Research Article

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Factors affecting head trauma in children

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ABSTRACT

Background: To study the epidemiological factors of head trauma in paediatric patients at a tertiary care centre. **Methods:** 60 consecutive admitted patients of head trauma were studied and analysed as per set proforma. The study included details pertaining to time since injury, average duration of stay, age distribution, sex distribution, GCS at presentation, mode of injury, associated injuries, CT findings, type of management and outcome. The results were tabulated and analysed.

Results: The average time of presentation since injury was 3 hours, average duration of stay was 4 days, 1-5 years was the most commonly affected age group. GCS at presentation was 15 in most cases, fall from height was the most common mode of injury, Contused lacerated wounds were the commonest external injuries, parietal bone fracture was the most common CT scan finding, 96% improved with conservative management.

Conclusions: Head injury occurs commonly in preschool children due to fall from unprotected roof tops. The prognosis in majority of the cases is excellent.

Keywords: Head injury, Children

INTRODUCTION

Trauma is the second most common cause of mortality and morbidity in children. The exact incidence of paediatric head trauma in India is not known, though there are certain studies which have reported an incidence as high as 50% of all cases of trauma in children. Review of literature on paediatric head injury reveals that there are very few studies which have studied the epidemiological factors and incidence in India as well as in other developing nations. The aim of this study was to study the epidemiological factors in children with head trauma admitted in a tertiary care centre in western India.

METHODS

This study was conducted in the Department of Paediatric Surgery, Nair hospital, Mumbai, India. It includes 60

consecutive patients of head trauma admitted over a period of one year from September 2012 to August 2013.

The inclusion criteria for the study were as follows:

- 1. Children below 12 years of age
- 2. Neonates were also included
- 3. Head injury requiring admission

The exclusion criteria for the study were as follows:

- 1. Children above 12 years of age
- 2. Head injury managed on Outpatient basis
- 3. Head injury associated with polytrauma

On admission all the patients were assessed according to Paediatric Glasgow coma scale and were managed according to set protocol. A reference to neurosurgery was sent in all cases and treatment modified accordingly. Patients requiring neurosurgery were transferred to Neurosurgery and the rest were managed in the Department of Paediatric Surgery. Anticonvulsant prophylaxis was not given in all the cases, but was started in certain cases after consultation with neurosurgery. Pain management was achieved with basic NSAID's. The criteria for CT scan was followed as per NICE guidelines as follows, for children who have sustained a head injury and have any of the following risk factors, CT scan was performed within 1 hour of the admission.²

- 1. Suspicion of non accidental injury
- 2. Post traumatic seizure but no history of epilepsy
- 3. On initial emergency department assessment , GCS < 14, or in children < 12 months GCS < 15
- Suspected open or depressed skull fractures or tense fontanelles
- 5. Any sign of basal skull fracture (hemotympanum, Panda eyes, CSF leakage from the ear or nose, Battle's sign)
- 6. Focal neurological deficit
- 7. For children under 1 year, presence of bruise, swelling or laceration on the head.
- 8. Loss of consciousness >5 minutes

- 9. Abnormal drowsiness
- 10. Three or more discrete episodes of vomiting
- 11. Dangerous mechanism of injury
- 12. Amnesia (antegrade or retrograde)

X Rays were done to rule out cervical spine and other bony injuries, and baseline hematological work up was done.

The data collected was subjected to analysis in terms of following factors

- 1. Time since injury
- 2. Average duration of stay
- 3. Age distribution
- 4. Sex distribution
- 5. GCS at presentation
- 6. Mode of injury
- 7. Associated injuries
- 8. CT findings
- 9. Type of management and outcome.

The results were tabulated and analysed.

	1	2	3	4	5	6
Eyes	Does not open eyes	Opens eyes in response to painful stimuli	Opens eyes in response to speech	Opens eyes spontaneously	N/A	N/A
Verbal	No verbal response	Inconsolable, agitated	Inconsistently inconsolable, moaning	Cries but consolable, inappropriate interactions	Smiles, orients to sounds, follows objects, interacts	N/A
Motor	No motor response	Extension to pain (decerebrate response)	Abnormal flexion to pain for an infant (decorticate response)	Infant withdraws from pain	Infant withdraws from touch	Infant moves spontaneously or purposefully

Table 1: Paediatric glasgow coma scale.

RESULTS

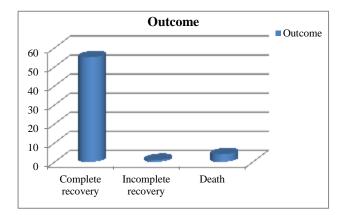


Figure 1: Graph depicting outcome of cases.

The average time of presentation since injury was 9 hours 30 minutes, though many cases presented within 3 hours after injury, this may be because some cases were referred to the tertiary centre after primary care at local hospitals. The most commonly affected age group was 1-5 years, this reflects the fact that since the children in this age group are very active without fear of consequence, even small amount of carelessness on the part of the caretaker can lead to injury. The commonest mode of injury was fall from height reflecting residence at improper housing structures with unprotected roofs. GCS score in most cases was 15/15 indicating the children have a better prognosis in case of moderate to mild head trauma as the fontanelles are open. Parietal bone fracture was the commonest CT scan finding in children and lacerated wounds over the face and scalp was the most common associated injury. An overwhelming 96% cases

recovered with conservative management, one case was discharged with a GCS <10 but subsequently improved on follow up and four deaths were reported.

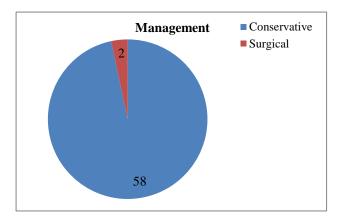


Figure 2: Graph depicting type of management.

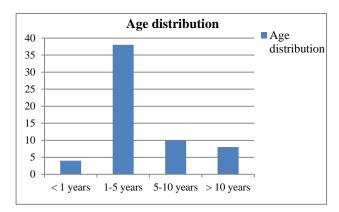


Figure 3: Graph depicting age distribution of cases.

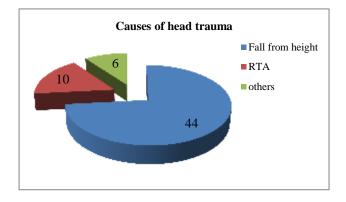


Figure 4: Graph depicting causes of head trauma.

DISCUSSION

Trauma is the second most common cause of death after infections in children. Fall from height is the most common mode of injury for head trauma in children. There are many studies from developing countries which report fall from height as the most common mode of injury which correlates with the findings in our study. This is also related to the fact that the income

group presenting to this hospital don't have access to homes with protected roof tops. The most commonly affected age group in our study was 1-5 years reflecting the ability of older children to take care of themselves. Boys are more commonly affected than girls in most studies but in our study girls were more commonly affected, this may be because the subset studied is very small. Boys are more commonly injured due to their inherent nature.

GCS at presentation was good as children have open fontanels and have better ability to cope with head trauma as the ICT does not rise with mild to moderate head trauma. The associated injuries are parietal bone fractures and lacerated wounds over face and scalp which co-relate well with the commonest mode of injury that is fall from height.

An overwhelming majority of patients recovered well with conservative management indicating a good prognosis in mild to moderate head injury in children <12 years. The findings in our study co relate with another Indian study done at AIIMS about childhood trauma profile and other studies in Southeast Asia.⁵⁻⁷

CONCLUSION

Trauma is one of the most common causes of deaths in children and fall from height is a very common mode of injury. The prognosis in most of the cases of mild to moderate head trauma cases is excellent. Fall from height can be avoided by protecting the roof tops or by avoiding stay on elevated dwellings by families with preschool children. This study emphasis the age old dictum of "Prevention is better than cure."

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