



Neurosurgery

PAEDIATRIC HEAD INJURY IN A PERIPHERAL TERTIARY TRAUMA CARE CENTRE

**Dr.S.Senthamarai k annan**

Ms.,M.Ch.,Assistant professor of Neurosurgery,Thanjavur medical college,Thanjavur.

**Dr.R. Hariharasudan\***

M.Ch., Resident,Thanjavur medical college,Thanjavur. \*Corresponding Author

**ABSTRACT**

**Aim of study:**To study on paediatric head injury patients admitted at our trauma unit, in Thanjavur medical college hospital. To analyze the incidence, age, sex, mechanism/ type of injury, associated injuries, presentation, CT findings, management, period of stay and outcome

**Materials and methods:** Study conducted as a retrospective study from March 2016 to February 2017. Total of 103 patients have been admitted and treated. Inclusion criteria – all children admitted with head injury below the age of 12. Exclusion criteria – paediatric head injury cases treated outside for more than 24hrs.

**Conclusion:** Through the retrospective analysis made at Thanjavur medical college hospital trauma unit, we found, Pediatric head injuries compared to adult are relatively uncommon and the most common injury being fracture and EDH rather than SDH as reported in the adult population, and are relatively less severe with very low incidence of mortality

**KEYWORDS :**

**Aim of Study:**

To study on paediatric head injury patients admitted at our trauma unit, in Thanjavur medical college hospital.

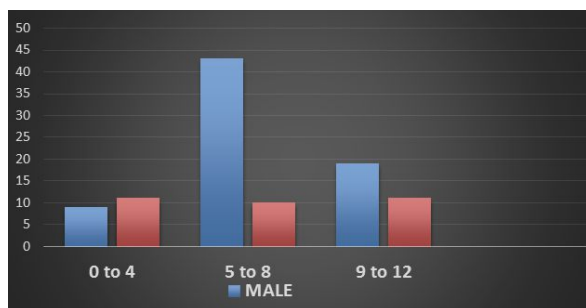
To analyze the incidence, age, sex, mechanism/ type of injury, associated injuries, presentation, CT findings, management, period of stay and outcome

**Materials and methods**

- Study conducted as a retrospective study from March 2016 to February 2017
- Inclusion criteria – all children admitted with head injury below the age of 12
- Exclusion criteria – paediatric head injury cases treated outside for more than 24hrs.
- Total of 103 patients have been admitted and treated

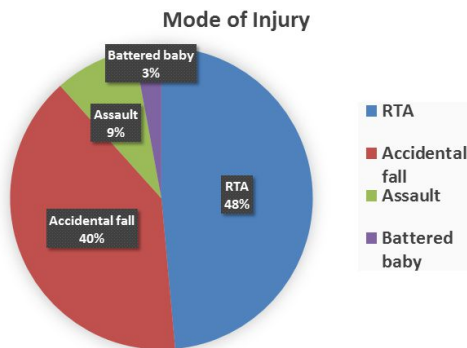
**Age and sex**

Age	Male	Female
0-4	9	11
5-8	43	10
9-12	19	11



**Mode of injury and severity**

- RTA-50
- ACCIDENTAL FALL-41
- ASSAULT-9
- BATTERED BABY-3
- Mild GCS 13-15 - 56
- Moderate 8-12 - 33
- Severe <8 - 14

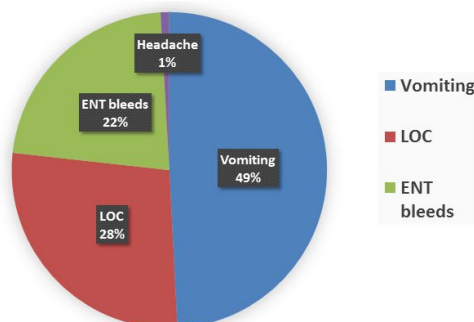


**Associated injuries**

- Clavicle Fracture - 8
- Upper limb fracture -3 (Humerus - 2, Radius - 1)
- Lower limb fracture -3 (Ankle - 2, Both bone - 1)
- Pelvic fracture - 2
- Chest injuries - 6
- Burns - 4

**Symptoms on admission**

- Vomiting - 66
- LOC - 37
- ENT Bleeds - 30
- Headache - 12

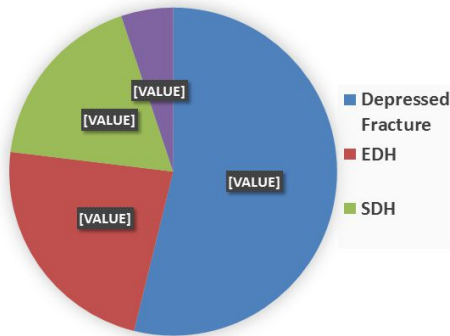


**CT Findings**

- EDH – 17
- SDH – 8
- ICH – 2
- SAH – 16
- CALVARIAL FRACTURE – 53 (Depressed – 25, Linear – 28)
- CRUSH INJURY WITH ICH/EDH/SDH-1
- DIFFUSE INJURY – 20

**Management/ Outcome**

- Surgery – 39
- Conservative – 61
- Death – 3
  - Poly trauma
  - SDH
  - ICH



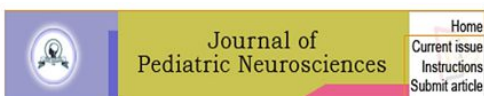
**Period of stay**

- Mean duration of hospital stay was 4.8 days
- 84% of children were staying less than a week in hospital

**Results**

- There was a striking male preponderance (71 vs 32)
- Most common presenting symptoms – vomiting(64%) rather than post traumatic Loss of consciousness(35%)
- Mild head injury(54%) as per GCS score had positive findings.
- Most common mode of injury – RTA(48%) followed by Domestic injuries(45%).
- Most common indication for surgical intervention – Depressed fracture followed by EDH.
- Three Deaths.

**Comparing other national and international studies**



J Pediatr Neurosci, 2011 Jan-Jun, 6(1): 97-98.  
doi: 10.4103/1817-1745.84428

PMCID: PMC3173936

**Pediatric head injury: An epidemiological study**

Pranshu Bhargava, Rahul Singh, Bhanu Prakash, and Rohan Sinha

- This study includes 200 consecutive children aged 12 or less. Amongst the 200 patients aged 12 years or less, there were 123 males and 77 females (M:F = 1.59)
- The most common mode of injury was fall from height (unprotected rooftops while playing) seen in 56.5% of patients, followed by road traffic accident (being hit by a moving vehicle), accounting for 21% of injuries.
- The most common lesion found on CT scan was an extradural hematoma, which was seen in 33 (16.5%) patients.

**A prospective surveillance of paediatric head injuries in Singapore: a dual-centre study**

Shu-Ling Chong,<sup>1</sup> Su Yah Chew,<sup>2</sup> Jasmine Xun Yi Feng,<sup>3</sup> Penny Yun Lin Teo,<sup>4</sup> Sock Teng Chin,<sup>4</sup> Nan Liu,<sup>5</sup> Marcus Eng Hock Ong<sup>6</sup>

- This is a prospective observational study utilising data from the trauma surveillance system from January 2011 to March 2015 on children less than 16 yrs
- Analysed 1049 children, the mean age was 6.7 (SD 5.2) years. 260 (24.8%) had a positive finding on CT. 17 (1.6%) children died, 52 (5.0%) required emergency intubation in the ED and 58 (5.5%) underwent neurosurgery. The main causes associated with severe outcomes were motor vehicle crashes (OR 7.2, 95% CI 4.3 to 12.0) and non-accidental trauma (OR 5.8, 95% CI 1.8 to 18.6). This remained statistically significant when we stratified to children age.

**Conclusion**

Through the retrospective analysis made at Thanjavur medical college hospital trauma unit, we found, Pediatric head injuries compared to adult are relatively uncommon and the most common injury being fracture and EDH rather than SDH as reported in the adult population, and are relatively less severe with very low incidence of mortality.

**REFERENCES**

1. Ringl H, Schernthaner R, Philipp MO, et al. Three-dimensional fracture visualisation of multidetector CT of the skull base in trauma patients: comparison of three reconstruction algorithms. Eur Radiol. 2009 Oct. 19(10):2416-24. [Medline].
2. Boggs W. Point-of-care ultrasound finds skull fractures in children. Medscape Medical News. May 24, 2013. Available at <http://www.medscape.com/viewarticle/804784>. Accessed: June 3, 2013.
3. Rabiner JE, Friedman LM, Khine H, Avner JR, Tsung JW. Accuracy of point-of-care ultrasound for diagnosis of skull fractures in children. Pediatrics. 2013 Jun. 131(6):e1757-64. [Medline].
4. Cakmaki H. Essentials of trauma: head and spine. Pediatr Radiol. 2009 Jun. 39 Suppl 3:391-405. [Medline].
5. Hand L. Major causes of head trauma in children identified. Medscape Medical News from WebMD. Available at <http://www.medscape.com/viewarticle/834854>. November 13, 2014; Accessed: November 21, 2014.
6. Quayle KS, Holmes JF, Kuppermann N, et al. Epidemiology of blunt head trauma in children in U.S. emergency departments. N Engl J Med. 2014 Nov 13. 371(20):1945-7. [Medline].
7. Williams K, Wainwright MS. Pathophysiology and management of moderate and severe traumatic brain injury in children. J Child Neurol. 2016 Jan. 31(1):35-45. [Medline].
8. Toda N, Ayajiki K, Okamura T. Cerebral blood flow regulation by nitric oxide: recent advances. Pharmacol Rev. 2009 Mar. 61(1):62-97. [Medline].
9. Yeates KO, Taylor HG, Rusin J, et al. Longitudinal trajectories of postconcussive symptoms in children with mild traumatic brain injuries and their relationship to acute clinical status. Pediatrics. 2009 Mar. 123(3):735-43. [Medline].
10. Hymel KP, Stoiko MA, Herman BE, et al. Head injury depth as an indicator of causes and mechanisms. Pediatrics. 2010 Apr. 125(4):712-20. [Medline].
11. Allard RH, van Merkesteyn JP, Baart JA. [Child abuse]. Ned Tijdschr Tandheelkd. 2009 Apr. 116(4):186-91. [Medline].
12. Iranmanesh F. Outcome of head trauma. Indian J Pediatr. 2009 Sep. 76(9):929-31. [Medline].
13. Garcia Garcia JJ, Manrique Martinez I, Trenches Sainz de la Maza V, et al for the Grupo de Trabajo de Trauma Craneal de la SEUP. [Registry of mild craniocerebral trauma: multicentre study from the Spanish Association of Pediatric emergencies]. An Pediatr (Barc). 2009 Jul. 71(1):31-7. [Medline].
14. Mackerle Z, Gal P. Unusual penetrating head injury in children: personal experience and review of the literature. Childs Nerv Syst. 2009 Aug. 25(8):909-13. [Medline].
15. Haider AH, Crompton JG, Oyettunji T, et al. Mechanism of injury predicts case fatality and functional outcomes in pediatric trauma patients: the case for its use in trauma outcomes studies. J Pediatr Surg. 2011 Aug. 46(8):1557-63. [Medline].
16. Shein SL, Bell MJ, Kochanek PM, et al. Risk factors for mortality in children with abusive head trauma. J Pediatr. 2012 Oct. 161(4):716-722.e1. [Medline].
17. Kapapa T, Pfister U, Konig K, et al. Head trauma in children, part 3: clinical and psychosocial outcome after head trauma in children. J Child Neurol. 2010 Apr. 25(4):409-22. [Medline].
18. Ley EJ, Srour MK, Clond MA, et al. Diabetic patients with traumatic brain injury: insulin deficiency is associated with increased mortality. J Trauma. 2011 May. 70(5):1141-4. [Medline].