

Radiological Study of Pattern of Intracranial Haemorrhages and Skull Fractures in Fatal Head Injury

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ABSTRACT

BACKGROUND: India in last few years have grown in leaps and have undergone major economic and demographic transition coupled with increasing urbanization and motorization. Among the top ten causes of mortality in the country, Road traffic accidents was one among the tenth cause. But with the increasing urban expanse and lifestyle changes, it is projected that road traffic accidents will occupy the second position in the list of major killers among the causes of disease burden in this century. Road accidents are one of the leading cause of death globally and mainly occurs in the age group of 15 to 49 years.

METHODS: This cross-sectional study was carried out in 120 cases being brought in the casualty of Travancore Medical College, Kollam, from July 2023 to December 2023. A detailed data of sociodemographic profile, type of skull fractures and type of intracranial hemorrhages were noted.

RESULTS: The maximum cases (30.9%) were in the age of 31-40 years (37 cases); followed by 31 cases (25.9%) from the age group 41-50 years. The mean age of the patients was 33.24 (SD14.66) years. Linear fractures were the commonest type of skull fracture which were seen in 48 cases (40%), followed by comminuted fracture in 12 cases (10%) and depressed fracture in 2 cases (1.7%). Subdural hemorrhage was the commonest intracranial hemorrhage, seen in 58 cases (48.3%), followed by subarachnoid hemorrhage in 48 cases (40%).

KEYWORDS: Skull fractures; Intracranial hemorrhages; Road traffic accident.

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INTRODUCTION

India in last few years have grown in leaps and have undergone major economic and demographic transition coupled with increasing urbanization and motorization. Among the top ten causes of mortality in the country, Road traffic accidents was one among the tenth cause of mortality but with the increasing urban expanse



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and lifestyle changes, it is projected that road traffic accidents will occupy the second position in the list of major killers among the causes of disease burden in this century. Road accidents are one of the leading cause of death globally and mainly occurs in the age group of 15 to 49 years. During the calendar year 2022, road crashes in India claimed about 1.68 lakh lives and caused injuries to more than 4.4 lakh people.¹ Among all the regional injuries, the injury to the head and neck are the most important in forensic practice which may or may not be representative of the extent of the internal injury as head injuries provide the major contribution of the death due to assaults, falls and transportation accidents. Road traffic injuries are the leading cause of traumatic brain injuries. CT scan is commonly used as the initial diagnostic tool to look for various kinds of lesions in cases of head injury and that CT scan might play an ever-increasing role in forensic neuro-traumatology, this study was carried out to analyse the significance of nature of injury, most common skull fracture involved and also the pattern of intracranial haemorrhages.

MATERIALS AND METHODS

This cross-sectional study was carried out in 120 cases of head injury followed by road traffic accidents being brought to the casualty of Travancore Medical College, Kollam, from July 2023 to December 2023. A detailed data of sociodemographic profile, CT study of skull fracture and type of hemorrhage were noted.

Statistical Analysis

The data was analyzed using SPSS software version 16. Descriptive statistics like mean and percentages were used to interpret the results. The chi-square test was applied and a p-value of 0.05 was considered as statistically significant.

RESULTS

A total of 120 cases were included in this study.

Table 1: Age wise distribution of study subjects

Age (Years)	Cases	Percentage
11-20	4	3.3
21-30	27	22.5
31-40	37	30.9
41-50	31	25.9
51-60	16	13.3

Table cont....

>60	5	4.1
Total	120	100

Out of 120 subjects enrolled into the study, maximum cases (37 Cases-30.9%) were in the age of 31-40 years, followed by 31 cases (25.9%) from the age group 41-50years. The mean age of the patients was 33.24 (SD14.66) years.

Table 2: Sex wise Distribution of study subjects

Sex	Cases	Percentage
Male	72	60
Female	48	40
Total	120	100

In our study, 72 cases (60%) were males and (40%) were females, males were more prone to head injuries in road traffic accidents since they are more into outdoor activities like driving vehicles, working outdoor posing them risk due to accidents. Females succumbed to road traffic accidents were mainly because they are being pillion riders and pedestrians.

Table 3: Distribution of Cases According to Types of Fractures of the Skull

Fracture	Cases	Percentage
Intact	57	47.5
Fissured	48	40
Comminuted	12	10
Diastatic	1	0.8
Depressed	2	1.7
Total	120	100

In our study, linear fractures were the commonest type of skull fracture which were seen in 48 cases (40%) followed by comminuted fracture in 12 cases (10%) and depressed fracture in 2 cases (1.7%). In 57 cases skull bone was intact without any fractures.

Table 4: Distribution of Cases According to Intracranial Haemorrhages

Intracranial Haemorrhages	Cases	Percentage
Subdural	58	48.3
Subarachnoid	48	40
Extradural	14	11.7
Intracerebral	7	5.8
Intraventricular	6	5
Brainstem	2	1.7

Subdural hemorrhage was the commonest intracranial hemorrhage seen in 58 cases (48.3%), followed by subarachnoid hemorrhage in 48 cases (40%), extradural hemorrhages were seen in 14 cases (11.7%), intra cerebral hemorrhage in 7 cases (5.8%), intraventricular hemorrhage in 6 cases (5%)

and brain stem hemorrhage in 2 cases (1.7%).

DISCUSSION

According to WHO estimates, young adults aged between 15 and 44 years account for 59% of global road traffic deaths and 77% of the victims are men.² The most vulnerable victims were in the 31-50 years age group and males were the most commonly involved in road traffic accidents which was consistent with the studies done by Kanchan T *et al*³ and Goyal M *et al*⁴ which concluded that the maximum cases were in the same age group and more common in male sex. Linear fracture or fissured fracture were the commonest type of skull fracture followed by comminuted fracture in road traffic accidents which was in accordance with the study done by Rupani R *et al*⁵ and Jacobsen *et al*⁶ and this may be attributed to the fact that the mechanism of most road traffic accidents exposing the fronto-temporal region to risk of trauma than the parieto-occipital region. Subdural hemorrhage was the commonest intracranial hemorrhage encountered followed by

subarachnoid hemorrhage which was in accordance with the study done by Jacobsen *et al*⁶ and Kumar A *et al*⁷ who concluded that the subdural hemorrhage was the commonest hemorrhage encountered in road traffic accidents.

CONCLUSION

From this study, we can conclude that Road traffic accidents causing head injury is the gravest risk to mankind in the coming years ahead due to urbanization for which national level registry should take appropriate steps to control the accidents and modifiable risk factors like use of helmet, no mobile usage while driving and strict traffic discipline should be maintained.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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