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Study of pattern of fatal intracranial hemorrhages

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ABSTRACT

Introduction: *A lot of incidents related to the head region could lead to death, but for simplicity's sake, these incidents are mainly of two broad categories- either non-traumatic (natural) or traumatic (violent). Of all the regional injuries, those of head and neck are found to most common and most important.* ***Material and methods***: *In autopsy room Grant Govt. Medical College Mumbai, more cases with intracranial hemorrhages brought for autopsy compared to other medico-legal cases. The present study was conducted over such fatal intracranial hemorrhage cases at Grant Govt. Medical College & Sir J. J. Hospital Mumbai over the period of five months from 1st Jan 2017 to 31st May 2017. Total 100 autopsies were conducted during study time out of which 80 cases of males and 20 cases of females of fatal intracranial hemorrhage were observed and studied in detail.* ***Result***: *The post-mortem study revealed that males were outnumbered than female and highest number being in the age group of the 21 -40 years. Road traffic accidents 37 cases (37%) were responsible for most of them, followed by accidental fall 19(19%), homicidal assault deaths were recorded as the 8 cases (8%).* ***Conclusion***: *Blunt crania-cerebral trauma was the predominant cause of death identified in this study. In natural causes hypertension was the most common cause of intra-cranial hemorrhage. Intracranial hemorrhage was less in death due to drowning and still birth.*

Keywords: *Head injury; fractures skull; road traffic accident.*

INTRODUCTION

Intracranial hemorrhage is one of the major causes of death today in both natural and un-natural cases. If the bleeding is small thin layered it is called hemorrhage and if it is large and space occupying then it is called hematoma.[1] There are many reasons for intracranial haemorrge of which most common being head injury.[2] Most common cause for head injury in India is road traffic accident followed by fall from hight.[3] Cranio-cerebral injuries or head injuries were one of the most important regional injuries, known to human beings since history. A vehicular accident constitutes mainly two-wheeler accidents as two-wheeler constitutes main vehicle fleet in India.[4] Head is most common site injured in road traffic accident as it is the most prominent and vulnerable part of human body by virtue of its situation and to sustain serious and fatal injuries owing to the great risk of striking the head. Two-wheeler riders especially of scooter are more prone to develop head injury than another victim. The application of blunt force to the head may result in injury to the contents of the skull, either alone or with a fracture of the skull. The extent and degree of an injury to the skull and its contents is not necessarily proportional to the amount of force applied to the head.[5] The aim of present study is to find out the reasons behind Intra-cranial hemorrhages, pattern of different hemorrhages and fractures observed during autopsy. Association of alcohol and other drug addiction with intracranial hemorrhage and fatal head injury was also touched in this study.

This study has aimed to assess the reasons of intracranial hemorrhages in subjects of Mumbai region and also to manner of death.

MATERIALS AND METHODS

The study was performed on 100 cases referred to the Grant

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Govt. Medical College and Sir J.J. Group of Hospitals, Mumbai within the period from 1st January 2017 to 31st May 2017. Complete routine autopsies were carried out for all cases with a thorough external and internal examination. Various identification data of the victims, like age, sex, religion, along with place of incidence and time were noted from inquest report accompanying dead bodies. Digital photography was used for some interesting cases. Tissue specimens were sent for histopathology and Viscera samples were drawn for alcohol and toxicology.

RESULT

A total 100 post mortem cases were studied. Among them 80% were males and 20% were females. Highest numbers of death due to intra cranial hemorrhage victims were due to road traffic accidents that is (37%), followed by fall (19%), followed by railway accident (13%) and Illness (11%) (**Table 1**). Total number of deaths due to natural causes of intracranial hemorrhages was 23% and unnatural causes were 77% (**Figure 1 and 2**).

In males Intracranial hemorrhage following head injury due to road traffic accident was present in 35% cases, in 15% cases due to fall, in 12% cases due to railway accident, in 4% cases due to assault, and in natural causes it is present in 6% cases due to illness and 4% cases due to hypertension (**Figure 2**).

Table 1 Different reason for ICH

Reason	Frequency
RTA	37
Fall	19
Illness	11
Not unknown	1
Railway accident	13
Assault	8
Hypertension	7
Animals	2
Drowning	1
Still birth	1
Total	**100**

In females Intracranial hemorrhage following head injury due to road traffic accident was present in 2% cases, in 4% cases due to fall, in 1% cases due to railway accident, in 4% cases due to assault, and in natural causes it is present in 5% cases due to illness and 3% cases due to hypertension (**Figure 2**).

As compare to females in males causes of intracranial hemorrhages 68% were unnatural and 12% were natural and in females 9% were unnatural and 11% were natural.

In this study it was seen that under scalp contusion in death due to intracranial hemorrhage was found in 67% in males and 11% in females. In total 78% cases under scalp contusion was found. Extra-Dural hemorrhage was found in total 15% cases of which 14% in males and 1% in females. Subdural

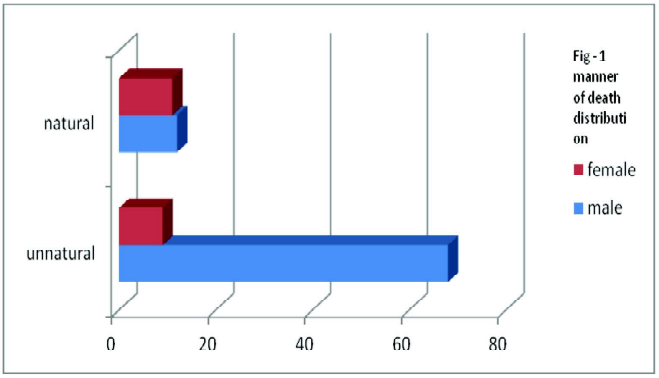

Figure 1 Manner of death distribution

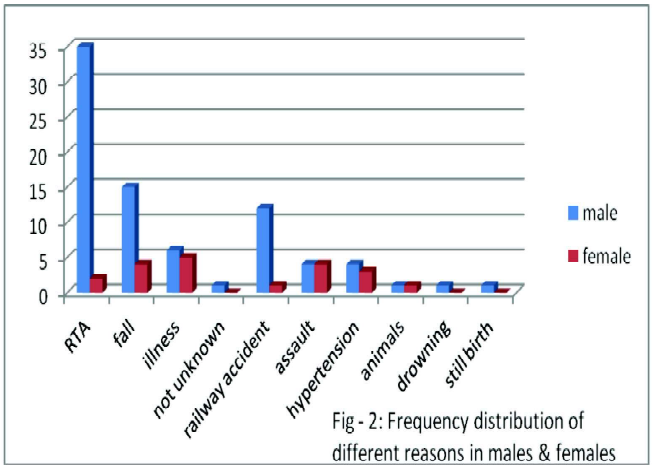

Figure 2 Frequency distribution of different reasons in males & females

hemorrhage was found in total 63% cases of which 53% in males and 10% in females. Subarachnoid Hemorrhage was found in total 74% cases of which 63% in males and 11% in females. Intra-cerebral hemorrhage was found in total 18% cases of which 13% in males and 5% in females.

Table 2 Intra-ventricular hemorrhage

	Intra-ventricular hemorrhage	
Sex	yes	No
Male	5	75
Female	5	15
Total	10	90

From **Table 2** it can be seen that under Intra-ventricular hemorrhage was found in total 10% cases of which 5% in males and 5% in females.

Table 3 History of addiction

	History of addiction			
Sex	**No addiction**	**Alcohol**	**Tobacco**	**Drugs**
Male	55	22	2	1
Female	20	0	0	0
Total	75	22	2	1

From **Table 3** it can be seen that history of addiction was found in total 25% cases which is found only in males and not in females. In this most common addiction was alcohol found in 22% males.

Table 4 Relation between drug addiction and different intracranial hemorrhage

	Extra-dural hemorrhage	Subdural hemorrhage	Subarachnoid hemorrhage	Intracerebral hemorrhage	Intraventricular hemorrhage
History Of Addiction	yes	Yes	Yes	yes	Yes
No Addiction	10	46	53	14	7
Alcohol	4	14	19	3	3
Tobacco	1	2	1	1	0
Drugs	0	1	1	0	0
Total	15	63	74	18	10

From **Table 4** it can be seen that history of alcohol addiction was seen in 4% cases in extradural hemorrhage, in 14% cases in subdural hemorrhage in 19% cases in subarachnoid hemorrhage and in 3% cases each in intracerebral and intraventricular hemorrhages. History of tobacco addiction was seen in all except in intra-ventricular hemorrhage. History of drug addiction was seen in subdural and subarachnoid hemorrhage.

Table 5 Most common age group in all types of intracranial hemorrhages.

	Under scalp contusion		Extradural hemorrhage		Subdural hemorrhage		Subarachnoid hemorrhage		Intracerebral hemorrhage		Intraventricular hemorrhage	
Age group	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
<20	8	1	0	9	4	5	6	3	2	7	0	9
21-40	37	7	8	36	32	12	36	8	5	39	3	41
41-60	23	6	6	23	19	10	22	7	5	24	2	27
61-80	5	7	1	11	7	5	5	7	5	7	3	9
> 81	5	1	0	6	1	5	5	1	1	5	2	4
Total	78	22	15	85	63	37	74	26	18	82	10	90

From **Table 5** it can be seen that under scalp contusion, Extra-Dural hemorrhage, Subdural hemorrhage and Subarachnoid hemorrhage were most commonly seen in age group 21-40 years? Intra-cerebral hemorrhage was found commonly in age group 21-40, 41-60 and 61-80 years. Intra-ventricular hemorrhage was found commonly in 21-40- and 61-80-years age group.

In this study it was found that fracture of skull was found in 7% cases in extra-dural hemorrhages, in 26% cases in sub-dural hemorrhages, in 33% cases in subarachnoid hemorrhages, in 5% cases in intra-cerebral hemorrhages and in 2% in intraventricular hemorrhages.

DISCUSSION

Road traffic accident was the most common mode of the fatal head injury. The overall increase in vehicular traffic to the roads is responsible for automobile accidents being the most common mode of fatal injury. Similar findings were noted down in other studies.[5] In present study, linear fracture of skull was the commonest type of skull fracture. Pathak, Vyas and Menon found the similar findings.[6-9]

In this study, Males clearly outnumbered females with male to female ratio as 4:1. Similar findings were observed in other studies such as Kumar, Patil and Shivkumar.[10] In the age group analysis of the victims, maximum incidence was in age group of 21 years to 40 years and least in group less than 20 and more than 80 years. Similar findings were observed by Kumar, Patil and Shivkumar's studies.[10] This high prevalence of fatal head injury in young age group is because of social and physical activeness of individual from this age group. And they were either students or serviceman who wants to remain outside home and travel through vehicle most of the time.

Hypertension was the most common cause of intra-cranial hemorrhage in natural causes of death. Total deaths due to natural intracranial hemorrhage are 18%, of which 7% are due to hypertension. Scalp injury with skull fracture along with intracranial hemorrhage was the most common presentation of head injury. These findings correlate with the other studies done by Patil and Waz.[11] On autopsy smell of alcohol was perceived in 22% cases. We preserved viscera for chemical analysis in suspected cases. But the reports of such cases are awaited till date. So alcohol contribute as a major risk factor while driving a car or riding motorcycle. In 2% cases tobacco addiction and in 1% cases another drug addiction was present.

CONCLUSION

The current study was conducted and the data generated were compared in almost all respects with the studies conducted by previous researchers, which recognized males were prone to having fatal head injury and road traffic accidents as the predominant cause of fatal head injury due to blunt trauma and its fallowed by fall from height as second common cause of intra cranial hemorrhage. Blunt cranio-cerebral trauma was the predominant cause of death identified in this study. These fatalities could be avoidable. In natural causes hypertension was the most common cause of intra-cranial hemorrhage. Intracranial hemorrhage was less in death due to drowning and still birth.

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