

Paediatric Trauma at a Tertiary Hospital in Niger-Delta, Nigeria: A 5-Year Review.**A. Eighemhenrio, F. Campbell, F. Ejumudu Fred, R. Umuago, I. Usifoh**Department of Surgery, Delta State University Teaching Hospital,
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Background: *Paediatric trauma has become a major cause of mortality and morbidity, disability and socio-economic burden worldwide. It is projected by WHO that paediatric trauma will become the number 1 disease in children by 2020 globally. It constitutes a common cause for admission into many paediatric surgical wards in developing countries putting an enormous strain on the resources and personnel. Most cases are preventable. The aim of this study was to evaluate the common causes of paediatric trauma in a teaching hospital in Niger-Delta region of Nigeria.*

Methods: *The study was a retrospective study of patients who are 15 years and below presenting with history of trauma to the hospital.*

Results: *A total of 412 cases were analyzed with a M: F ratio of approximately 6:1. RTA was the commonest cause (50%), followed by burns (29.3%). Patients between 11- 15 years presented most commonly accounting for 48.7%. Most of the patients were multiply-injured. The ward admission rate was 93.7% while the ICU admission rate was 8.5%. The mortality rate was 19%.*

Conclusion: *The male child is at a greater risk of being involved in trauma arising from RTA and contact sports. Burns from petroleum products contributed largely to the burn cases seen following the high petroleum related activities going on in the Niger-Delta.*

Keywords: Paediatric, trauma, accidents

Introduction

Trauma is a leading cause of hospitalization and loss of valuable school periods in children and adolescents worldwide. Trauma is a leading cause of death among children in the developing countries^{1,2,3}. In Africa, the true incidence of paediatric trauma is not known, however injuries have been estimated to account for 13% of childhood disease burden^{4,5,6}. In developing countries of Africa, trauma is displacing nutritional diseases and infections as a major cause of mortality^{7,8}.

The World Health Organization (WHO) report in 2008 that child injury and death is a major public health problem requiring urgent attention. Paediatric trauma is also expected to be the number 1 disease of childhood by 2020⁸. Paediatric trauma is a single major cause of admission into the paediatric surgical wards in many developing countries of Africa.

In Nigeria, like many other African countries paediatric trauma remain neglected in spite of its huge contribution to public health of these countries. Its impact on the country's health services and economy can be enormous. Most cases of paediatric trauma are preventable. The caregivers and parents have major roles to play in preventing this problem. The society and government can contribute by relevant policies and infrastructure such as good and motorable roads and standard transport systems.

The high mortality rate seen in many locations in Africa can be attributable to late presentation, poverty, ignorance, poor social amenities and local beliefs. The aim of this study was to determine the aetiology and other attributes of paediatric trauma in Niger-Delta Teaching Hospital in Nigeria.

Patients and Methods

The article is a retrospective study of patients who were 15years and below presenting with history of trauma to the accident and emergency unit of the hospital. A few cases of trauma were seen in the surgical out-patient clinic and were incorporated into the study. Information was obtained from case notes retrieved from the medical records department. The data obtained from the case notes included type of trauma, age, sex, operative notes, type of treatment given, admission and discharge records. The study period was from January 2010 to December 2014, a 5year period. The data was analyzed using Statistical Package for social sciences (SPSS) version 16.0. Chi-square tests were performed to compare variables. A P-value of <0.05 was considered statistically significant.

Results

There was a total of 412 case notes that had complete records for analysis. The males accounted for 350 (85.0%) and females were 62 (15.0%). The M: F sex ratio was 6:1. Analysis revealed that road traffic accident (RTA) accounted for 206(50%), making it the highest cause of paediatric trauma in our hospital. This was followed by burns which had a total of 121(29.3%) cases. The other causes of paediatric trauma are as shown in the table below (Figure 1).

The RTA included cases of passenger/vehicular accidents, passenger/motorbike accidents, pedestrian/vehicular accidents and pedestrian/motorbike accidents. The largest volume was seen in passenger/motorbike accidents accounting for 102(24.8%) of total cases of RTA. Passenger/vehicular accidents had 67 cases, pedestrian/motorbike 13 and pedestrian/vehicular 30 cases

The cases distribution showed that more cases were seen in 2012 with 102 cases (24.8%). This was followed by 2010 with 96 (23.3%) of cases. Paediatric trauma was observed in this study to be commoner around the fourth quarter of each year (56.6%) and least in the first quarter of the year (16.9%). The age distribution of children presenting with trauma revealed that most were in the age range of 11-15 years accounting for 201(48.7%) of the total. The 0-5year age group accounted for the least number of cases 16(15.7%). The incidence of RTA increased with age of the patient as seen in table above

Table 1. Common Causes of Paediatric Trauma

Cause	Total		Males		Females	
	Number	No	Number	Percent	Number	Percent
RTA	206	50	173	83.9	33	10.1
Burns	121	29.3	105	86.7	16	13.5
Fall from height	53	12.8	50	94.3	3	5.7
Fight	15	3.6	11	73.3	4	26.7
Assault/battery	10	2.4	4	40.0	6	60
Contact sports	7	1.6	7	100	-	-

Table 2. Common Causes of Trauma with Age

Age range	Number	RTA	Burns	Fall from height	Contact sport	Assault	Fight
0-5 years	72	14	52	6	-	-	-
6-10years	99	63	23	6	-	3	1
11-15years	241	129	43	41	7	7	14

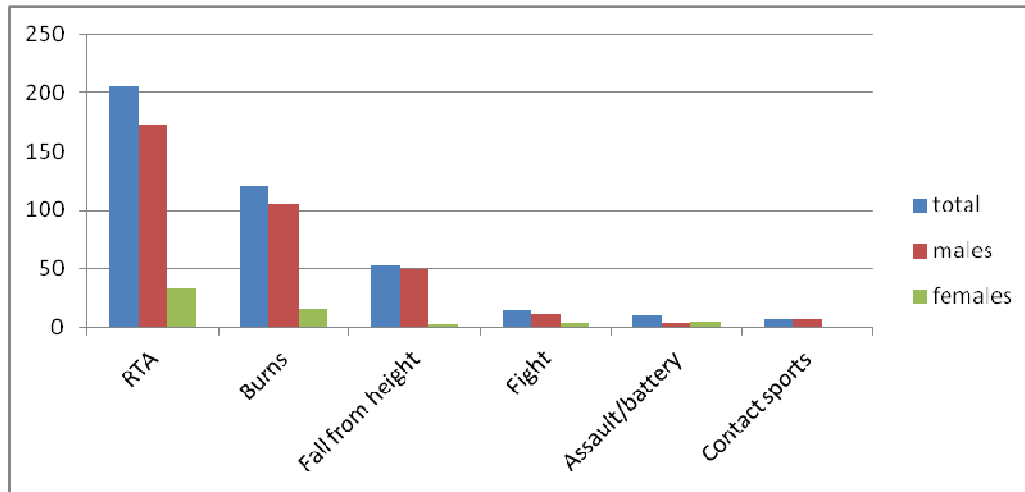


Figure 1. Common Causes of Trauma

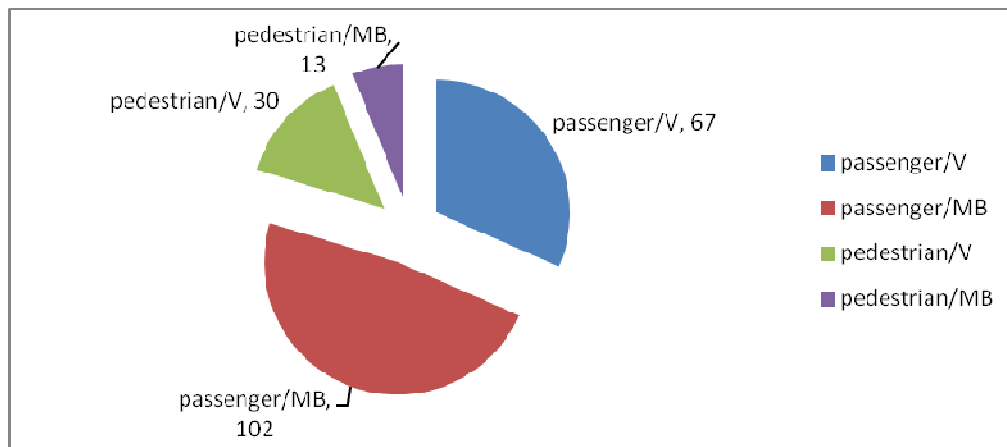


Figure 2. Forms of RTA

It was also observed that most of the patients were multiply injured with involvement of more than one system of the body. This made up 286(69.4%) while 126 patients (30.6%) had single system involvement.

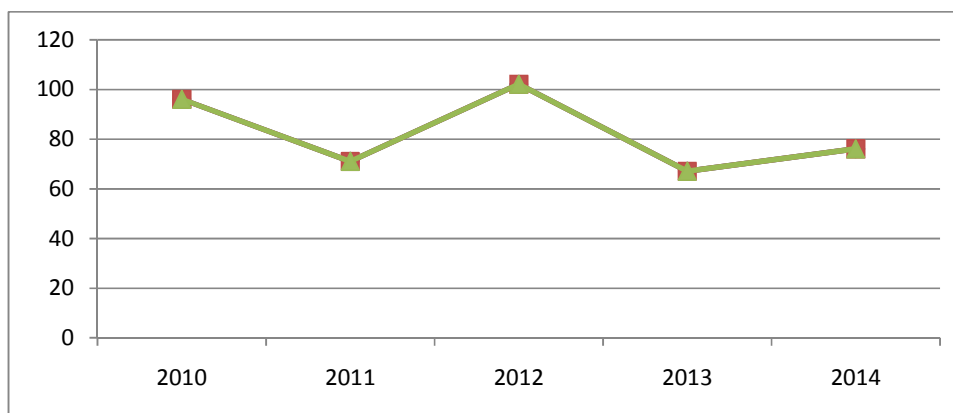


Figure 3. Case distribution per year

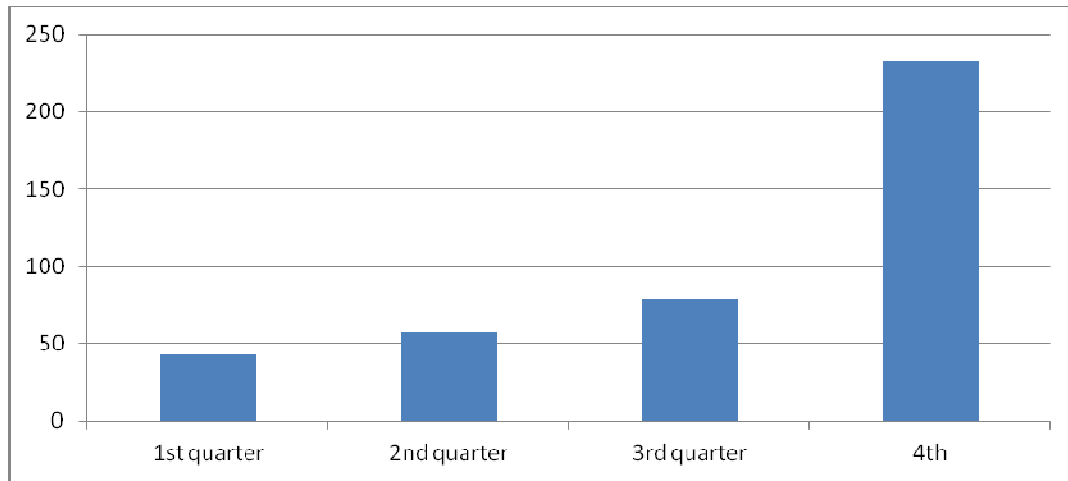


Figure 4. Case distribution per quarter

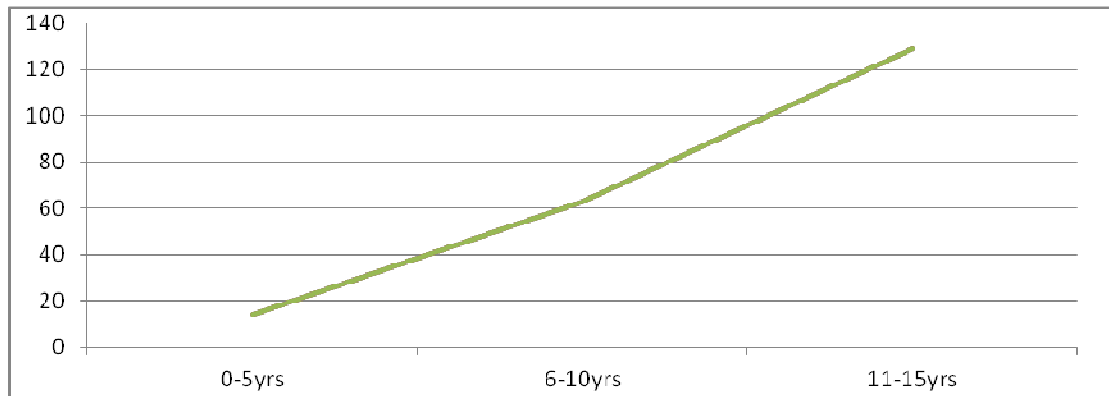


Figure 6. RTA with age

The multiply-injured patients had varying involvement of the various systems of the body in different combinations. A total of 386 of the trauma patients were admitted into the ward, bringing the admission rate in the hospital to 93.7%. Of these number 33(8.5%) were admitted into intensive care unit (ICU).The criteria for ICU admission included the Glasgow coma scale (GCS) and respiratory difficulty. A multidisciplinary approach was necessary in most of the patients requiring the services of paediatric surgeons, plastic, orthopaedic and neuro-surgeons

A total of 312 of the patients had one or more units of blood transfusion giving a transfusion rate of 80%. A total of 74 patients died on admission with a mortality rate of 19%.The major cause of death were injuries to the head and burns.

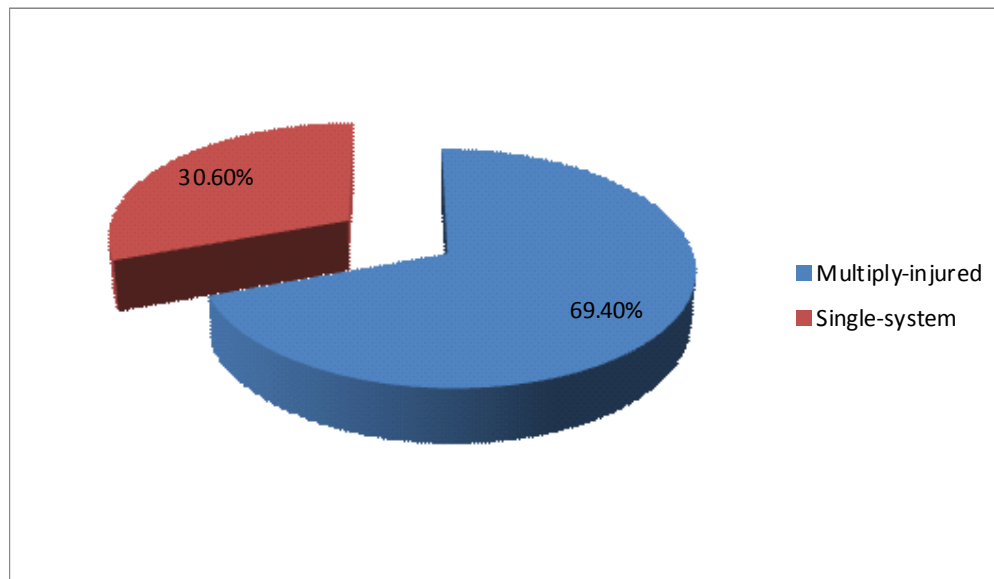


Figure 7. Types of injury

Table 3. Systems involved in injury

System/Region	Number
Head and Neck	63
Thorax	41
Abdomen	229
Skeletal	101
Urogenital	6
Skin	126

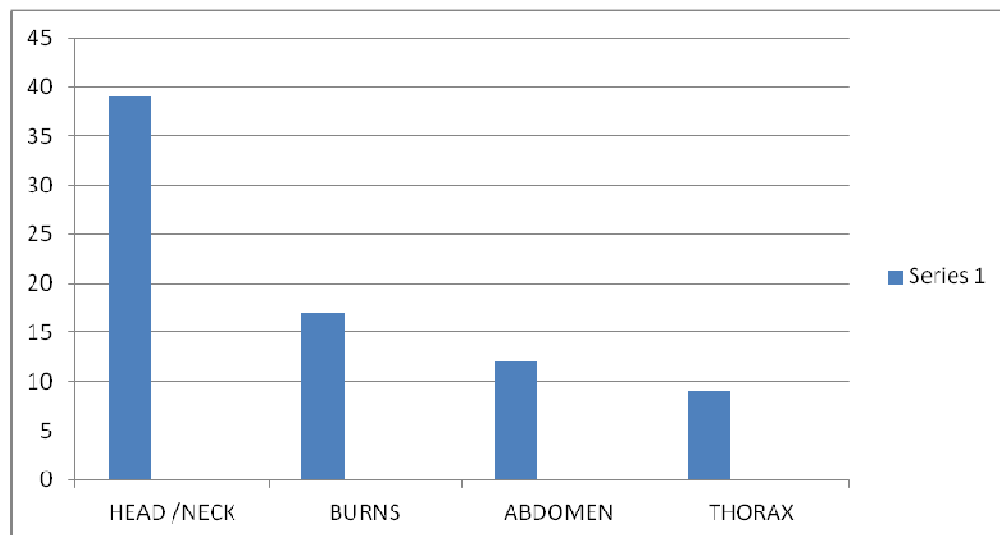


Figure 8. Causes of Death

Discussion

Trauma is reported to be a major cause of childhood morbidity and mortality in developed countries while causing an increasing loss of life in developing countries⁹. It is a cause of loss of precious school days which can impact on the subsequent performance of the child if he manages to survive.

This study showed that males were more involved in trauma cases in a ratio of approximately 6:1. This is possibly because of the adventurous nature of males especially in developing countries where they are most times involved in activities involved in generating funds for their families. The boy-child is therefore brought in contact with factors that can cause trauma to them. This male preponderance is seen in many similar studies^{8,10,11,12}.

RTA accounted for the highest cause of paediatric trauma in this study contributing 50% of the total. With increased motorization of developing communities, poor state of many roads and bad shape of vehicles in addition to bad driving habits RTA would remain a major contributor to paediatric trauma. The boy-child is more at risk of RTA compared to the girl-child as seen in this study; 173(83.9%) in males compared to the 33(16.1%) in females. RTA is reported widely as the commonest cause of paediatric trauma^{3,8}.

In South-Africa and Malawi, fall from height account for the commonest cause of trauma with 43% and 42.9% respectively^{8,13,14}. In this study fall from height contributed 12.8% of the total with the boy-child making up >90% of the cases.

Burns was the second highest cause of trauma making up 29.3%. The Niger-Delta region of Nigeria is home to the crude oil reserve of the country and thus making different forms of petroleum products available to local dwellers. This is more so with the high level of illegal activities of pipeline vandalization and refining. Most of the burns seen were products of explosions from illegal activities and use of adulterated petroleum products. Trauma from contact sports especially football accounted for the lowest causes, (1.6%). All the patients were males. Other causes of paediatric trauma were fights (3.6%) and assaults (2.4%).

The highest number of cases were seen in 2012 with 102(24.8%) and the least in 2013 with 67 (16.2%). This study did not show any particular pattern in terms of yearly case distribution. The 4th quarter of each year recorded the highest incidence of trauma cases. This accounted for 233(56.5%) of cases. This can be attributed to the increased human and vehicular movement and increased commercial activities during this quarter of the year.

A larger number of victims of paediatric trauma were between the ages of 11 and 15 years with 48.1% while children between 0 to 5 years accounted for 15.7% in this study. RTA accounted for most of the cases in the 6-10 year and 11-15 year age groups with 73.2% and 64% respectively. However burns accounted for the highest cause of trauma in the 0-5 year age group with 21.5%. Fall from height cases increased sharply in the 11-15 year age group from the younger ages.

A majority of the patients were multiply-injured accounting for 69.4% while 30.6% had a single region/system injury. These multiply-injured patients had a combination of trauma to various region/system in varying combinations. However 229 cases of abdominal trauma were documented making the abdomen the most commonly injured region in this study. This was followed by the skin (126), bones (101), head and neck (63), thorax (41) and urogenital (6). The urogenital system was the least affected system in this study.

The ward admission rate was 93.7% while the ICU admission rate 8.5%. Most of the patients admitted into ICU were cases of head injury (traumatic brain injury) and patients with respiratory difficulties requiring intubation and mechanical ventilation. The mortality rate in the study was 19%. The major causes of mortality were from injuries to the head and neck (52.1%), burns (23%), thorax (16.2%) and abdomen (6.1%).

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