

## ORIGINAL ARTICLE

# HEAD INJURIES IN ROAD TRAFFIC ACCIDENTS: ASSESSMENT OF RADIOLOGICAL FINDINGS - A HOSPITAL BASED STUDY

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### ABSTRACT:

**Background:** Head injury is a major public health problem and has already attained epidemic proportions in India. The present study aims to evaluate the distribution, nature and types of head injuries received during road traffic accident, fall, assault and also assesses importance of CT scans so that consequences due RTAs can be estimated and thus possible preventive measures can be drawn. **Methodology:** The present retrospective study was conducted over 140 patients who were admitted in the hospital with head injury and were referred to radiology department for investigations and radio diagnosis. The type of trauma was further classified into road traffic accident, fall and assault. Head injuries were further divided according to the pattern of injury obtained from CT scans. Statistical analysis were carried out using Chi-square test with  $p < 0.05$  was considered as significant value. **Results:** 80% were injured by road traffic accident, 7% by assault and 18% due to fall. Out of 112 patients of RTA were 87 male and 25 female patients with significant p value with  $p < 0.03$ . Findings based on radiological assessment showed that fracture of skull was diagnosed in 57.14%, cerebral edema in 43.57%, mass effect in 13.57%, subdural hematoma in 15.71%, extradural hematoma in 7.85%, intra cerebral hematoma in 13.57%, pneumocranium in 2.14% cases and intra ventricular haemorrhage in 3.57%. **Conclusion:** As a public health problem, road accidents are amenable to treatment by the methodology applied to epidemic disease, including the detailed investigation of individual incidents and the application of epidemiological techniques. CT scan can precisely evaluate the parenchymal damage of the brain of head injury victims rapidly and non-invasively, for timely and effective management as patients with head injury deteriorate suddenly.

**Keywords:** Road traffic accidents; Radio diagnosis; CT scan; Head injury; Craniocerebral trauma

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## INTRODUCTION

Amongst all traffic accidents, road traffic accidents claim largest toll of human life and tend to be the most serious problem world over. Worldwide, the number of people killed in road traffic accidents (RTA) each year is estimated at almost 1.2 million, while the number of injured could be as high as 50 million.<sup>1</sup> Head injury is a major public health problem and has already attained epidemic proportions in India. As a result craniocerebral trauma places a huge financial and psychological burden upon the society. In India, the problem has become more acute over the last two decades, mainly due to increased vehicular traffic and poor maintenance on the road. The numbers of head injury cases are expected to increase further, due to urbanization, increase vehicular load and high speed bikes. The analysis of prognosis in head injury is crucial depending up on the specialized

care team involved in their management.<sup>2</sup> Thus, the present study aims to evaluate the distribution, nature and types of head injuries received during road traffic accident, fall, assault and also assesses importance of CT scans so that consequences due RTAs can be estimated and thus possible preventive measures can be drawn.

## MATERIAL AND METHODS

The present retrospective study was conducted over 140 patients who were admitted in the hospital with head injury and were referred to radiology department for investigations and radio diagnosis. Ethical clearance was taken from the ethical committee of the institute. Patient history and radio diagnosis was obtained as per the proforma attached. The type of trauma was further classified into road traffic accident, fall, assault and any other miscellaneous reason. Head injuries

were further divided according to the pattern of injury obtained from CT scans.

**RESULT**

The present study found that demographic profile of total 140 cases with head injury referred to the department of radio diagnosis were 7% male and 1% female in age group between 0 to 15 years, 25% male and 12% female in the age group of 16-30 years of age, 16% male and 11% female in age group of 31-45 years, 9% male and 7% females in age group of 46-60 years and 6% male, 4 % female were aged above 61 year (table 1 and graph 1).

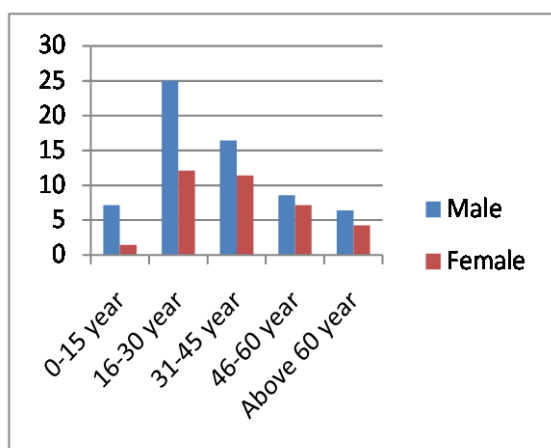
Distribution of data according to reason of head injury revealed that 80% were injured by road traffic accident, 7% by assault and 18% due to fall (table 2, graph 2). Out of 112 patients of RTA were 87 male and 25 female patients with significant p value with  $p < 0.03$ .

**Table 1:** Age and sex of patients with head injury in study group(N=140)

Age in year	Male	Female
0-15	10 (7.14%)	2 (1.42%)
16-30	35 (25%)	17 (12.14%)
31-45	23 (16.42%)	16 (11.42%)
46-60	12 (8.57%)	10(7.14%)
>61	9 (6.42%)	6 (4.28%)

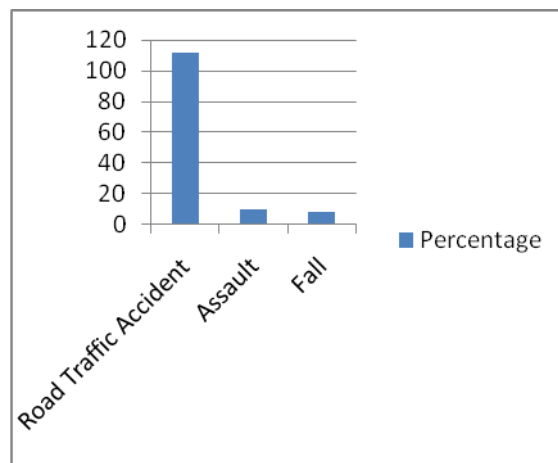
**Table 2:** Distribution according to reason of head injury

Reason	No. of incidence
Road Traffic Accident	112 (80%)
Assault	10 (7%)
Fall	18 (13%)



**Graph 1:** Patients with head injury

**Graph 2:** Different reasons of injury



**Table 3:** Findings based on Radiological assessment (N=140 )

Finding	Total Cases
Fracture	80 (57.14%)
Cerebral edema	61(43.57%)
Mass effect	19(13.57%)
Subdural hematoma	22(15.71%)
Extradural hematoma	11(7.85%)
Intra cerebral hematoma	19(13.57%)
Pneumocranium	3(2.14%)
Intra ventricular Haemorrhage	5(3.57%)

**DISCUSSION**

Trauma due to road traffic accidents is a preventable epidemic neglected by many governments, usually in developing countries. Major devastating effect of trauma is head injury which sometimes proves to be fatal.<sup>3</sup>The demographic profile of patients reveals that majority of the victims were in age group of 15-45 years with male predominance. 78% victims of RTAs were males. Our results are similar to study conducted by Yadav SK et al<sup>4</sup> in Chitwan, Nepal who reported that 90% head injuries were due to road traffic accidents with 87.30% victims were males. Similarly, a study conducted in Southern India, Belgaum, Karnataka by Palled ER et al<sup>5</sup> also reported that Cranio cerebral trauma was common in young male (85%) and RTA was the common mode of injury (63%) with peak incidence in the 21-30 age group. This male predominance is also observed by Singh P et al,<sup>6</sup> Biswas G et al,<sup>7</sup> Tirpude BH et al<sup>8</sup> which is due to the fact that being the major bread earners as compared to females, males spent most of their times outdoor, hence exposing themselves to the hazards of roads.<sup>6</sup>

Road traffic accidents are increasing day by day to increase in competition in all fields due to which the younger generation has to move from place to place in search of a suitable job and sometimes the job demands too much travelling on their part. The increasing use of mobile phones while driving is acquiring an epidemic proportion and the number of accidents during such negligent driving has not been reported accurately.<sup>4</sup>

Early and precise determination of cranio-cerebral lesions in acute head trauma is of great importance because of the high mortality caused by these lesions and the fact that early diagnosis and treatment will significantly reduce the complications. In this era of interventional radiology, CT scan is now the primary modality for evaluation of patients with acute head trauma.<sup>9</sup> CT scan assessment in the present study revealed that fracture of skull was diagnosed in 57.14%, cerebral edema in 43.57%, subdural hematoma in 15.71%, mass effect in 13.57%, extradural hematoma in 7.85%, intra cerebral hematoma in 13.57%, pneumocranium in 2.14% cases and intra ventricular haemorrhage in 3.57%. Palled ER et al<sup>5</sup> observed that contusion (57.6%) was the most common finding on CT scan of craniocerebral trauma patients followed by (55.40%), cerebral edema (48.9%). Whereas Yadav SK et al<sup>4</sup> found that among the head injuries with maxillofacial trauma extradural hematoma 22.22% was the most common finding, followed by subdural hematoma (17.46%) and subarachnoid hemorrhage (14.28%). Kumar L et al<sup>2</sup> evaluated pattern of head injuries in RTAs and found that commonest lesion was scalp laceration followed by fractures to the skull (commonest in intra-cranial lesions); subdural haemorrhage was commonest intra cranial hemorrhage followed by sub arachnoid haemorrhage in the case sustaining the Head Injury. Gupta PK et al<sup>10</sup> evaluated CT scans of head injury patients to study nature and location of lesions and found that Cerebral edema was detected in 63.4% of the cases, followed by skull fracture (62%), hemorrhagic contusion (46.3%), and epidural hematoma (30.4%). Acute subdural hematoma was present in 19.4% and subarachnoid hemorrhage was seen in 28.8% patients, midline shift in 24.3% patients, pneumocranium in 12% and intra-ventricular hemorrhage in 10.7% of the patients. Cases of head injury with fractures of the skull tend to have more complications and are more often fatal than those without fracture.<sup>2</sup> CT scanning of the head is used to detect bleeding, brain injury and skull fractures in patients with head injuries; bleeding caused by a ruptured or leaking aneurysm in a patient with a sudden severe

headache; a blood clot or bleeding within the brain shortly after a patient exhibits symptoms of a stroke; a stroke, especially with a new technique called Perfusion CT; brain tumors; enlarged brain cavities (ventricles) in patients with hydrocephalus; diseases or malformations of the skull.<sup>11</sup>

Doddamani RS et al<sup>12</sup> conducted a study among 201 patients of traumatic brain injury who were followed with serial CT scans for a maximum of up to 5 scans to determine the role of serial CTs in demonstrating changes in intracranial lesions and the influence on management. The study concluded that repeat CT scans resulted in management changes even in patients with no clinical deterioration and thus may be of value in detecting changes at an early stage. CT scan has been a boon for medical care. By generating detailed anatomical pictures, the technology can improve diagnoses, limit unneeded medical procedures and can thus, enhance treatment.<sup>13</sup>

## CONCLUSION

As a public health problem, road accidents are amenable to treatment by the methodology applied to epidemic disease, including the detailed investigation of individual incidents and the application of epidemiological techniques. The tragedy of Road Traffic Accidents is that they particularly involve young, perhaps the young and adventurous. Males aged 16-45 years are especially involved; fatal accidents in this group represent not only tragic family losses but also a serious economic loss to the community. CT scan can precisely evaluate the parenchymal damage of the brain of head injury victims rapidly and non-invasively, for timely and effective management as patients with head injury deteriorate suddenly.

## REFERENCES

1. Kual A, Sinha US, Pathak YK, Singh A, Kapoor AK, Sharma S, Singh S. Fatal road traffic accidents, study of distribution, nature and type of injury. *JIAFM*, 2005 : 27 (2):71-6.
2. Kumar L, Agarwal S, Singh T, Garg R. Patterns of Head Injury at Tertiary Care Hospital. *International Journal of Scientific Study*. 2014;1(5):5-8.
3. Akanji AO, Akinola RA, Balogun BO, Akano AO, Atalabi OM, Akinkunmi MAN, Awosanya GOG. Computerized tomography scan and head injury: the experience in tertiary hospital in Nigeria: A cross sectional study. *Journal of Medical Practice and review* 2015;6(1):1-15
4. Yadav SK, Mandal BK, Karn A, Sah AK. Maxillofacial trauma with head injuries at a tertiary care hospital in Chitwan, Nepal: clinical, medico-legal and critical care concerns. *Turk J Med Sci* 2012; 42 (Sup.2):1505-12.

5. Palled ER, Chandrapal T. A Descriptive Study of Patients of Cranio-Cerebral Trauma at Tertiary Care Hospital. *International Journal of Recent Trends in Science And Technology* 2014;10,(2):281-3.
6. Singh PK, Slong D, Devi MT. Pattern of Road Traffic Accidents in Imphal. *J Indian Acad Forensic Med* 2012;34(4):301-3.
7. Biswas G, Verma SK, Sharma JJ, Aggarwal NK. Pattern of road traffic accidents in North East Delhi. *JFMT* 2003; 20(1): 27 - 29.
8. Tirpude BH, Naik RS, Anjankar AJ, Khajuria BK. A study of the pattern of cranio – cerebral injuries in road traffic accidents. *JIAFM* 1998;20(1):9-12.
9. Sah SK, Subedi ND, Poudel K, Mallik M. Correlation of Computed Tomography findings with Glasgow Coma Scale in patients with acute traumatic brain injury. *Journal of College of Medical Sciences-Nepal*, 2014, Vol-10, No-2
10. Gupta PK, Krishna A, Dwivedi A, Gupta K, Bala M, Garg G, Agarwal S. CT Scan Findings and Outcomes of Head Injury Patients: A Cross-Sectional Study
11. Computed Tomography (CT)-head. Available at: <http://www.radiologyinfo.org/en/pdf/headct.pdf>
12. Doddamani RS, Gupta SK, Singla N, Mohindra S, Singh P. Role of repeat CT scans in the management of traumatic brain injury. *The Indian Journal of Neurotrauma* 2012;9:33-9.
13. CT Scans: Balancing Health Risks and Medical Benefits. *Environmental Health Perspectives* 2012;120(3):119-121. Available at: <http://ehp.niehs.nih.gov>

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