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Research Article

MEDICO-LEGAL STUDY OF HEAD INJURY AT RURAL HOSPITAL IN CENTRAL INDIA DURING THE PERIOD JANUARY 2010 TO DECEMBER 2014

Pawar VG^{1*}, Kachare RV²

¹Assistant Professor, Department of Forensic Medicine & Toxicology Swami Ramanand Teerth Govt. Rural Medical College, Ambajogai Dist Beed, Maharashtra, India

²Professor & Head, Department of Forensic Medicine & Toxicology Swami Ramanand Teerth Govt. Rural Medical College, Ambajogai Dist Beed, Maharashtra, India

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*Corresponding Author: **Vishwajeet Pawar**

Assistant Professor Department of Forensic Medicine and Toxicology SRTRCMCH, Ambajogai Dist Beed, Maharashtra Tel No. 9922086138

ABSTRACT

This retrospective study deals with the fatal cases of head injury occurring in the Central India. The study was carried out at Rural Medical College during the period January 2010 to December 2014. All consecutive cases of fatal medico-legal were included in this study. The details about the age, sex, address, brought by whom, time of admission, treatment given and time of death were noted and filled in a predesigned proforma. There were total 400 cases of fatal head injuries were studied. 84% male and 16% were females. Most of the cases 32.5% of fatal head injuries were young adults in the age group of 21-30 years. Most of the fatalities 37.5% were within 24 hours and it was worrisome that 35.5% were observed during day time as compared to night time. The occurrence of head injury cases in urban area 51.5% is slightly higher than the rural area. 91% of cases show hemorrhage under the scalp and among them linear fracture of skull bones was commonest 62.06%. The vehicles most commonly involved in vehicular accident in head injury cases are heavy four wheelers i.e 32.86. Due to combination of factors including rapid motorization, poor road traffic infrastructure as well as the behavior of the road users, the morbidity and mortality burden in the developing countries is rising.

Keywords: Head injury, Medico-legal cases, Hemorrhage, Fatal, Linear fracture, Vehicular accident Morbidity, Mortality.

INTRODUCTION

Head is frequently injured as a result of accident and criminal violence. Head injury is often serious and fatal. So it is true to say that "No form of craniocerebral injury is too trivial to be ignored or too serious to be despaired off"¹. Any type of head injury is possible by any type of force². Head injury is defined by National Advisory Neurological Disease and Stroke Council is a morbid state resulting from gross and subtle structural changes in the scalp, skull and or the contents of the skull produced by mechanical forces. The concept of mechanical force is restricted to those forces applied externally to the head thus excluding surgical ablations and intrinsic factors as increased intracranial pressure resulting edema, hydrocephalus or a mass occupying lesions due to a disease without accidental head trauma³. One of the basic aims of the medico-legal importance of examination of road traffic case is to reconstruct traffic accidents. Such examination will also help to detect "hit and run" cases. Proper examination and evaluation of traffic injuries will help us while facing the cross examination and to guide the courts towards reconstruction of whole accident¹.

Aims and Objectives:

- To determine the location, nature and effect of injuries to the skull, brain and its coverings.
- To ascertain the cause of death.
- To establish relationship between external and internal injury of skull and its contents.

MATERIALS AND METHODS

The retrospective study was carried out in the Department of Forensic Medicine and Toxicology at Swami Ramanand Teerth Govt. Rural Medical College at Ambajogai during the period January 2010 to December 2014. The study was approved by ethical committee. The information was collected from the inquest report, indoor papers, from the investigating officer concerned and relatives. The clinical records of the admitted cases were carefully studied to know the nature, extent and gravity of injury.

OBSERVATION AND RESULTS

Total 400 cases of fatal head injuries were studied, 84% were males and 16% were females. The male to female ratio was 5.2:1. Most of the cases 32.5% of fatal head injuries were

young adults in the age group of 21-30 years. Most of the fatalities 37.5% were within 24 hours and it was worrisome that 35.5% were observed during day time as compared to night time. The occurrence of head injury cases in urban area 51.5% is slightly higher than the rural area. 91% of cases shows hemorrhage under the scalp and among them linear fracture of skull bones was commonest 62.06%. In 36.63% cases parietal bone was mostly fractured followed by frontal bone 21.81% cases. If combinations of fracture of bones are taken into consideration, parieto-temporal bone 8.18% was commonly fractured. Intracranial hemorrhage was found in 380 cases out of 400 among them 37.89% cases shows subdural hemorrhage. The vehicles most commonly involved in vehicular accident in head injury cases are heavy four wheelers i.e 32.86%.

DISCUSSION

The present study shows 84% were males and 16% were females. The male to female ratio was 5.2:1. It is probable due to more male population on road because of male dominating society and majority of the males are engaged in outdoor activities than females. Similar findings were also observed in Deshpande VL⁴ and Devadiga and Jain⁵ as 4:1 and 5:1 respectively. Head injury can occur at any age. In present study 32.5% cases were in the age group of 21-30. This is due to fact that this is the most active period of life but Jannine Jagger et al⁶ and Katz Douglass⁷ shows variable age group in their study as 20-29 years which is accordance with their findings. Maximum no. of persons sustained head injury within 24 hours similar findings were observed by Walpole⁸ and Devadiga KV, Jain SP⁴ a the intracranial haemorrhages, edema of the brain which are not compatible with life can occur immediately within 24 hours of injury. The occurrence of head injury cases in urban area 51.5% is slightly higher than the rural area similar findings were observed by Mahaboob et al⁹ and John F et al¹⁰ in their study. 91% of cases show hemorrhage under the scalp and among them linear fracture of skull bones was commonest 62.06%. The present findings were in accordance with Kalyanaraman and Ramamurthi¹¹. The vehicles most commonly involved in vehicular accident in head injury cases are heavy four wheelers i.e 32.86% similar findings were observed by Karre Solheim¹² and Katie Gilbert¹³ in their studies.

CONCLUSION

We can do a lot to reduce road accidents as they are preventable. This is the time where an organized team work by people in many disciplines like education, engineering, medical laws, enforcement agencies required for effective prevention of road traffic accidents. Nationwide campaign and certain measures for education of public at large must be called for against rash driving, unawareness of traffic rules, bad conditions of roads, talking on cellular phones while driving, consumption of alcoholic beverages. Government of India has also taken matter seriously and made a high level Sunder committee.

REFERENCES

1. Mukherjee JB. Cranio cerebral injuries. Forensic Medicine and Toxicology, 1994; 1:366-69
2. Munro D. Craniocerebral injuries. Oxford University Press, 1963; 33
3. Tedeschi CG. Head and Spine, Mechanical Injury Forensic Medicine. 1977; 1: 23.
4. Deshpande VL. Analysis of Cranio-cerebral injuries- A Medico-legal autopsy study, 1976; Paper presented in conference in Bhopal.
5. Devadiga KV, Jain SP. Mortality in Head Injury, J. Ind. Med. Assoc., 1969; 52(1): 22-26
6. Jannine Jagger, Jules JL, John AJ, Reecca WR. Epidemiological features of head injury in a redominate rural population J Trauma, 1984; 24: 40-44.
7. Katz Douglass I, Alexander MP. Traumatic Brain injury Arch Neurol, 1984; 51: 661-70
8. Walpole Lewin. Factors in the mortality of closed head injuries B.M.J. 1953 June 6: 1239-42
9. Mahaboob S, Murlidhar B, Kashikar D. Head Injury and General Surgeon Ind. J. Surgery 1992:415-18
10. John FA, Jack DG, Leonard TK, Edward R. The Incidence, causes and secular trends of head trauma in Olmsted county Minnesota neurology, 1980; 30: 912-19
11. Kalyanaraman and Ramamurthi. Incidence of skull fracture, Institute of Neurology, Madras. Textbook of neurology 1973: 234.
12. Karre Solheim. Pedestrian Death in road traffic accidents. Br. Med J. 1964; 11: 81-83
13. Katie Gilbert, Mark McCarthy. Deaths of cyclist in London 1985-93 The Hazards of road traffic accidents B.M.J. 1934; 308: 1534-37

Figure 1: Showing sex wise distribution of cases

Sex	No. of Cases	Percentage
Male	336	84
Female	64	16
Total	400	100

Figure 2: Showing age wise distribution of cases

Age (Years)	No. of Cases	Percentage
<1 Year	06	1.5
1-10	36	9
11-20	28	7
21-30	130	32.5
31-40	98	23.5
41-50	48	12
51-60	24	6
61-70	22	5.5
>70 Years	12	3
Total	400	100

Figure 3: Showing area wise distribution of cases

Place of Incidence	No. of Cases	Percentage
Urban	206	51.5
Rural	194	48.5
Total	400	100

Figure 4: Showing the time lapse between injury and death

Time of Death	No. of Cases	Percentage
Death on Spot	88	22
Within 24 Hours	150	37.5
Between 2 nd -3 rd Day	90	22.5
Between 4 th -7 th Day	40	10
Beyond 7 th day	32	8
Total	400	100

Table 5: Showing fracture of skull bones

Cases having fracture of skull bones		Cases without fracture of skull bones	
No. of cases	Percentage	No. of cases	Percentage
242	60.5	158	39.5

Table 6: Showing site of fracture of skull vault bones

Site of fracture bone	No. of cases	Percentage
Frontal	48	21.81
Parietal	74	36.63
Temporal	28	12.73
Occipital	26	11.81
Parieto-temporal	18	8.18
Fronto-temporal	04	1.81
Fronto-parietal	14	6.36
Parieto-occipital	02	0.90
Fronto-parieto-temporal	06	2.71
Total	220	100

Table 7: Showing location of fracture of skull base

Fracture skull bones	No. of cases	Percentage
Anterior cranial fossa Fracture	36	19.78
Middle cranial fossa fracture	94	51.66
Posterior cranial fossa fracture	04	2.20
Anterior cranial fossa + Middle cranial fossa fracture	24	13.18
Middle cranial fossa fracture + Posterior cranial fossa fracture	0	0
All three fossa fracture	24	13.18
Total	182	100.00

Table 8: Showing Percentage of type of fracture of skull base

Type of fracture	No. of cases	Percentage
Linear	144	62.06
Comminuted	40	17.24
Depressed	06	2.58
Depressed + Comminuted	24	10.34
Depressed and sutural separation	02	0.86
Linear + sutural separation	10	4.31
Sutural separation	06	2.58
Pond	00	00
Total	232	100

Table 9: Showing the Type of intracranial haemorrhage

Type of haemorrhage	No. of cases	Percentage
Only extradural haemorrhage	16	4.21
Only subdural haemorrhage	144	37.89
Only Intracerebral haemorrhage	38	10.00
Only Intraventricular haemorrhage	10	2.63
Extradural + Sub-arachnoid haemorrhage	00	00
Subdural + Subarachnoid hemorrhage	20	5.26
Extradural + Subdural + Subarachnoid haemorrhage	126	33.15
Subdural + Intraventricular hemorrhage	06	1.57
Subdural + Intracerebral haemorrhage	04	1.05
Subarachnoid + Intracerebral hemorrhage	02	00.52
Intracerebral + Intraventricular Haemorrhage	06	1.57
	02	00.52
Subdural + Subarachnoid + Intracerebral hemorrhage	06	1.57
Total	380	100

Table 10: Showing involvement of vehicle in accident

Type of vehicle	No. of cases	Percentage
Bicycle	08	2.86
Two wheeler	72	25.71
Three wheeler	10	3.57
Light four wheeler	68	24.29
Heavy four wheeler	92	32.86
Railway	16	5.71
Unknown vehicle	14	5.00
Total	280	100

Table 11: Showing types of victims involved in head injury

Type of victim	No. of cases	Percentage
Driver	42	16.93
Pedestrian	154	37.90
Occupant	104	41.94
Pedal cyclist	08	3.23
Total	248	100

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