

HEAD INJURY IN PAEDIATRIC AGE GROUP:

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ABSTRACT

Objective To document and analyze the presentation and outcome of head injury in paediatric age group in tertiary care hospital.

Study design Descriptive study.

Place & Duration of study Department of Neurosurgery, Foundation University Medical College, Rawalpindi, from June 2003 to May 2008.

Methodology Retrospective review was conducted over 5 years period. All paediatrics patients with head injury managed in the unit were enrolled in the study. Data collected on history, physical examination findings, base line investigations, radiological findings and diagnosis. Patients were divided into three groups according to the severity of the injury based upon Glasgow coma score (GCS).

Results In a five year period 1245 paediatric patients with head injury were managed. There were 76% (n= 946) males and 24% (n=299) females. The age ranged from 2 weeks to 12 years. History of fall from height was the commonest cause of head injury found in 65% (n=747) cases, followed by road traffic accident (RTA) 22% (n =274) and other causes 13 % (n=224). Sixty seven patients had associated injuries. In 79% (n=983) cases mild head injury with GCS 14-15 was present. Forty six patients underwent neurosurgical procedures. Eleven patients with severe head injury died within 5 days of admission. Three patients died postoperatively.

Conclusions Head injury in paediatric age group carries substantial morbidity and mortality. Recognizing the pattern of head trauma in children in Pakistan helps to identify high risk groups and environment, which will than help us to design more appropriate preventive measures.

Key words Head injury, Pediatric, Mortality, Glasgow coma scale.

INTRODUCTION:

Head injury in paediatric age group is a leading cause of morbidity and mortality in children in Pakistan. Pakistan is 6th most populous country in the world with current estimate of 185 million people.¹ 35.6% of our population comprise of children from 0-12 years.² Nation wide head injury data in paediatric

age group is not available in Pakistan. In United Kingdom, head injury in infancy and childhood is the single most common cause of death and permanent disability.⁵ Measurable deficits occur even after mild to moderate head injury but are markedly greater after severe injury. They include impaired cognition, motor impairments, disruption of attention and information processing, and psychiatric disturbances.⁶ Considering all paediatric trauma, falls account for the most common reason for an emergency department visit and are the fourth leading cause of trauma-related death, ranking behind motor vehicle accidents, fires, and drowning.⁷⁻¹⁰ Overall, falls accounted for 5.9% of childhood deaths.¹¹

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The present study was undertaken to evaluate the frequency of head injury among paediatric age group, assess magnitude of the problem and collect actionable evidence base for evolving meaningful preventive strategies to address this major public health issue in Pakistan.

METHODOLOGY:

The study was carried out in the Department of Neurosurgery, Foundation University Medical College, Rawalpindi from June 2003 to May 2008. All patients less than 12 years of age with history of head trauma were included. Patients were first seen in accident and emergency (A/E) department. Initial assessment was made on the basis of history, physical examination and necessary radiological investigations. Patients received standard trauma protocol. The initial post resuscitation Glasgow coma score (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 < 8.¹⁰ For patients less than 4 years old modified Glasgow coma score was used in which best verbal response is modified. All moderate and severe head injury patients were admitted in Intensive Care Unit. National Institute of Clinical Excellence (NICE) guidelines were followed in triage, assessment and early management of head injury.¹¹

RESULTS:

A total of 1245 patients were managed during the study period. Seventy six percent (n=946) were males and 24% (n=299) females. The age ranged from 2 weeks to 12 years. History of fall from height constituted the commonest cause of head injury in this study (n=747, 65%) followed by road traffic accident (n =274, 22%) and other causes (n=224, 13%). There were only two cases of proven child abuse. Sixty seven patients had associated injuries including abdominal, limbs and spine injuries.

In 79 % (n=983) cases there was mild head injury while 13% (n=162) had moderate head injury and 8% (n=99) patients were with severe head injury. Most of the patients (n=1045, 84%) admitted in the hospital for observation for 24 hours or overnight. Forty six patients underwent neurosurgical procedures. Eleven patients had elevation of depressed fracture, nine patients had craniotomy for extradural haematoma, four patients underwent craniotomy for subdural haematoma. One patient presented with exterior herniation of the part of right frontal lobe due to handle of the motor bike driven into the frontal region of the skull. He underwent wound debridement and excision of the herniated

part of the right frontal lobe and cranioplasty. Eleven patients with severe head injury died within 5 days of admission. Three patients died postoperatively. Twenty seven patients were treated for post-traumatic seizures for a maximum period of six months.

DISCUSSION:

There are definite physiological differences between paediatric and adult brain which has direct effect on management and outcome of head trauma. In newborns with open fontanelles, normal intracranial pressure (ICP) is between 1.5-6 mm Hg. In young children, it is 3-5 mm Hg. In contrast, the upper level of the reference range in adults is 15 mm Hg. 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 less than 50% that of an adult until age 3-4 years and reaches adult levels in adolescence. Children with head injury usually present with normal blood pressure and tachycardia. Bradycardia in a child with head injury usually indicates increase in intracranial pressure. For reasons not fully understood, children survive higher and more prolonged intracranial pressure values. Posttraumatic seizures are more likely to occur within the 1st 24 hours in children than in adults. Children have lower chance of having a surgical lesion compared to adult head injury patients. As a group children fare better than adults with head injury.¹²

Majority of the patients in this study presented with mild head injury who survived on conservative treatment. Bulk of our patients was in 7-12 years age group. Non accidental injuries or child abuse cases were rare in the population studied compared to western world, where at least 10% of children < 10 years of age brought to emergency department with alleged accidents, are victims of child abuse.¹³

More than 75 % of head injuries in paediatric age group are preventable as borne out by this study. This highlights the gravity of this major public health issue and inadequacy of the preventive measures taken. Majority of our patients presented with history of fall from the roof while flying kites or playing unsupervised on the roof top having no safety railings. Literacy among the mothers appears to be directly linked with the 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 and outside homes. Parents and teachers should teach and train children the precautions and proper methods to cross the street and roads. The safety measures if practiced within home and outside, can avoid catastrophic accidents.

CONCLUSIONS:

Head injury or cranio-cerebral trauma remained a common problem in paediatric age group with significant morbidity and mortality. The commonest cause of head injury was fall from height. Most of the children presented with mild head injury.

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