Childhood Trauma: A Preliminary Study from A Trauma Centre In Northwestern, Nigeria

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Abstract: Background Trauma is a leading cause of morbidity and mortality in children. The incidence has been on the increase. There are few paediatric trauma centres in the country. The aim of this study is to present the incidence, presentation, management and outcome of children involved in trauma in our trauma centre.


A Proforma was designed to record; demographic data, clinical features, evaluation, treatment and outcome. These information was prospectively extracted from patients' medical records, clinical notes and discharged summaries. These data was collated and analysed using SPSS version 17.0.

Results: A total of 2727 patients presented to our trauma centre during the study period. There were 431 (15.8\%) children, 317 boys and 153 girls. The median age was 7 years (range 1 month to 16 years).

The median duration of presentation was 2 hours (range 30 minutes to 7 days). 100 (23.2\%) patients presented between 12 am and 7 pm while 300 (69.6\%) patients were seen between 7 pm and 12 midnight.

At presentation 300 (69.6\%) patients were in pain, 185 (42.9\%) bleeding, 151 (35.0\%) had a swelling of part of the body, 28 (6.5\%) unconscious, 210 (48.7\%) patients had tenderness, 136 (31.6\%) were actively bleeding, 26 (6.0\%) unconsciousness, 24 (5.6\%) burns.

280 (65.0\%) patients were involved in motor vehicle accident, 100 (23.2\%) motorcycle accident, 20 (4.6\%), 20 (4.6\%) fall from height, 24 (5.6\%) burns, 20 (4.6\%) gunshot injuries, and 13 (3.0\%) others. X-rays, ultrasonography, CT-scan, haematological and biochemical parameter were evaluated.

The diagnosis at presentation revealed; 108 (25.1\%) head injury, 183 (42.5\%) lacerations, 4 (0.9\%) chest injuries, 5 (1.2\%) blunt abdominal injuries, 17 (3.9\%) pelvic injuries, 24 (5.6\%) burns, 40 (9.3\%) limb fractures, 12 (2.8\%) polytraumatized patients and others 57 (13.2\%). There were 30 (7.0\%) mortalities. Fifty one (11.8\%) had various morbidities.

Conclusion: The results show good outcome in children managed for trauma in our centre. There may therefore be the need for the establishment of paediatric trauma centres in the various subregions in the country. This will reduce morbidity and mortality in children due to trauma.

Key words: Trauma, accident, morbidity, mortality.

1. Introduction

Trauma is a leading cause of morbidity and mortality in children [1]. It has almost surpassed infectious diseases and malignancy as a major cause of death in children [2]. The burden of trauma is enormous and has created a major health problem globally [3,4]. This trauma problem and burden is even more marked in low income areas like ours and needs to be addressed [5,6].

The current trend is to curb or prevent this menace of trauma [7]. To this end many trauma centres and trauma systems are being developed. These trauma centres are equipped with state of the art facilities to sustain and maintain life. In these centres the advanced life support protocol for resuscitation is the role and has been noted to have a marked influence on outcome [8].

This article therefore aims at establishing the incidence, presentation, management and outcome, of these traumatised children in our trauma centre and the role of the trauma centre in the outcome of management.

2. Patients and Methods

Sokoto is cosmopolitan town in North-western Nigeria. The teaching Hospital takes care of
patients from Sokoto, Zamfara and Kebbi states of Nigeria.

This was a prospective review of children who were involved trauma, presented and were treated in our centre from January 2009 to September 2009. These patients were randomly selected from the population as the consecutively presented to the trauma centre of our hospital.

A structured proforma was designed to record demographic data, clinical features, evaluation, treatment and outcome. These information was prospectively extracted from patients’ medical records, clinical notes, operation notes and discharged summaries. These data was collated, recorded and analysed using SPSS version 17.0. The results were presented using tables and figures.

3. Results

There were a total of 2727 patients including adults and children treated for trauma from various causes during the study period. There were 431 (15.2%) children involved, the rest were adults. There were 317 boys and 153 girls. The age range was 1 month to 16 years, with a median age of 7 years.

The median time of presentation after the accident was 2 hours, with a range of 30 minutes to 7 days. 100 (23.2%) presented between 12am and 7pm, while 300 (69.6%) presented between 7pm and 12 midnight.

At presentation, the symptoms were; pain in 300 (69.6%), Bleeding in 185 (42.9%), Body swelling in 151 (35.0%), Unconsciousness in 28 (6.5%), non specific symptoms (others) 13 (3.0%). Tenderness was found in 210 (48.7%), active bleeding in 136 (31.6%), unconsciousness in 26 (6.0%), burns in 24 (5.6%).

280 (65.0%) patients were involved in motor vehicle accident, 100 (23.2%) motorcycle accident, 20 (4.6%) fall from height, 24 (5.6%) burns, 2 (0.5%) gunshot injuries, and 13 (3.0%) others. X-rays, ultrasonography, CT-scan, haematological and biochemical parameter were evaluated.

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4. Discussion

Trauma has assumed a high dimension as a cause of death in children [1]. In this study 431 (15.2%) were involved in one form of accident or the other. This figure is high, compared to results from developed nations [2].

The accidents were more at the age of 7 years. The reason for is not clearly understood and need to be subjected to further studies. The accidents were commoner in the night. Poor visibility at night might be responsible. Also most vehicles have poor lighting systems which may further compound the visibility problems.

Pain was a cardinal and prominent symptom in the study and should always be addressed during resuscitation. Abdominal pain, chest pain and skeletal pain characterized injuries involving these region. Blunt abdominal is marked in children when compared to penetrating or other injuries [9-13].

Motor vehicle and motor cycle accidents topped the chart of injuries (see table 1). This has been a recurrent problem with several reasons. Some of the reasons are poor roads, poor legislation on the part of riders and drivers, poor vehicle maintenance culture among other things [14].

Lacerations were the major injuries noted in our study (see table 2). These lacerations were followed by head injury and other injuries (see Figures 1, 2, 3, 4). This pattern is different from studies from the developed world where other injuries apart from lacerations were, a major issue [1, 11, 14]. The reason for this pattern in our environment cannot be readily explained. This may have to be subjected for further studies to elucidate the reason.

Abdominal injury of 5 (1.2%) in our study portrayed the fact that this was not major injury in our environment. This is in contrast to other studies in similar environment were abdominal injuries were noted to be significant [14]. There were 4 blunt abdominal and 1 penetrating abdominal injury with evisceration of bowel (see Figure 2). All with blunt abdominal injury were treated none operatively with good outcome. This also conforms to treatment in another study of abdominal injuries in Zaria, Nigeria [14].
The burns injuries recorded in this study were mainly superficial burns. These are associated with less morbidity and mortality and generally good outcome. A study by Fatusi et al showed that the outcome of burns without facial involvement was good [15].

There was no child who was abused in our study. The reason for this is not understood. In studies from developed nations this is one of the reasons that feature [16].

There were also no handle bar injuries noted. This often common in developed societies were children are given the opportunity to ride bicycles [17].

12(2.8%) were polytraumatized (see figure 3). This is often common in children considering their anatomy and physiology when compared to adults [15]. The small size exposes much of their surface area to injury and the nature of their physiology, with lack of reserves when compared to adult’s further compounds the injuries and problems in them.

The complications from head injury such as convulsion, aphasia and hemiparesis occurred as a result of the severity of the injury. Head injury of 23(5.3%) was noted to be comparable with results from similar low income setting [4].

Pelvic and limb fractures left some of the patients with marked deformities and gait abnormalities. Some of them with limb fractures ended with amputations. This occurred in those who had severe injury with vascular compromise and who had their fractures complicated by traditional bone setters, resulting in vascular compromise and therefore amputation as a remedy.

The burns injuries were associated with high wound infection (See Figure 4). The consequence of the infections resulted in healing with ugly scars as noted in some patients.

The mortality was 30(7%) which is good when compared to some the best centres managing emergencies in the industrialized nations [19]. The breakdown of mortality showed; head injury 20(4.6%), polytraumatized 7(1.6%), chest injury 1(0.2%), blunt abdominal injury 1(0.2%), burns 1(0.2%). Polytrauma may designate severe injury and this might explain the reason for the mortality in this group of patients. Chest injury in children conveys a poor prognostic sign. This is because children have little respiratory reserve. This therefore explains the mortality from the chest trauma. The mortality from the blunt abdominal injury was surprising. This is in our centre we have a protocol that monitors them when they are undergoing non operative treatment. In this protocol surgical intervention is employed immediately an indication occurs in the course of non operative treatment. The mortality from burns was quite severe 80%, therefore justifying the reason for the death. The overall mortality of 7% was however good compared to the some centers in the developed countries [19-22].

More importantly this mortality figure was really impressive when compared to mortality from some centres managing trauma in our environment. It is also pertinent to note collaboration with other units and facilities went a long way in improving the management outcome in our study. For example we lack advance support protocol facilities such as ventilators in our trauma centre. So collaborating with anaesthesia enable us to managed critical patients who needed respiratory support and some other intensive facilities. We do not have facilities for fast abdominal sonography for trauma (FAST), and therefore had to use the services of radiology to assess the ultrasonographic findings in abdominal trauma. The other centres in similar settings like ours could employ some of strategies from this study to improve trauma outcomes in their centres. In many developed centres FAST is virtually always available, making fast assessment and evaluation possible [23, 24].

Multidisciplinary measures were employed in our centre. The various experts were contacted when apt and necessary. The various inputs contributed greatly in improving the outcome. So therefore with limited facilities and resources it is still pertinent to manage trauma with good outcome. It does go without saying with high technological facilities needed for trauma, the outcome would have been better.

This impressive mortality result may be attributed to the creation of the trauma centre in our hospital. Our trauma centre is dedicated to trauma only and is equipped with equipment and human resources specialized in trauma.

In our study the type of injury and the severity of injury amongst other features like poly trauma were amongst the predictors of mortality. In it under
stood that in childhood the predictors of mortality are more prevalent, making mortality high [25]. The major poor prognostic factors noted were Polytrauma, severe head injury and severe chest trauma.

The morbidity of 51(11.8%) noted in the study was good with little or no patients that needed rehabilitation there afterwards. The morbidity from some other centres has been noted to be huge, sometimes incapacitating the children involved (see table 3).

The good outcome in our centre might have been due creation of a trauma centre, with facilities for trauma care.

Trauma outcome studies are few in our environment and involve mainly blunt abdominal trauma [9, 14]. This is not from developed centres where trauma outcomes are available for the abdomen and other injuries [11, 21]. In a study from Ghana, it was found out that mortality from trauma was 36%, while comparing with results from a trauma centre in USA, where the mortality was 6% [26]. This figure gives a 6 times higher chances of mortality in a Ghanian hospital when compared to an American trauma centre.

In conclusion, trauma is common in children in our environment. The outcome of their treatment is good. Therefore we advocate that paediatric trauma centres be established in the various subregions to handle this group of vulnerable patients. They do not have to wait for high technological facilities to set up a trauma centre. This may reduce morbidity and mortality in children from trauma.

5. References


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<tr>
<th>Mechanism of injury</th>
<th>Frequency</th>
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<tbody>
<tr>
<td>Motor vehicle accident(MVA)</td>
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<td>Motor cycle accident(MCA)</td>
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<td>Others</td>
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<td>4</td>
<td>Burns</td>
<td>13</td>
<td>Wound infection 10 Ugly scar 3</td>
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</table>
Figure 1: Head injury with scalp lacerations.

Figure 2: Penetrating abdominal injury with evisceration of bowel.

Figure 3: Polytraumatised with head injury and left femoral fracture.

Figure 4: Burns involving the head, face, upper limbs and the upper trunk.