

Original Article

Head Injury in Paediatric Population

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ABSTRACT

Objective: To study the presentation and outcome of head injury in paediatric patients managed in Children Hospital & The institute of Child Health, Multan.

Study Design: Retrospective Descriptive Study.

Place & Duration of Study: This study was conducted in the Deptt. of Paed. Surgery, CH&ICH, Multan, during a period of five years from Jan 2006 to Dec 2010.

Patients and Methods: A total of 1150 paediatric patients with head injury were managed in this unit. Data was collected on the basis of history, clinical examination, base line investigations, radiological findings including CT scan, diagnosis and management. Patients were divided into three groups according to the severity of injury based upon Glasgow Coma Scale (GCS). Final analysis and comparison with literature was done.

Results: Seventy percent patients were male and 30% female. The age ranged from 1 week to 12 years. Commonest cause was history of fall from height found in 68% cases, followed by road traffic accident 25% and other causes 7%. 70 patients had associated injuries, 5 patients were already mentally handicapped. In 75% cases mild head injury with GCS 14-15 was present. 35 patients required neurosurgical intervention. 15 patients required treatment for post traumatic seizures. 3 developed brain abscess. 15 patients died in the emergency ward without any surgical intervention within 2 days of admission and 2 died post operatively.

Conclusion: Head injury remained a serious problem in paediatric age group with significant morbidity & mortality. Recognizing the pattern of head trauma in children help us to identify high risk groups and environment, which will then help us to design appropriate preventive measures.

Key words: Head Injury, CT Head, Glasgow Coma Scale (GCS)

INTRODUCTION

Head Injury is a leading cause of morbidity and mortality in children world wide¹ and in Pakistan as well². One fourth of population comprises of children under 12 years². Measureable deficit occurs even after mild to moderate head injury but it could be much more after severe head injury. These problems are impaired cognition, motor impairments, disruption of attention and information processing and psychiatric disturbance¹. Fall from height is the most common cause of injuries visiting emergency department and fourth leading cause of trauma related deaths, followed by motor vehicle accidents, fires and drowning³⁻⁶. Mostly patients suffer from minor brain injury^{6,8,10,11}. Over all, fall accounted for 5.9% of childhood deaths⁷. The present study was done to identify the frequency of head injury among paediatric age groups, assess magnitude of the problem and define meaningful preventive strategies to reduce this major public health issue in our setup.

PATIENTS AND METHODS

The study was carried out in the Department of Paediatric Surgery, Children's Hospital & The Institute of Child Health, Multan from Jan 2006 to Dec 2010. All patients up to 12 years of age with history of head

trauma were included. Patients were first seen in emergency department. Initial resuscitation and assessment was made on the basis of history, clinical examination and necessary radiological investigation. Patients were treated according to standard trauma protocol. The initial post resuscitation GCS was used in the assessment of head trauma. According to GCS, head injury is classified as mild with GCS 14-15, moderate with GCS 9-13 and severe with GCS ≤ 8 ⁶. For patients less than 4 years of age, modified Glasgow Coma Score was used in which best verbal response is modified.

RESULTS

A total of 1150 patients were managed during this period. 70% were male and 30% were female. The age ranged from 1 week to 12 years. Commonest cause of head injury remained fall from height (68%) followed by road traffic accidents (25%) and other causes (7%). There was only one patient of proven child abuse. CT scan of head was performed in 527 patients in which GCS deteriorated or symptoms persisted.

70 patients had associated injuries including fracture of limb, fracture of spine and abdominal injuries. In 75% cases there was mild head injury while 16% patients had moderate head injury and 9% patients were with severe head injury. Most of patients admitted in the hospital for 24 hours observation. 35 patients underwent some surgical procedure, 18 patients had

elevation of depressed fracture, 9 patients had craniotomy for extradural hematoma, 6 patients underwent craniotomy for subdural hematoma. Nine patients with severe head injury died within 5 days of admission, 4 patients died post operatively. 15 patients were treated for post traumatic seizures and 3 for brain abscess.

Table No.1: CT finding in a total of 527 patients

Normal	321	60.91%
Brain Edema	36	6.3%
Contusion/ Laceration	11	2.03%
Hematoma	25	4.74%
Skull Fractures		
Linear	116	22%
Depressed	18	3.4%

DISCUSSION

There are definite physiological differences between paediatric and adult brain which have direct effect on management and outcome of head trauma. In new born with open fontanels, normal intracranial pressure is upto 2cm of water. In young children it is 3-6 cm of water. In contrast, the upper level of reference range in adults is 15 cm of water. Brain water content is 90% in children and 75% in adolescents. Myelination is absent at birth and slowly increases until adolescence. Cerebral blood flow is 10% less than that of an adult until the age of 3-4 years and reaches adult level in adolescence. Children with head injury usually present with normal blood pressure and tachycardia. Bradycardia in a child with head injury usually indicates increased intracranial pressure. For reasons not fully understood, children survive higher and more prolonged intracranial pressure. Children have lower chance of surgical lesion as compared to adult head injury patients. As a result children are far better than adults with head injury^{8,11}. Concussion which is minor brain injury is also reported to be more common^{4-6,11}.

Majority of patients in this study presented with mild head injury who survived on conservative treatment. Most of the patients were in 6-11 years of age group. Accidental injuries and child abuse were less common as compared to western world, where at least 10% of children less than 10 years of age were brought to emergency department with alleged accidents and victims of child abuse⁹. Sports related head injury is similarly mentioned in international literatures¹¹.

More than 75% of head injuries in paediatric age group are preventable. This shows the gravity of this major problem, issue and inadequacy of the preventive measures taken. Majority of our patients presented with history of fall from the roof while flying kites and playing unsupervised on the roof top without safety railings as compared to western world where road

traffic accident is common^{6, 8}. Literacy among the mothers appears to be directly linked with provision of safety measures for children at home. In this study illiterate mother and poor families had more than 5 children and were relatively more ignorant of the safety of their children. Parents should supervise their children when they are playing inside or outside the homes. Parents and teachers should teach and train children about the precautions and proper methods to cross the streets and roads¹⁰. The safety measure if practiced within home and outside can avoid these catastrophic mishaps.

CONCLUSION

Head trauma or craniocerebral injury remained a common problem in the paediatric age group with significant morbidity and mortality. The commonest cause of head injury was fall from height and commonest type of brain injury was concussion. Most of the injuries are preventable by education of children and their parents.

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