Original Article
African Journal of Paediatric Surgery
Vol. 4 (1); Jan - Jun 2007

A 5-year Prospective study on Chest Trauma in Children

Misauno, M.A.; Nwadiaro, H.C.
Department of Surgery, Jos University Teaching Hospital, Jos Plateau State, Nigeria.

Abstract

Background: Chest trauma is an important cause of mortality in children worldwide. In this study we present our experience with childhood chest trauma within a five years period.

Patients and Methods: This was a 5-year prospective study of consecutive patients with chest trauma. Data entered into a pre-planned proforma included demographic information, type of injury, mechanism of injury, associated injuries, type of treatment given, outcome of management and duration of hospital stay.

Results: There were 36 children aged between 2 and 16 years (mean age: of= 10.5 ± 6.2 years). There were 24 males and 12 females (m:f 2:1). Twenty seven (75%) of the 36 patients had blunt trauma while nine (25%) had penetrating chest injury. Road traffic accident was responsible for chest trauma in 26 (72.2%) children, but 6 (16.7%) other children were victims of civil unrest while 4 (11.1%) fell from heights. Haemo-pneumothorax was common in 10 (27.8%) patients. Twenty five out of the 36 (69.4%) patients had associated injuries, 10 (40%) were head injuries, followed closely by abdominal injury in 8 (32%).

Conclusion: Chest trauma in children is common in our environment. Majority of the children suffered blunt trauma following road traffic accidents. Prompt recognition and treatment of affected children is needful for a successful outcome.

Key word: Chest trauma, Children, Road Traffic Accident.

Introduction

Chest trauma is an important cause of trauma mortality worldwide with an estimated death toll of 20,000 children annually in the United States of America[1]. Isolated chest trauma carries 4 to12% mortality[2-4]. This increases to 20% and 35% when there is associated abdominal trauma and head injury[3-5].

Although chest injury is uncommon and infrequently reported in children, it poses great management challenges to the surgeon[6-11]. This study aims to evaluate the pattern and management outcome of paediatric chest trauma in a non-paediatric cardiothoracic trauma centre in a developing country.

Patients and Methods

Correspondence: Dr Misauno M.A, Department of Surgery, Jos University Teaching Hospital, P.M.B 2076, Plateau State Nigeria. E- mail:micoyedim@yahoo.co.uk.

This was a prospective study of consecutive patients aged between one day and 16 years presenting at the accident and emergency department of the Jos University Teaching Hospital over a 5 year period from January 2000 to December 2004.

Patients were further evaluated and treated on the wards until discharge. Patients were adjudged fit for discharge when the presenting symptoms like pain and breathlessness, absence of septic or other complications had disappeared, and there was general improvement in the patients clinical state. Patients were followed up for a period of three months after discharge at the surgical out patient clinic.

Data entered into a pre-planned proforma included demographic information, type of injury, mechanism of injury, associated injuries, type of treatment given, outcome of management and duration of hospital stay. Data obtained was analysed

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for simple means and percentages using the epi-info statistical computer software version 3.2.2 (2004)

Results

There were a total of 182 cases of chest trauma during the study period, 36 (19.8%) of which occurred in children aged between 2 and 16 years (mean age: of=10.5 ± 6.2 years).There were 24 males and 12 females (m:f = 2:1). Twenty seven (75%) of the 36 patients had blunt trauma while nine (25%) had penetrating chest injury. Road traffic accident was responsible for chest trauma in 26 (72.2%) children, but 6 (16.7%) other children were victims of civil unrest while 4 (11.1%) fell from heights.

The most common pattern of presentation was haemo-pneumothorax in 10 (27.8%) patients (Table 1). Twenty five out of the 36 (69.4%) patients had associated injuries; head injury was the most common associated injury noted in 10 (40%) children followed closely by abdominal injury in 8 (32%) , (Table 2).

Majority of the patients in this study were managed conservatively with only one patient requiring open thoracotomy (table 3).

There were two mortalities, resulting from flail chest and thoraco-abdominal injury; all due to blunt trauma.

Table 1: Pattern of Paediatric Chest Trauma

Injury Type	No of Patients	Percentage (%)
Haemo-pneumothorax	10	27.8
Thoraco-abdominal injury	9	25
Haemothorax	6	16.6
Lung Contusion	6	16.6
Clavicular Fracture	3	8.3
Flail Chest	1	2.8
Total	34	100

Table 2: Associated Injuries

Associated Injuries	No of Patients	Percentage (%)
Head Injury	10	40
Abdominal Injury	8	32
Soft Tissue Injury	4	16
Long Bone Fractures	3	12
Total	25	100

Table 3: Treatment

Type of Treatment	No of Patients	Percentage (%)
Observation	19	52.8
Thoracostomy	12	33.3
Thoracostomy + Laparotomy	4	11.1
Thoracotomy	1	2.8
Total	36	100

Discussion

Blunt trauma from road traffic accident accounted for three-quarters of chest trauma in this study cutting across all ages. Pedestrian injuries caused by vehicular accidents tended to be more common in the pre-school and school age groups. Hawking of goods by these children is another important predisposition to road traffic accident and chest trauma. This finding agrees with that of Abdulaziz Al- Saigh et al[2] in a review of 74 children with chest trauma where blunt chest trauma accounted for 80% of the cases.

Penetrating injury, though considered an adult affair[12,13], had a high incidence in this study probably due to the two major violent communal conflicts that occurred during the period of the study. Majority (69.4%) of the children had other associated injuries, mostly head injury[2,3]. This is not surprising because the younger children have a relatively large head compared with their body size.

Rib fractures were not a common event in this study, although haemothorax frequently. This is so because of the compliant nature of the chest wall in these children. Traumatic rib fractures in children do not occur commonly because of the compliant nature of their chest wall; when it occurs, a severe injury is indicated.

Two mortalities were recorded in this study giving

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a mortality rate of 5.5%. this compares well with the study of Abdulaziz Al- Saigh et al who documented a mortality rate of 5.7% the relatively low mortality may be attributed to the high index of suspicion of chest injury in this patients and the prompt intervention.

In conclusion, chest trauma in children is common

Une étude prospective de 5 années portant sur le traumatisme de la poitrine chez les enfants

Résumé

Arrière-plan: Le traumatisme de la poitrine est mondialement une cause importante de mortalité chez les enfants. Dans cette étude nous présentons notre expérience du traumatisme de la poitrine de l'enfance pendant une période de cinq ans. ***Malades et méthodes:*** Il s'agit d'une étude prospective de 5 ans portant sur des malades consécutifs atteints du traumatisme de la poitrine. Les données entrées dans un pro forma pré-organisé comprenaient de l'information démographique, le type de blessure, le mécanisme de la blessure, les blessures connexes, le type de traitement donné, le résultat de la gestion et la durée du séjour à l'hôpital. ***Résultats:*** Il y avait 36 enfants âgés de 2 à 16 ans (âge moyen = 10,5 ± 6,2 ans). Il y avait 24 garçons et 12 filles, ce qui donne un taux mâle/femelle: (m:f) de 2 à 1. Vingt-sept (75%) des 36 malades étaient atteints d'un traumatisme direct, alors que neuf (25%) avaient une blessure pénétrante à la poitrine. Des accidents de la circulation étaient à l'origine du traumatisme de la poitrine chez 26 (72,2%) des enfants, mais six des enfants (16,7%) étaient victimes de troubles civils, alors que quatre enfants (11,1%) étaient tombés de haut. L'hémo-pneumothorax était répandu chez 10 malades (27,8%). Vingt-cinq des trente-six (69,4%) malades avaient des blessures connexes, 10 enfants (40%) avaient des blessures à la tête, alors que 8 autres (32%) avaient des blessures abdominales connexes. ***Conclusion:*** Le traumatisme de la poitrine chez les enfants est fréquent dans notre environnement. La majorité des enfants ont souffert un traumatisme direct suite à des accidents de la circulation. L'identification et le traitement ponctuels des enfants affectés sont nécessaires pour un bon résultat. ***Mots-clés:*** Traumatisme de la poitrine, enfants, accident de la circulation.

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