MODE OF HEAD INJURIES IN CHILDREN: EXPERIENCE AT A TERTIARY CARE HOSPITAL OF KHYBER PUKHTOONKHWA

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ABSTRACT

Objectives: To evaluate the mode of head injuries in children.

Material and Methods: This observational study was conducted at the Department of Neurosurgery, Post-graduate Medical Institute, Lady Reading Hospital, Peshawar from July 2010 to June, 2012 (2 years). All patients below 15 years of age who were admitted in the unit with head injuries irrespective of their gender were included in the study. Those head injured patients with age more than 15 years and treated without admission was excluded from the study.

Results: We studied 2178 hospitalized children with traumatic brain injuries (TBI) during the study period, of which 61.6% were boys and 38.4% girls with boy girls ratio of 1.6: 1. Most of the patients (60%) were in the age range of 6-10 years followed by those between 11-15 years (25%) and 0-5 years (15%) respectively. About 52.7% [1148] patients were city residents and 47.3% [1030] patients came from rural villages. Fall (55%), road traffic accidents (25.99%) and physical assault (19%) was the mode of head injuries. Most of the patients (73%) were treated conservatively and mortality in severe head injured was 29.91%.

Conclusion: Pediatric head injuries are more common in male children between 6-10 years of age. Fall is the most common mode of injury followed by road traffic accidents and physical assaults which can be prevented by increased parental care, house safety and implementing the traffic rules. There is immense need of pediatric neurosurgery unit and intensive care unit at every district level.

Key Words: Traumatic brain injury, shaken baby syndrome, craniotomy, severe head injury.

INTRODUCTION

Traumatic brain injury (TBI) account for almost half of all deaths from trauma[1,2]. It is the leading cause of death and disability in children and between 20-30% of attendees at accident and emergency department at U K are children. Children between ages 0-4 years are at higher risk of head injuries[3].

Children are not little adults. The nature of head injury and its consequences can range from mild to severe, and the course of recovery is very difficult to predict for any given child. The symptoms of brain injury in children are similar to those of adults but the functional impact can be very different. The brain of a child is continuing to develop. Therefore brain injury has more devastating impact than on a mature adult. This has physical, cognitive and emotional impairments in children and affects their behavior, moods, and personality[4].

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Another important aspect of head injuries in children is the inflicted head trauma resulting in to shaken baby syndrome having the triad of retinal hemorrhage, mixed density subdural, and/or subarachnoid hemorrhage with little signs of external trauma[5-7]. This is responsible for almost 33% of head injuries in infants[8].

As there is limited local study on mode of head injuries in pediatric age group, this study will help us to know about the trends of head injury in children and thus its prevention and better management.

MATERIAL AND METHODS

This observational study was conducted at the Department of Neurosurgery, Post-graduate Medical Institute, Lady Reading Hospital, Peshawar from July 2010 to June, 2012 (2 years). All the patients below 15 years of age who were admitted in the unit with head injuries irrespective of their gender were included in the study. Those head injured patients with age more than 15 years and treated without admission was excluded from the study. The clinical record of the patients was evaluated. After taking approval from the hospital ethical committee, Consent was taken from the patients relatives. The demographic and clinical data of the patients was entered in a specifically designed Performa. This data was analyzed using SPSS version 11.

RESULTS

We studied 2178 hospitalized children with traumatic brain injuries (TBI) during the study period. The results are given below

Gender of patients: Out of 2178 cases, 1342 were boys and 836 girls with boys / girls ratio of 1.6: 1. As given in Table 1.

Age of patients: The age of patients ranged from 0 to 15 years. Most of the patients were in the age range of 6-10 years followed by those between 11-15 and 0-5 years respectively, as given in Table 2.

Geographical distribution: There were 1148 (52.7%) patients from urban areas and 1030 (47.3%) patients from rural villages.

Mode of head injuries: as given in Table 3

Severity of head injuries: Given in Table 4 according to Glasgow coma scale.

Mortality: Mortality in severe head injured was 137 out of 458 making it 29.91%.

Table 1: Gender distribution

Gender	No. of patients	%age	Ratio
Boys	1342	61.6%	1.6
Girls	836	38.4%	01

Table 2: Age of the patients

Age in years	Number of patients	%age
0-5 years	327	15%
6-10 years	1306	60%
11-15 years	545	25%

Table 3: Mode of head injury

Mode of injury	No. of patients	%age
Fall	1198	55%
Road traffic accident	566	26%
Physical assault	414	19%
Total	2178	100%

Table 4: Severity of head injury

Severity of injury	No. of patients	%age
Mild	783	35.95%
Moderate	937	43.02%
Severe	458	21.03%
Total	2178	100%

Table 5: Management

Management	No. of patients	%age
Conservative	1590	73%
Surgery	588	27%

DISCUSSION

Head injury is the most common cause of death in trauma and account for about 50% of deaths at the accident site[9]. In spite of best management of head injury victims, about 15-20 % is fatal[10], Twenty five to thirty per cent of patients admitted with head injuries are children[11].

We had total of 2178 children with traumatic brain injuries during the study period. The most common age group affected in our study was between 6-10 years (60%) followed by 11-15 years (25%) and 0-5 years (15%). Accidental deaths in infancy and early childhood often result from young children's lack of understanding of the dangers of certain situations and their physical inability to safeguard themselves in lethal circumstances[12,13].

Traumatic brain injuries are more common in males in all age groups[14]. Ivan and colleagues[15] studied 889 children with head injuries the boy girls ratio was 2:1. This was reflected in our study. We had more boys (61.6%) with head injury than girls (38.4%) with boy girls ratio of 1.6: 1. This may be because male children are involved in outdoor activities and games as compared to female and are more exposed to accidents and trauma[16,17].

Transport, falls and assault/abuse together account for 88,4% of all causes of head injury[18]. The most common mode of head injuries in our study was fall from height (55%) followed by road traffic accidents (26%) and physical assaults (19%) respectively. Reece and colleagues[16] studied children with head injuries. Their results are comparable. The most common cause of injury in their study was fall (58%) followed by road traffic accidents (23%) and physical assaults. In another study fall was also the most common cause of head injury[15]. Some studies have reported that road traffic accident (44.4%) is the most common mode of head injury followed by history of fall (32.2%)[10,19,20]. The results vary about the most common cause of head injury. This could be because of the difference in social development, safety of home and traffic in different parts of the globe. As most of our people live in rural areas where density of traffic is low, homes are less safe for children and they climb on trees for joy or work, so they are more prone to fall than traffic accidents.

Head injuries are classified in to mild, moderate and severe according to Glasgow comma scale (GCS). Almost ninety per cent (90%) of head injuries are mild,

8% moderate and 3% severe[21]. One study reported that 14% of their patients had severe head injury[22]. In our study we observed that moderate type of head injury was more common (43%) than severe (21%). This difference in the results could be because of the fact that most of our patients with mild head injury with no risk factors are treated without hospitalizations and were excluded from the study.

In our study 27% of the patients were subjected to cranial surgery, the rest were treated conservatively. The mortality in severe head injured patients was 29.91%. Studies have reported mortality between 6-50% of children having severe head injuries[23]. The overall outcome for children with head injuries is better than that for adults with the same injury scores[24,25]. The possible reason for high mortality in our study could be because of the long distance they have to cover to reach tertiary care hospital and lack of pediatric neurosurgery care.

CONCLUSION

Pediatric head injuries are more common in male children between 6-10 years of age. Fall is the most common mode of injury followed by road traffic accidents and physical assaults which can be prevented by increased parental care, house safety and implementing the traffic rules. There is immense need of pediatric neurosurgery unit and intensive care unit at every district level.

REFERENCES

1. Usman M, Ali M, Tariq A. Acute extradural haematoma in pediatric age group: A study of 50 cases. Pak. J. of Neurol. Surg.- 2009; 13(2): 65-69.
2. Pomsky TA, Eichelberger MR, Cardozo E, Huang ZJ, Pratsch GL, Thumacroom SE, et al. Analysis of head injury admission trends in an urban American pediatric trauma center. J Trauma 2005; 59: 1292-7.
3. Dawodu, ST, Yadav RR, Talavera F, Salcido R, Allen KL, Campagnolo DI. Traumatic brain injury: Definition, epidemiology, pathophysiology. [Online] 2007 [cited on 2007 october 03]. Available from: URL: // http://www.emedicine.com/pnir/topic 212.htm.
4. Jenny C. Preventing head trauma from abuse in infants. CMAJ. 2009 31; 180(7): 703-704.
5. Gerber P, Coffman K. Non-accidental head trauma in infants. Childs Nerv Syst. 2007 May; 23(5):499-507. Epub 2007 Mar 17.
6. Tung GA, Kumar M, Richardson RC, Jenny C, Brown WD. Comparison of accidental and non-accidental traumatic head injury in children on non-contrast computed tomography. Pediatrics. 2006 Aug; 118(2): 626-33.
7. Caffey J. The whiplash shaken infant syndrome: manual shaking by the extremities with whiplash-induced intracranial and intraocular bleedings, linked with residual permanent brain damage and mental retardation. Pediatrics 1974; 54: 396-403.
8. Vinchon M, Defoort-Dhellemmes S, Noulé N, Duhem R, Dhellemmes P. [Accidental or non-accidental brain injury in infants. Prospective study of 88 cases]. Presse Med. 2004 Oct 9; 33(17): 1174-9.
9. Søreide K, Krüger AJ, Ellingsen CL, Tjosevik KE. Pediatric trauma deaths are predominated by severe head injuries during spring and summer. Scand J Trauma Resusc Emerg Med. 2009 Jan 22; 17: 3. doi: 10.1186/1757-7241-17-3.
10. Usman M, Ali M, Khan K M et al. Road trafiic accident- a preventable cause of head injury: experience in lady reading hospital, Peshawar. Pak. J. of Neurol. Surg. 2011; 15 (1): 28-33.
11. Sharma M, Sharma AK, Andir. Mode, presentation, CT findings and outcome of pediatric head injury. Indian Pediatr. 1994 Jun; 31(6): 733-9.
12. Byard RW, Charlwood C. Lethal head entrapment — a problem characteristic of early childhood. J Forensic Leg Med. 2009 Aug;16(6):340-2. doi: 10.1016/j.flm.2009.01.003. Epub 2009 Feb 12.
13. Flavin MP, Dostaler SM, Simpson K, Brison RJ, Pickett W. Stages of development and injury patterns in the early years: a population-based analysis. BMC Public Health. 2006; 6: 187.
14. Tieves KS, Yang H, Layde PM. The epidemiology of traumatic brain injury in Wisconsin, 2001. WMJ. 2005 Feb; 104(2): 22-5, 54.
15. Ivan LP, Choo SH, Ventureyra EC. Head injuries in childhood: a 2-year survey. Can Med Assoc J. 1983 Feb 1; 128(3): 281-4.
16. Reece RM, Sege R. Childhood head injuries: accidental or inflicted? Arch Pediatr Adolesc Med. 2000 Jan; 154(1): 11-5.
17. Jha N, Agrawal CS. Epidemiological study of road traffic accidents cases: A study from eastern Nepal. Regional health forum WHO south East Asia region, 2004; 8(1): 15-22.
18. De Villiers JC, Jacobs M, Parry CD, Botha JL. A retrospective study of head-injured children admitted to two hospitals in Cape Town. S Afr Med J. 1984 Nov 24; 66(21): 801-5.
19. Yattoo G, Tabish A. The profile of head injuries and traumatic brain injury deaths in Kashmir. J Trauma Manag Outcomes 2008; 2: 5. Doi: 10.1186l1752-2897-2-5.
20. Gururaj G. Epidemiology of traumatic brain injuries: Indian scenario. Neurol Res. 2002 Jan; 24(1): 24-8.
21. Crowe L, Babl F, Anderson V, Catroppa C. The epidemiology of paediatric head injuries: data from a referral centre in Victoria, Australia. J Paediatr Child Health. 2009 Jun;45(6):346-50. doi: 10.1111/j.1440-1754.2009.01499.x. Epub 2009 May 28.
22. Nigrovic LE, Lee LK, Hoyle J, Stanley RM, Gorelick

MH, Miskin M, Atabaki SM, Dayan PS, Holmes JF, Kuppermann N. Prevalence of clinically important traumatic brain injuries in children with minor blunt head trauma and isolated severe injury mechanisms. Arch Pediatr Adolesc Med. 2012 Apr;166(4):356-61. doi: 10.1001/archpediatrics.2011.1156. Epub 2011 Dec

23. Shein SL, Bell MJ, Kochanek PM, Tyler-Kabara EC, Wisniewski SR, Feldman K, et al. Risk Factors for Mortality in Children with Abusive Head Trauma. J Pediatr. May 11 2012; [Medline].

24. Garcia GJJ, Martinez IM, De la Maza TSV, et al. [Registry of mild craniocerebral trauma: Multicentre study from the Spanish Association of Pediatric emergencies.]. An Pediatr (Barc). May 21 2009;[Medline].

25. Mackerle Z, Gal P. Unusual penetrating head injury in children: personal experience and review of the literature. Childs Nerv Syst. May 19 2009;[Medline].