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Epidemiology and management of head injury in paediatric age group in North-Eastern Nigeria

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ABSTRACT

Background: Paediatric head injury (HI) is the single most common cause of death and permanent disability in children world over, and this is increasingly becoming worrisome in our society because of increased risks and proneness to road traffic accidents on our highways and streets. The study set to determine causes and management of HI among children in our society. **Patients and Methods:** A retrospective review of all children aged 0-15 years with traumatic head injury (THIs) who were managed at the University of Maiduguri Teaching Hospital between July, 2006 and August, 2008. **Results:** A total of 45 children with THIs presented to the casualty unit of the hospital; 30 (66.7%) were boys and 15 (33.3%) were girls. Three (6.7%) children were less than 1 year of age, 21 (46.7%) were between 1 years and 6 years while 16 (35.6%) and 5 (11.0%) were aged 7-11 years and 12-15 years respectively. Thirty six (80.0%) of the children were pedestrians, 6 (13.4%) fell from a height, while 2 (4.4%) and 1 (2.2% were as a result of home accident and assault, respectively. Twenty one patients (46.7%) had mild HI, while 53.3% had moderate to severe category. Forty one (91.1%) of children were managed as in-patients, mostly (95.1%) by conservative non-operative management, while 4 (8.9%) were treated on the out-patient basis. The mortality rate was 17.8%. **Conclusion:** H1 among children is of a great concern, because of its incremental magnitude, due to increasing child labour and interstate religious discipleship among children, with attendant high mortality and permanent disabilities. Necessary laws and legislations should be formulated and implemented with organized campaigns and public enlightenment to prevent and mitigate this menace.

Key words: Head injury, Nigeria, paediatric

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INTRODUCTION

The paediatric head is more susceptible to trauma from external forces because of its relatively lager surface area relative to the body. Studies reported that the outcome of head injury (HI) is better in children than in adults,[1,2] presumably due to the inherent plasticity of the cranium and its contents in children, and the ability of their brain to rewire itself.[1,3] The present economic downtown in our setting with its attendant struggle for survival has led to child labour and street begging, so that these children are unduly exposed to the risks of accidents from reckless motorists, resulting in exponentially increased paediatric traumatic head injury (THI).[4] This study reports our experience with the management of childhood HIs.

PATIENTS AND METHODS

This was a retrospective analysis of 45 children aged 15 years or less who were managed non-operatively for acute THI over a 2 year period, at the University of Maiduguri Teaching Hospital, Nigeria. This centre is the main referral centre, sub-serving the North-Eastern part of Nigeria and the neighbouring Chad and Cameroun Republics.

Using a structured Proforma, data extracted from cases files were analysed for biodata, cause of HI, duration before presentation, first aid given, the post resuscitation glasgow coma scale (GCS), nature and severely of THI, indications for admission, associated

injuries, investigations carried out, patient outcome and THI sequelae, using SPSS version II.

RESULT

There were 45 children, 30 (66.7%) were boys and 15 (33.3%) were girls. Three children (6.7%) were aged less than 1 year, 21 (46.7%) were between 1 years and 6 years while 16 (35.6%) and 5 (11.0%) were aged 7-11 years and 12-15 years respectively. Thirty six (80.0%) of the children were pedestrians, 6 (13.4%) fell from a height while 2 (4.4%) and 1 (2.2% were as a result of home accident and assault, respectively. Based on GCS,[5] THI was mild in 21 (46.7%) patients (GCS 13-15), moderate in 8 (17.8%) patients (GCS 9-12), and severe in 16 (35.6%) patients (GCS <8). Forty-one (91.1%) of the patients required admission, only 4 (8.9%) who sustained only scalp lacerations were treated on an out-patient basis. Of the 41 (91.1%) inpatients, loss of consciousness and convulsions were responsible for 60% of the admissions. Other indications are as listed in Table 1.

Table 1: Indications for admission among HI children in Maiduguri

Indications	Frequency (%)
Loss of consciousness	19 (42.2)
Convulsion	8 (17.8)
Severe HI	3 (6.7)
Confusion	2 (4.4)
Associated injuries	3 (6.6)
Open skull fracture	1 (2.2)
Hemiplegia	1 (2.2)
Moderate HI	1 (2.2)
Severe headache	2 (4.4)

HI: Head injury

Table 2: Distribution of cases by aetiology

Aetiology	Frequency (%)
Pedestrian	36 (80)
Vehicular	32 (71.1)
Motorbike	4 (8.9)
Fall	6 (13.4)
Home accident (wall colapse)	2 (4.4)
Assualt	1 (2.2)

Associated injuries occurred in 18 (40%) patients. These included fractured clavicles in 6 (13.3%) cases, long bones in 7 (15.6%), facial lacerations in 4 (8.9%); others were frictional burns and a scalp avulsion (which necessitated rotational scalp cover), spinal, abdominal and chest injuries.

The management of these patients involved suturing scalp lacerations and THI advice for the out-patients, admission for observations, vital signs and neurological monitoring for the mild. Patient with moderate and severe THI were initially resuscitated with oropharyngeal suctioning, oxygen by face mask, restricted intravenous fluid therapy, antibiotics, anti-oedema measures, anti-epileptics and nasogastric feeding as indicated. Two patients were managed operatively, one had craniotomy to evacuate extradural haematoma and the other had scalp flap raised to cover an exposed brain matter by the plastic and reconstructive unit. Mortality occurred in 8 patients (17.8%), all among the severe HIs.

DISCUSSION

Minor trauma to the head is common in childhood and does not require any medical or surgical treatment.[5] Nevertheless, THI in infancy and childhood is the single most common cause of death and permanent disability world over.[6] Pedestrian vehicular accident has remained the commonest cause of TH1 in the paediatric age group [Table 2]. In this series, most of the patients (82.3%) were between the ages, 1-6 years and 7-11 years [Figure 1]. This collaborates with the reports of others.[3,8-11] In our setting, street trading, hawking of wares, begging as well as errand running by children are common practices, especially among the less privileged. This exposes to traffic risks, coupled with the reckless driving by unlicensed motorists and commercial motorcyclists, makes the children accident proned on our streets and roads. These could possibly explain the high incidence of THI witnessed among the age bracket who are outgoing and active and errand- suitable age group.

Unexpectedly, in this series the children of Hausa extracts, which is one of the immigrant tribes in Maiduguri are the most effected, 14 patients (37.2%), [Figure 2], ahead of the children of indigenous Kanuri people, 13 patients (28.9%).This could be attributed to notable practice of the Hausas, who send out their children at their prime, formative ages to neighbouring states for religious discipleship, popularly called the Almajiris. Although religious discipleship is a desirable practice and must be encouraged ,but should not be done at the deteriment of children that still reguire parental nursing and guidance.

TH1 were classified into mild, moderate and severe according to the post resuscitation Glasgow coma

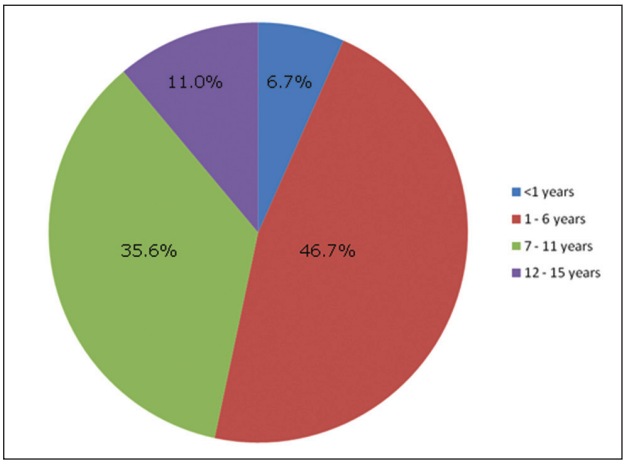


Figure 1: Distribution of cases of THI by age

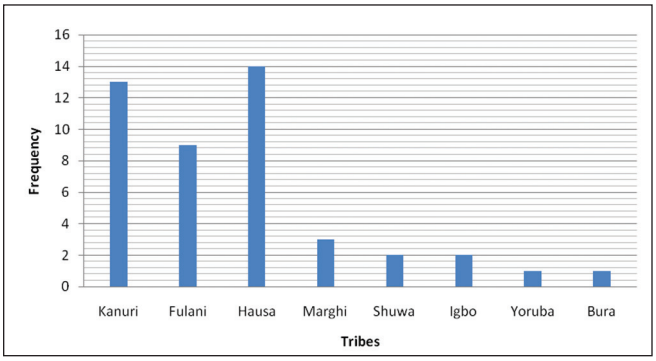


Figure 2: Magnitude of head injury among children of different tribes in Maiduguri

scale (GCS) as follows, 13-15 mild, 9-12, moderate and 3-8 severe.[7] This provides an accurate measure of the child's neurological status and so a reliable predictor of outcome in childhood TH1 managed conservatively and is also easily reproducible among trained and untrained personnels.[1] 53.4% of cases of THI in this series had moderate to severe THI and all were admitted.Only 4 of the mild cases of THI who had sutured scalp lacerations were managed on outpatient care bases.The remaining 17 cases were admitted either because of low level of the sensorium or associated injuries.

Among the 41 (91.1%) admitted patients, loss of consciousness and convulsions were responsible for 60% of the indications for admission [Table 1].

Associated injuries occurred in 18 patients (40%) in this series. These were mainly skeletal fractures, clavicles, 6 cases, (13.3%) and long bones, 7 cases, (15.6%), facial lacerations, 4 cases, (8.9%), frictional burns, 2.2.% and a scalp and skull avulsion which necessitated rotational scalp cover. Other reported associated injuries[3], included, spinal abdominal and chest injuries 2.6%, 1.1% and 0.7% respectively.

The management of these patients involved suturing scalp lacerations and HI advice for the out patients, vital signs and neurological monitoring for the mildly injured. Patient with moderate and severe HI were initially resuscitation with oropharyngeal suctioning, oxygen by face mask, restricted intravenous fluid therapy, antibiotics, anti-oedema measures, anti-epileptics and nasogastric feeding as indicated. There were only 2 cases that were managed operatively. One of the them had craniotomy to evacuate extradural haematoma and the other had scalp flap raised to cover an exposed brain matter by the plastic and reconstructive unit.

In this study, an admission GCS of eight or less was associated with the highest mortality and morbidity rates, with 100% of the deaths occurring in patients with GCS in this range. Another measure of outcome, which was not employed in this study is Glasgow outcome scoring.[12] This is a better index of outcome, but could not be applied because of poor follow-up.

CONCLUSION

TH1 among children is of a great concern because of its incremental magnitude, high mortality and permanent disability. This can be mitigated by stringent laws and legislations limiting reckless driving by motorists and cyclists. Furthermore, organized campaigns and education of the populace to prevent undue exposure of children to such hazards as street begging, and hawking by children should be discouraged and outlawed.

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