of Intensive Care Medicine*, 2006; 21(4): 227-23.
4. Deen jl, Vos t, Huttleysra: injuries and non-communicable diseases: emerging health problems of children in developing countries. *Bull world health organ*, 1999; 77: 518-524.
5. Raymond Simon et al. Paediatric injuries at Bugando Medical Centre in Northwestern Tanzania: a prospective review of 150 cases. *Journal of Trauma Management & Outcomes*, 2013; 7: 10.
6. Guyer B, Freedman MA, Strobino DM, Sondik EJ: Annual summary of vital statistics: trends in health of Americans during the 20th Century. *Pediatr*, 2000; 106(6): 1307-1317.
7. Catherine S Birken, Colin MacArthur. Socioeconomic status and injury risk in children. *Paediatr Child Health*, 2004 May-Jun; 9(5): 323-325.
8. Mungadi IA, Abubakar U. Pattern of Paediatric Trauma in North Western Nigeria. *Sahel Med J.*, 2004; 7: 32-5.
9. Muhammad Oboirien. Pattern of paediatric trauma in Sokoto, North West Nigeria. *AJPS.*, 2013; 10(2): 172-175.
10. HK Herbert et al. Patterns of Pediatric Injury in South Africa: An Analysis of Hospital Data Between 1997 and 2006. *J Trauma Acute Care Surg.*, 2012; 73(1): 168-174.
11. Muhammad Zafar et al. Pattern of Pediatric Trauma - An Analysis of Hospital Data at Sheikh Zayed Hospital, Rahim Yar Khan. *PJMHS.*, 2013; 7(2): 429-432.