Original Article

Access this article online
Website: www.afrjpaedsurg.org
DOI: 10.4103/0189-6725.125450
Quick Response Code:

Childhood injuries in a tertiary institution in north east Nigeria

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ABSTRACT

Background: Injury has been recognised as a preventable cause of morbidity and mortality in children. The aim of this study was to determine the aetiology, pattern and location of childhood injuries in north east Nigeria. **Materials and Methods:** This is a 3-year retrospective hospital-based descriptive study. The study included 114 children (77 boys, 37 girls; mean age 6.4 ± 3.2 years; range 2 months to 15 years) who were admitted for various injuries in the female/paediatric surgical ward from January 2007 to December 2009. Information obtained from their case notes included demographic data, mechanism of injury, location of injury, anatomical site of injury and outcome of treatment. **Results:** Records for 114 children (77 boys, 37 girls; mean age 6.2 years; range 2 months to 15 years) were available for analysis. The highest number of injuries occurred in the age group 6-10 years. Home was the most common location of injury among the age group 0-5 years while older children sustained most of their injuries outside the home on the street/highways. Burns from hot water was the most common injury among children aged 0-5 years while pedestrian accident accounted for the highest cause of injury among older children. Fall accounted for 20.2% of the injuries. The most common specific anatomic injury was head injury followed by limb fractures. Two mortalities were recorded (1.8%). **Conclusion:** This study provided useful information on the characteristics of childhood injuries in our environment. There is the need for parents and children education about the risks of injury and preventive measures in addition to legislation and policy on environmental modifications and enforcements to significantly reduce childhood injury.

Key words: Infectious diseases, pedestrian, prevention, trauma

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INTRODUCTION

Trauma as a disease represents an insult on health. It is a global epidemic of our time and in children represents a major cause of morbidity and mortality after the first 12 months of life.[1] Most low income countries are undergoing an epidemiological transition with declining morbidities and mortalities from infectious diseases as a result of success of public health effort by groups such as World Health Organisation (WHO) and non-governmental organisations (NGOs) while injuries especially from road traffic accident is becoming more frequent with little or no attention from relevant group and agencies.[2,3]

The aim of this study is to determine the aetiology and pattern of paediatric injuries in Federal Medical Centre, Gombe, Nigeria with a view to provide insight into its significance and suggest strategies for prevention and care.

MATERIALS AND METHODS

This is a retrospective review of paediatric trauma (0-15 years) admitted in Federal Medical Centre, Gombe, Nigeria from January 2007 to December 2009. Ethical clearance was obtained from the ethics and publication committee of the hospital to carry out this study.

Records of all patients aged 0 to 15 years admitted as a result of trauma into the paediatric ward from January 2007 to December 2009 were obtained from the ward register. A total of 126 patients were admitted over the study period but only 114 (90.4%) case notes were available for review.

Details regarding demographic data, mechanism of injury, anatomical site of injury and outcome were obtained from case notes and entered into a prepared proforma and then personal computer. Data analysis was done with SPSS version 14 software.

All trauma cases in the hospital were admitted via the accident and emergency unit of the hospital where initial resuscitation and stabilization of the patient was carried out by the casualty officer in conjunction with the general surgeon, orthopaedic surgeon and plastic surgeon as the case may be. Further management is carried out after admission into the ward by the respective specialties the based on the injury sustained.

RESULTS

The mean age of the patients was 6.4 ± 3.2 years (range, 2 months–15 years; Figure 1). There were 77 (67.5%) boys and 37 (32.5%) girls with male to female ratio of 2.3:1. The age group 6-10 years was the largest proportion of patients constituting 51 (44.7%) injured patients.

Streets and highways was the most common location of injury (66; 57.8%) followed by home, which accounted for 38 (33.3%) cases. Home was the most common location of injury among children aged 0-5 years while older children sustained most of their injuries on the streets/highways [Figure 2].

Road traffic accident was the mechanism of injury in 57 (50%) patients. Twenty-nine (50.9%) were pedestrian, 15 (31.6%) were vehicle occupants while 10 (17.5%) were involved in motorcycle accidents. Three of the patients involved in motorcycle accidents where riders were below the legal age of 18 years allowed to ride motorcycle.

Thermal injury was the cause of trauma in 24 (21%) patients. Sixteen (66.7%) of these resulted from hot water, 7 (29.2%) were due to flame while 1 (4.2%) was due to electrical shock. Eighteen (75%) thermal injuries occurred in the age group 0-5 years mainly due to hot water while flammable injury occurred mostly among the older age group.

Fall accounted for 23 (20.2%) injuries. Domestic fall from running on level ground or from the top of home furniture accounted for 13 patients (56.5%) while two patients sustained their fall at school. Eight patients (34.8%) sustained their fall from heights such as tree, cattle or horse.

There were eight patients (7.0%) who sustained grinding machine-related injuries. Four cases involved 11 to 15 years age group, three cases in 6 to 10 years age group and one case of a five-year old boy. There were two patients who had their injuries from the collapse of uncompleted buildings.

Head injury was the most common specific and associated injury while tibia/fibula was the most common fracture encountered in this study. Twenty-four patients had more than one anatomic injury.

There were two mortalities (1.8%). One case involved a five-year old male with severe head injury following motor vehicular crash and a 10-year-old female with 65% flame burns [Table 1]. One hundred patients (87.7%) were discharged from the hospital after completion of treatment while 12 patients (10.5%) discharged against medical advice without completing treatment. Eighty-one (72% - 73%) patients never attended follow-up clinic while 31 (27.7%) attended outpatient clinic at one time or the other.

DISCUSSION

Children are most at risk of injury due to their lack of knowledge of the risks, judgemental skills and fear to avoid dangerous situations. The risk is further increased when they are allowed to play

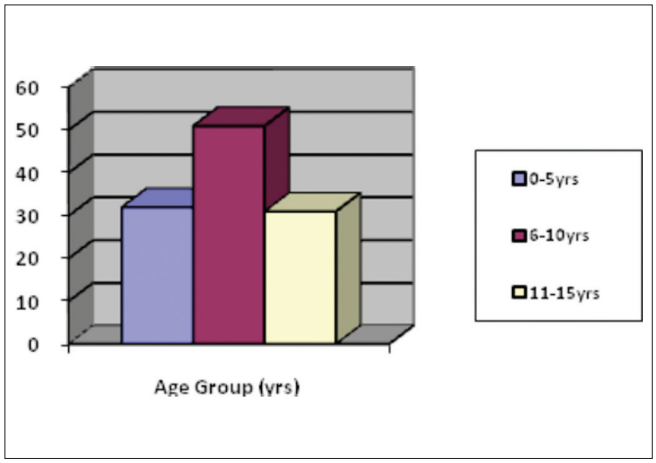


Figure 1: Age distribution (*n* = 114)

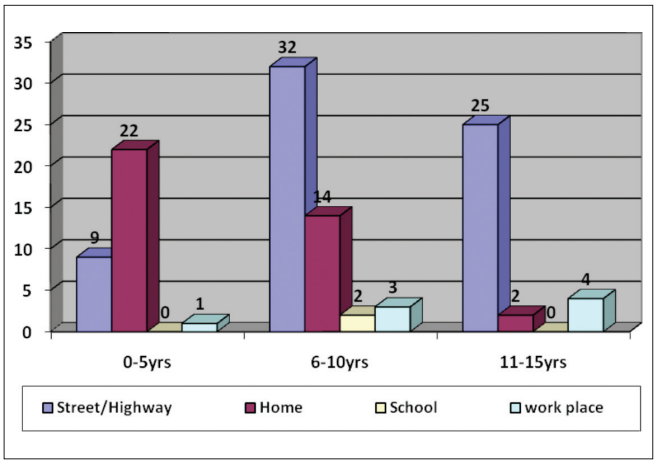


Figure 2: Age group vs. location of injury (*n* = 114)

unsupervised.[4,5] Several factors have been identified that influence childhood injuries, including sex, age, behaviour and environments.[6] All these factors played a significant role in this study.

Male children are more prone to be injured because of their adventurous tendencies, impulsive acts and greater freedom granted to them by their parents.[4] Males constituted about two-thirds of the injured in this study. This is similar to reports from other studies from developed and developing countries.[1,3-6] In contrast to these reports, the study by Adesunkanmi *et al*.[2] revealed near equal male and female proportions.

The mean age of patients in this study was 6.4 years and most of the injured were in the 6- to 10-year age group. This is in keeping with results of other studies.[7-9] The relationship between the age and type of accident in this study showed that road traffic accident and fall are predominant among older age group while burns was predominant among preschool children.

Road traffic accident from pedestrian injury is the most common mechanism of injury among children above the age of five years. Many studies reported similar high proportion of pedestrian injuries among older children.[2,7,10] The high incidence of pedestrian injury in Africa can be attributed to poverty, illiteracy and culture. Children are often left to play, go to school unaccompanied, and also engage in hawking on the street and highways to support the family. Walkways are sometimes not available on the highways and where they are, laws about use of walkways are not enforced.

Fall and burns accounted for 20.2% and 21.0% of the injury, respectively in this study. Sixty percent of the fall occurred among the age group 6-10 years while 75% of the burn injury involved children less than six years of age. Contrary to the finding in this study, fall was the predominant cause of injury in some reports from Uganda,[4] Iran,[8] Pakistan[11] and USA.[12] The report from Pakistan however noted burns as the second leading cause of non-fatal injuries, while the report from Iran did not take account of burns in the various causes of injuries. Burns was reported as the most common cause of injury by Gome *et al*. in Kenya.[13]

Burns are an important cause of preventable injuries in developing countries where outdoor cooking with kerosene stove and charcoal are common practices due to poverty.[4] Informal settlements where home safety is a low priority have also been identified as a major factor for burns risk in Africa.[14] In the current study hot water was responsible for most of the burns injury as widely reported in other studies.[13-16]

Regarding the anatomic region of injury, extremities were the most commonly injured parts followed by head region [Table 2]. This is similar to report by Karbakhsh *et al*.,[8] Adesunkanmi *et al*.[9] and Lasi *et al*.[11] Head injury and burns have been identified as the leading cause of trauma related death in developing countries.[2,4,9,17]

The overall mortality in this study was low but the morbidity, cost and burden on both the patients and parents cannot be overemphasised. The percentage of patients that was voluntarily discharged by their parents before completion of treatment calls for concern. It was not possible to ascertain the reasons for discharge from their case notes. Seventy one per cent of the discharged patients never attended follow-up clinic thereby making it impossible to determine the long term outcome of their injuries.

Injuries have been recognised as a significant public health threat to African children. Injury was the commonest indication for paediatric hospital surgical admission in Gambia[18] and Tanzania.[19] Trauma was also reported as the leading cause of death among children less than 5 years in South Africa.[17] Road traffic accident falls and burns have been widely reported as the main causes of children injury in the developing countries.[4,7,9,11,20] This is in agreement with the findings of this study.

Table 1: Percentage surface area of burns[10]

% Surface area	Frequency (%)
0-19	9 (37.5)
20-39	9 (37.5)
40-59	5 (20.8)
>60	1 (4.2)

Table 2: Anatomic site of injury[1]

Anatomic site	Frequency
Head	32
Abdominal injury (blunt)	4
Chest (blunt)	2
Spine	3
Burns	24
Fractures	
Humerus	6
Radius/ulna	9
Clavicle	2
Femur	4
Tibia/fibula	26
Ankle	4
Foot	6
Pelvic	2

†24 patients had more than one injury

There is the need for educational and interventional programmes to increase awareness and understanding of child safety and injury prevention both at home and outside the home.

The interventions should include educating the policymakers and health professionals, education of children and parents, and legislation and enforcement of change in the environment law.

Trauma prevention will not completely eliminate childhood injuries, thus improving the care of the injured must also be given priority. There is the need to increase the awareness of the community regarding trauma risks, management, early transportation, increase access to quality hospital care and establishment of dedicated trauma centres across the country.

CONCLUSION

Paediatric trauma is more common in the 6-year to 10-year age group. The most common site of specific and associated injury is the head. Up to 25% of these patients can present with multiple injuries. In spite of this, mortality is very low. However, morbidity cannot be accurately assessed in a low resource setting such as ours due to poor follow-up and an unusually high level of rejection/refusal of treatment. It is important that the government puts in place legislation to protect the rights of the child to quality health care. Education of parents and guardians on supervision of their wards and the need to accept care and adhere to follow-up schedules will go a long way in the prevention and management of childhood injuries.

ACKNOWLEDGMENT

We sincerely express our profound gratitude to Miss Hanatu Demba for her role in typing this manuscript.

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Cite this article as: Esin IA, Alabi S, Lawal OA. Childhood injuries in a tertiary institution in north east Nigeria. Afr J Paediatr Surg 2013;10:367-70.

Source of Support: None. **Conflict of Interest:** None declared.