

A study of pattern of skull fractures in head injuries-a retrospective study of autopsies conducted at RIMS, Raichur

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Abstract

Regional injuries consist of injuries sustained to various anatomical regions of the body. Amongst regional, injury to head is more common as head being most exposed part and prominent part of body. As defined by National Advisory Neurological Disorder and Stroke council head injury is a "a morbid state resulting from gross and subtle changes in the scalp, skull and/or the contents of the skull, produced by mechanical force".¹ Commonly head injuries are observed in road traffic accidents, work place accidents, and criminal violence. Skull fractures offer varying degree of medico-legal and diagnostic problem to autopsy surgeons and clinicians. Most of the skull fractures are associated with varying degree of intracranial hemorrhages, skeletal injuries. In our study, among the skull fractures, fissure fracture was commonest type encountered. In our study, over a period of 6 months i.e January 2018 to June 2018 we had done 190 autopsy examinations of different types of cases, out which 74 cases (38.94%) showed skull fractures which is significant number. Among 74 cases of skull fractures, road traffic accidents with 51 cases were the major contributor.

Key Word: Head injury, Skull Fractures, Fissure Fracture, Road Traffic Accidents,

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INTRODUCTION

The history of trauma parallels the history of evolution of man, with his aggressive instincts, creativeness and ambitious nature to rule the nature and society in large, might have brought success to mankind but at the same time he invited many unexpected trauma/injury and accidents along with it. As the years goes, the trauma/injury and accidents had came to mainstream of

discussion compared to past, not only because of morbidity and mortality related to it but also due to various other factors like change in total approach to the treatment aspect as well as medico-legal implications. When we discuss about trauma/injury to the human body due to various reasons, the head region holds its pivot place because of severity of morbidity and mortality related to it. Polson truly said that no injury to head is too trivial to be ignored or so serious to be despaired of.² Now a day's head injury is the major shareholder of death due to road traffic accidents rapidly developing industrial countries/areas where traffic flow being heavy. The other causes of head injury are fall from height, work place accidents, blunt force trauma etc. In any case of heady injury, the injuries may be soft tissue injuries, skull fractures, intracranial hemorrhages or combination of any. In this present study, we are concentrating only on pattern of skull fractures, from various medico-legal autopsied cases during our study period January 2018 to June 2018.

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MATERIALS AND METHODS

This is a cross sectional retrospective descriptive study of autopsy reports conducted in Department of Forensic Medicine and Toxicology RIMS, Raichur during January 2018 to June 2018. The required information was gathered by inquest report, postmortem examination

report findings and hospital case sheet extract. Only those cases with head injury were included in the study, decomposed and natural death cases were excluded from the study. Special emphasis was given to head injuries and examined methodically to note scalp injuries, skull fractures, and intracranial hemorrhages.

OBSERVATION AND RESULTS

During the study period i. e January 2018 to June 2018, a total of 190 medico-legal cases were autopsied, out of which 74 cases (38.94%) showed head injury with skull fractures.

Study period	Total number of cases	Head injury with skull fracture cases	Percentage
January 2018 to June 2018	190 cases	74 cases	38.94%

Among 74 cases of head injury with skull fractures, we observed maximum cases of skull fractures in road traffic injuries (68.91%), followed by railway injuries (20.27%), assault (5.4%) and work place accidents (5.4%).

Type of case	Number of cases	Percentage
Road traffic injuries	51	68.91%
Railways injuries	15	20.27%
Assault	04	5.4%
Work place accidents	04	5.4%
Total	74	100

Among the individual skull bones fractured, occipital bone is involved in 15 cases followed by temporal bone in 7 cases, frontal and parietal bone in 6 cases each, base of the skull in 4 cases and in 2 cases we observed diastasis fracture.

Individual skull bone fractured	Number of cases
Occipital bone	15
Temporal bone	7
Frontal bone	6
Parietal bone	6
Base of skull fracture	4
Diastasis fracture	2

In our study we observed, fronto-temporal bone combined fractures in 17 cases followed by temporo-parietal bones fracture in 11 cases and in 6 cases temporo-occipital fractures were observed.

Combined skull bone fractures	Number of cases
Fronto-Temporal	17
Temporo-Parietal	11
Temporo-Occipital	6

As for as type of skull fractures are concerned, the common type of skull fracture in our study is fissure fractures (51.35%) followed by comminuted fracture (39.18%), crush injury to skull (6.7%) and diastasis fracture (2.7%).

Type of skull fracture	Number of cases	Percentage
Fissure	38	51.35
Comminuted	29	39.18
Crush injury	05	6.7
Diastasis fracture	02	2.7
Total	74	100

In our study, 26 cases (35.13%) showed head injuries with skull fractures in evening hours (6 pm-12 am) followed 22 cases (29.72%) in morning hours (6am-12pm), 20 cases (27.02%) in afternoon hours (12pm-6pm) and 6 cases (8.1%) in night hours (12 am-6am).

Time	Number of cases	Percentage
Evening hours (6 pm-12 am)	26	35.13%
Morning hours (6am-12pm)	22	29.72%
Afternoon hours (12pm-6pm)	20	27.02%
Night hours (12 am-6am)	6	8.1%
Total	74	100

In our study, we observed that maximum number of head injury cases with skull fractures in the month of January (25.6%) followed by March (22.97%), May (18.91%), February (13.51%), April (10.81%) and June (8.1%).

Month	Number of cases	Percentage
January	19	25.6%
February	10	13.51%
March	17	22.97%
April	08	10.81%
May	14	18.91%
June	06	8.1%
Total	74	100

DISCUSSION

The pattern of skull fractures in head injuries varies from studies to studies, the reason being the type of cases we frequently come across and the safety measures we take, in this part we are comparing some of the studies observations with our study. Study conducted by Thangaraju M, "Study of pathology and medico-legal aspects of cranio-cerebral injuries by blunt force" most of cases were fall from height (34%) and vehicular accidents (32%).³ In contrast to Thangaraju *et al* study, we observed more number of head injury with skull fractures in road traffic injuries (68.91%) followed by railway injuries (20.27%) and in all the 74 cases the blunt force is the cause of the injury.³ Manish K *et al* from Davangere in their study "Fatal head injuries in road traffic accidents" showed that linear fracture (38.8%) was commonest fracture followed by comminuted fracture (27.7%) and depressed fracture (11.1%).⁴ Similarly study conducted by Pathak A - Profile of road traffic accidents and head injury, the dominant type of skull fracture found was linear (fissure) fracture in 43.04% cases, followed by basilar fractures (17.73%), comminuted (7.6%) and depressed fracture (3.78%).⁵ Study conducted by Raja Rupani *et al* in their study "Pattern of skull fractures in cases of Head Injury by Blunt Force" observed fissure fracture as their commonest type of skull fracture, while others were depressed and comminuted fracture.⁶ In another study by Mukesh Goyal *et al.* observed that, out of 140 cases autopsied linear fractures were more common (77 cases) followed by fracture of base of skull (21 cases), depressed fractures (13 cases) and in 7 cases they observed comminuted fractures.⁷ Even though our study is not limited to only road traffic injuries, we observed fissure fractures as most common type of skull fracture (51.35%) followed by comminuted fractures (39.18%) Gradwohl, Campus and purchase in their study

observed that, external injuries may or may not be present in all the cases of head injuries. In contrast in our study all the head injury cases with skull fractures have external injuries.⁸ Study conducted by Raja Rupani *et al* in their study "Pattern of skull fractures in cases of Head Injury by Blunt Force" in 100 cases of intracranial lesions, 4 case sustained fracture of skull without any injury to scalp, and in 36 cases injuries of both scalp and skull were present.⁶ In our study all the 74 cases of skull fractures had one or the other form of soft tissue injury to the scalp. Study by Ravindra S Honnunar *et al* observed that, the common individual involved in head injury is frontal (56.2%) followed by parietal (46.9%), temporal bone (40.3%), occipital bone (36.4%), base of skull (22.1%) and sphenoidal bone in 14.1% cases.⁹ In contrast to Ravindra S Honnunar *et al* study, we observed individual occipital bone fracture more commonly followed by tempotal bone fracture. In a study by Ranjit M Tandle *et al* observed that, a combination of linear fracture with fracture of base of the skull (24.21%) was the commonest type of fracture.¹⁰ In contrast to Ranjit M Tandle *et al* study we observed, fronto-temporal bones combined fractures more commonly followed by temporo-parietal bone fractures.

CONCLUSION

The incidence of head injuries are increasing day by day, uncontrolled surge in vehicular movements, not following traffic rules, not wearing helmets while riding two wheelers, standing near the doors in trains and not following proper safety measures at work place are the reason behind these avoidable deaths. So it is very necessary to increase as well as update the knowledge about both treatment and medico-legal aspect of head injury because many of such cases can be preventable if

proper safety measures are taken and curable when these cases get immediate and appropriate treatment in time.

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