



**ORIGINAL RESEARCH PAPER**

**Forensic Medicine**

**ANALYSIS OF INTRACRANIAL HAEMORRHAGE CASES BROUGHT FOR AUTOPSY AT ASSAM MEDICAL COLLEGE & HOSPITAL, DIBRUGARH, ASSAM.**

**KEY WORDS:** Intracranial haemorrhage, Subdural haemorrhage, Road traffic accident, pedestrian, Autopsy.

**Dr. Tarun Kumar Das** Associate Professor, Department of Forensic Medicine, Assam Medical College & Hospital, Dirugarh, Assam.

**Dr. Nayan Mani Pathak\*** Associate Professor, Department of Forensic Medicine, Assam Medical College & Hospital, Dirugarh, Assam. \*Corresponding Author

**Dr. Rupak Kumar Gogoi** Professor, Department of Forensic Medicine, Assam Medical College & Hospital, Dirugarh, Assam.

**ABSTRACT**

**Background:** The study was undertaken to observe different demographic and causative factors of Intracranial Haemorrhage and to suggest some preventive measures.

**Material and methodology:** This observational and descriptive study was done in The Department of Forensic Medicine, Assam Medical College & Hospital, Dibrugarh, Assam, retrospectively for two years periods.

**Results:** Most of the cases of Intracranial Haemorrhage were found to be due to road traffic accidents (74%). Pedestrian was the most common victim of road traffic accident (44.9%). Subdural haemorrhage alone or, in combination found in 66% cases.

**Conclusion:** Road traffic accidents were the commonest causative factors of Intracranial haemorrhage. Proper improvement of road condition, communication and obeying of road safety measures will surely help to reduce the menace of road traffic accident and thereby reducing morbidity and mortality.

**INTRODUCTION:**

Intracranial haemorrhage is a frequent finding seen at medicolegal autopsy. Various incidences like road traffic accident, fall from height, physical assault and also to some extent natural caused or disease process may lead to intracranial haemorrhage.

Intracranial haemorrhage (ICH) following road traffic accidents (RTA) is one of the major causes of mortality and morbidity worldwide. Further, in a developing nation like India with large number of population and continuous process of modernization, urbanization and road condition causes increased number of vehicular accidents leading to hospitalization, disabilities and also death.

The present study was undertaken to observe different factors responsible for intracranial haemorrhage and its impact on the population and also to suggest preventive measures.

**MATERIAL AND METHOD:**

The study was undertaken in retrospective manner for a period of two years from January, 2018 to December 2019 in the Department of Forensic Medicine, Assam Medical College & Hospital, Dibrugarh, Assam.

During the period a total number of 2875 autopsies were done in the department, out of which 253 numbers of cases found to have intracranial haemorrhage.

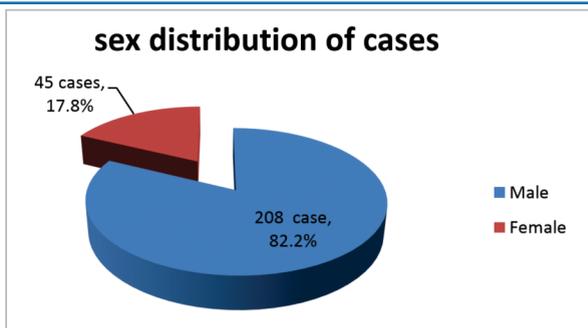
Apart from the post-mortem report, other documents submitted by the police and accompanying persons and hospital documents were also evaluated.

All these information was compiled, analysed, discussed thoroughly comparing with studies by other authors whenever possible.

**RESULT AND OBSERVATION:**

253 cases (8.8%) had intracranial haemorrhage in the autopsy finding.

Male population comprised of 208 cases (82.2%) and female cases was 45 in number (17.8%).



**Diagram 1: Sex distribution of cases:**

Age between 21-30 years constituted a majority of victim (66 Cases, 26.1 %) followed by age range 31-40 years (53 Cases, 21 %).

**Table 1: Age wise distribution of cases**

Age in years	Number of cases	Percentage
0-10	5	02%
11-20	15	5.9%
21-30	66	26.1%
31-40	53	21%
41-50	48	19%
51-60	35	13.8%
61-70	23	09%
71-80	8	3.2%

Out of all intracranial haemorrhage cases 74 % (187 Number) cases were due to road traffic accidents. Only in 2 % (5 cases) were due to natural origin.

**Table 2: Causative factors of Intracranial haemorrhage (ICH)**

Cause of ICH	Number of Cases	Percentage
Road traffic accident	187	74%
Fall from height	52	20.5%
Physical assault	09	3.5%
Natural cause	05	2%
Total	253	100%

It was seen that in the Road traffic accident incidences (RTA), pedestrians are the most common victim (84 cases, 44.9%)

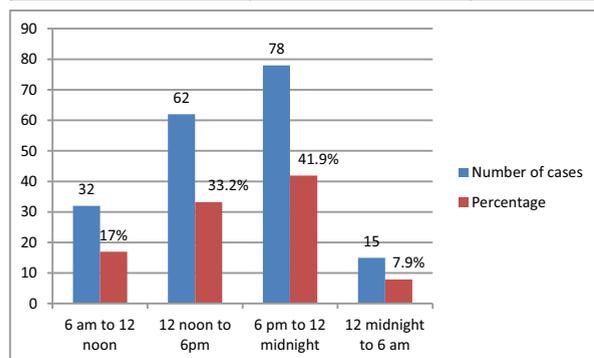
followed by driver of the vehicle (41 cases, 21.9%).

**Table 3: Category of victim in RTA cases**

Category of victim	Number of cases	Percentage
Pedestrian	84	44.9%
Driver	41	21.9%
Occupants of vehicle	25	13.4%
Two wheeler rider	28	15%
Bicyclist	09	04.8%
Total	187	100 %

Maximum number of Road traffic accident cases occurred in the time period of 6 pm to 12 midnight (78 cases, 41.9%) followed by 62 cases (33.2%) in the time period of 12 noon to 6 pm.

Time of incidence	Number of cases	Percentage
6 am to 12 noon	32	17%
12 noon to 6pm	62	33.2%
6 pm to 12 midnight	78	41.9%
12 midnight to 6 am	15	07.9%



**Diagram 2: Time of incidence of RTA cases**

In the study 68 number (26.9%) patients with intracranial haemorrhage died on the spot, 129 cases (51%) reached hospital after the incidence.

**Table 4: Distribution of cases on the basis of place of death**

Place of death	Number of cases	Percentage
Hospital	129	51%
On the way to hospital	56	22.1%
On the spot	68	26.9%
Total	253	100%

Out of all types of Intracranial haemorrhage maximum number of cases had subdural haemorrhage alone or in combination with other types (167 cases, 66%).

**Table 5: Distribution of Intracranial haemorrhage (ICH)**

Types of ICH	Number of cases	Percentage
Subdural haemorrhage (SDH)	121	47.8%
Extradural haemorrhage ( EDH)	47	18.6%
Subarachnoid haemorrhage (SAH)	35	13.8%
SDH+EDH	30	11.8%
SDH+EDH+SAH	9	03.6%
SDH+ Intracerebral haemorrhage	7	02.8%
Intracerebral haemorrhage	4	01.6%
Total	253	100%

Out of 129 (51 %) cases who reached hospital, 41 case (31.8) cases died within the first 24 hours of hospitalization.

**DISCUSSION:-**

Our study showed 8.8% of cases of all autopsies during this study periods had Intracranial haemorrhage.

Number of cases found to be much higher in male (208 cases, 82.2%). P. Shruthi et al found male constituted 78.22% of total

victim.<sup>1</sup> MabroukA et al also found male preponderance. <sup>2</sup> Chourasia S et al found males comprised a majority and constituted 80% cases.<sup>3</sup>

In the present study we found 47.1% cases were in the age group of 21 to 40 years. Mabrouk A et al in his study in 4 years found that the highest incidence is in the age group of 20 to 40 years. <sup>2</sup> P. Shruthi et al found that 55.11% victim were in the age group of 21 to 30 years.<sup>1</sup>

The Intracranial haemorrhage cases in our study found mostly in road traffic accidents (74%) followed by from fall from height which constituted 20.5%. Liko O et al found in their study of 274 head injury cases that motor vehicular accidents in (49%) cases were the commonest cause of injury, which was followed by fall from height cases (17%).<sup>4</sup> Taygi A.K. et al found majority of Intracranial Haemorrhage cases in vehicular accidents, followed by fall from height cases.<sup>5</sup>

In our study 44.9% cases in road traffic accidents were pedestrian, followed by driver of vehicle which was 21.9%. Zhou J.H, et al found 44% incidents in pedestrian and 42.5% in passenger.<sup>6</sup> Daunipaia S. and Devi M et al found that pedestrian 38.89% were the commonest victim.<sup>7</sup>

Present study showed that the time of incidence in road traffic accidents was maximum (41.9%) in the time period of 6pm. to 12 Midnight, which was followed by 33.2% cases in the time of 12 Noon to 6 pm. Khare N. et al, in their study found that most common time of occurrence of in road traffic accidents was 6 pm to 12 pm ( 62%) cases.<sup>8</sup> Menon A et al, found fatal head injuries were due to vehicular accidents and most of the accidents occurred in the afternoon and evening hours.<sup>9</sup>

Our study showed 129 cases (51%) victim died in the hospital and victim died on the spot was 26.9%. P. Shruthi et al found 67.11% cases died in the hospital and 23.11% died on the spot.<sup>1</sup> Findings of some other studies are not similar to our findings, which may be due to the better communication and increasing number of health care facility, in which patient reached at the earliest.

Amongst the different types of intracranial haemorrhage, we found subdural haemorrhage alone or, in combination with other types were the maximum (66% cases) which was followed by extradural haemorrhage alone or, in combination in 34% cases. Pathak A. et al, found the incidence of subdural haemorrhage to be 70%, while the extradural haemorrhage to be 10.13%.<sup>10</sup> Liko O. et al, found subdural haemorrhage in 67% cases and followed by extradural haemorrhage in 20% cases.<sup>4</sup>

Only in 2% cases we found spontaneous intracranial haemorrhage. It is less in number in our study as it is a natural cause of death and routine autopsy is not performed.

In our study we found only 31.8% cases survived up to a periods of 24 hours after hospitalisation. In the study by Chourasia S, Rudra A found 34% cases died between 16 to 24 hours of incidence.<sup>3</sup>

**CONCLUSION:-**

Majority of the head injury cases leading to intracranial haemorrhage happens following road traffic accidents. India being a developing country, though the road condition, proper lighting and road signs are improving day by day, but still needs lots of modification and up gradation. As it was seen pedestrian suffer a lot in road traffic accidents, focus should be given for increasing awareness amongst the pedestrian regarding road safety rules. Driver of vehicle should also have the basic knowledge about safety of driving and should do regular maintenance of the vehicle. Also improvement of communication and early hospitalisation may help to reduce morbidity and mortality.

**REFERENCES :-**

1. P. Shruthi, V.T. Venkatesh, B. Viswakanth, C. Ramesh, et al (2013). Analysis of Fatal Road Traffic Accidents in a Metropolitan City of South India. *J Indian Acad Forensic Med.* October – December 2013, Vol. 35, No. 4, pp 317-320
2. Mabrouk A, Helal H, Mohamed AR, Mahmoud N. (2014). Incidence, etiology, and patterns of maxillofacial fractures in ain-shams university, Cairo, Egypt: a 4-year retrospective study. *Cranio maxillofac Trauma Reconstr. Sep;* 7(3):224-32. Doi:10.1055/s-0034-1374061.
3. Chourasia S, Rudra A. (2017). An autopsy study of pattern of Fatal Cranio-Cerebral Injuries due to blunt force trauma at Medico legal Centre of Tertiary Healthcare Centre. *J of Med. Science and Clinical Research*, Vol. (05), Issue. (09). Page. 27522-30.
4. Liko O, Chalau P, Rosenfeld JV and Watters DA (1996) Head injury in Papua New Guinea, *PNG Medical Journals*, 39(2) 100-104.
5. Taygi A.K, Sharma G.K, Kumar B. (1986) Cranio cerebral damage by blunt force impact. *Journal of Indian Academy of Forensic Medicine*, 1:24-39.
6. Zhou JH, Zhao XC, Wang ZG, Zhu PF, et al (2003) The analysis of epidemiological characteristics of road traffic crashes in mountain city in western China. *Chin J Traumatol.* Dec; 6(6):355-8.
7. Daunipaia S, Devi M. (2013) Pattern of Head Injuries in Road Traffic Accidents in Imphal. *IScholar Journal. Medico legal update.* Vol 13, No 1, Pages: 6-9.
8. Khare N, Gupta S.K, Varshney A, Athavate AV. (2012). Epidemiological study of road traffic accident cases attending tertiary care hospital, in Bhopal Madhya Pradesh. *National Journal of Community Medicine.* Vol. 3(3) July-Sept. pp 395-99
9. Menon A, Pai VK, Rajeev A. (2008) Pattern of fatal head injuries due to vehicular accidents in Mangalore. *J Forensic Leg Med.* Feb; 15(2):75-7. Doi: 10.1016/j.jflm.2007.06.001. Epub 2007 Sep 27.
10. Pathak A, Desania N.L, Verma R. (2008) Profile of Road Traffic Accidents & Head Injury in Jaipur (Rajasthan). *J Indian Acad Forensic Med*, 30(1). pp 6-9