

Head Injury and its Consequences – a One Year Study in Karachi

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ABSTRACT

Objective: Head injuries are a major cause of mortality or disability among the youth of the nation. This study was conducted to determine the causes of head injuries in Karachi and its implications on individuals.

Study Design: Prospective observational Study.

Place and Duration of Study: This study was performed at the Emergency department of Jinnah Post Graduate Medical Centre (JPMC), Karachi from January 2013 to December 2013.

Materials and Methods: The study included 1,59,600 cases of head injury (expired or alive) brought to the emergency department of JPMC.

Results: Major Head injuries accounted for 42% of the total injury cases. Majority of the head injury cases belonged to the male segment of the society (73%) with ages ranging from 20 years – 39 years (54%). The leading cause of head injury was found to be Road traffic accidents(RTA) (43%). While analysing the outcomes of head injuries, it was found that the death rate for head injuries was 40%. This encompasses the patients that expired during or after treatment as well as the dead brought to the hospital.

Conclusion: The mortality rate due to head injuries is escalating day by day. Road traffic accidents account for majority of these cases. Steps need to be taken to control fatal head injuries by adopting effective preventive measures like traffic control and management, rapid response to accidents, effective and efficient handling of cases in hospital emergencies.

Key Words: Head Injury, Mortality Rate, Road Traffic Accidents, Karachi.

INTRODUCTION

The number of reported cases of head injuries in Karachi are increasing on daily basis. Majority of the cases endure serious repercussions. Head injuries are considered to be very expensive in terms of lives lost, efficiency losses, and health care expenses¹. Karachi is Pakistan's cosmopolitan city and is considered to be the economic hub of the country. Unfortunately, the rate of accidents and fatalities associated with it pose a massive liability on the economic framework of the country. Head injury is considered to be serious if the brain gets affected, otherwise the injury is expected to be a simple one. Head injury can be either closed head injury (Dura remains unbroken) or open head injury (Dura is damaged or torn). Higher prevalence rate of post-traumatic epilepsy has been found in open head injury survivors in comparison to closed head injury². With reference to death rate, studies show that subdural haematoma (SDH) and diffuse axonal injury (DAI) are the two worst forms of head injury. In SDH the major injury occurs to surface blood vessels whereas in DAI the key mechanical impairment occurs to the brain itself³. Diffuse axonal injury (DAI) is termed as a condition where damage to the brain can either be primarily functional (e.g. in concussive injuries) or structure based (e.g. in extended traumatic coma not related to mass lesions).^{4, 5}

There are multiple causes of head injuries, for instance, road traffic accidents (RTA), falls, attacks, sports accidents, horse-riding accidents⁶, domestic violence, etc. The causes of injuries to the head vary on the basis of age. For example, in young children, falls are found to be the major cause of head injury^{7, 8}. In contrast, some studies debate that RTAs are the most common cause of head injury in children and falls hold the second place^{9, 10}. Overall, road traffic accidents remain the foremost source of head injuries among all age groups¹¹ and are a key challenge for the concerned authorities¹².

Head injuries can be fatal resulting in the death of the patient. Studies have found that majority of the deaths in accidents have been due to head injuries^{13, 14} or head trauma¹⁵. A study carried out in Karachi revealed that 66.4% of reported deaths were a result of head injuries¹⁶. Age can also influence the survival rate of major head injuries. According to a study, in case of traumatic brain injury (TBI)¹⁷ and diffused brain swelling due to head injuries, the mortality rate is greater in the elderly population at all levels of head injury¹⁸.

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MATERIALS AND METHODS

This prospective study was carried out in the Emergency department of Jinnah Post Graduate Medical Centre (JPMC), Karachi. The hospital is commonly known as Jinnah Hospital. It was established in 1959 and is the largest public sector hospital in the city. On an average, JPMC handles approximately 3,80,000 emergency cases per annum. Out of these, 60% cases are of injuries and RTAs. This study was performed from a period of January 2013 to December 2013.

In this study, all the cases of head injury brought to the emergency (expired or alive) were included. Formal approval to carry out this study was taken from the hospital authorities. Consent was also taken from the patients or their relatives and they were ensured that confidentiality will be maintained and names will not be revealed.

RESULTS

It was found that out of a total of 2,28,000 injury cases, 70% (n=1,59,600) of the cases were of head injuries (both minor and major). 42% of the reported cases were of major head injury while 58% of the cases were of minor head injury (Table No. 1).

Table No. 1: Distribution according to level of head injury (n= 159600)

	No. of Cases	%age
Major Cases	67032	42.00
Minor Cases	92568	58.00
Total	159600	100.00

Most of the cases were of males, 73% (Table No. 2) with the maximum number of people in age groups of 20-29yrs (26%) and 30-39yrs (28%) (Table No. 3). The findings in Table No. 4 show the %ages of different factors responsible for head injury. Road Traffic Accidents (RTA) is the most prominent factor resulting in 43% of the head injuries. The other factor that contributes to 20% of head injuries is falls and is mostly related to children or the elderly people. Domestic violence is another prominent factor causing 15% of the head injuries. These head injuries are associated with the females of the society. Table No. 5 demonstrates the %ages of outcomes of head injuries.

Table No. 2: Distribution of cases of head injury on gender basis (n=159600)

Sr. No.	Gender	No. of Cases	%age
1.	Male	116508	73.00
2.	Female	43092	27.00
	Total	159600	100.00

According to this study, 13% of the Head injury patients were brought dead to the hospital, 27% of the people expired during treatment, 8 % of the people faced disability issues after treatment. Psychological

sequelae after treatment were experienced by 2% of the patients while 49% of the patients were discharged from the hospital after successful treatment.

Table No. 3: Distribution of cases of head injury on the basis of age (N=159600)

Sr. No.	Age (years)	No. of cases	%age
1.	0-9	12768	8.00
2.	10-19	15960	10.00
3.	20-29	41496	26.00
4.	30-39	44688	28.00
5.	40-49	22344	14.00
6.	50-59	12768	8.00
7.	>60	9576	6.00
	Total	159600	100.00

Table No. 4: Distribution of cases on the basis of cause of head injury (N=159600)

Sr. No.	Cause of head injury	No. of Cases	%ages
1.	RTA	68628	43.00
2.	Falls	31920	20.00
3.	Assault	19152	12.00
4.	Domestic Violence	23940	15.00
5.	Others	15960	10.00
	Total	159600	100.00

Table No. 5: Distribution of cases on the basis of outcome (N= 159600)

Sr. No.	Causes of HI	No. of Cases	%ages
1.	Discharged on completion of treatment	79800	50.00
2.	Expired during treatment	43092	27.00
3.	Brought dead	20748	13.00
4.	Psychological sequelae	3192	2.00
5.	Disability	12768	8.00
	Total	159600	100.00

DISCUSSION

Results of the study show that majority of the head injury victims are males. This result is consistent with previously carried out researches^{19, 20}. The large ratio of male sufferers has a significant negative impact on the socioeconomic conditions of the society. Males have to be in direct contact with the outside world. In most of the cases in Pakistan, they are the bread winners of their homes. In doing so, they have to travel a lot which exposes them to the brutal city traffic as well as the dangers of assaults, robbery and other attacks. In

addition, majority of the labourers and masons belong to the male segment of the society. Falls from heights or other workplace injuries are common among them. According to the age distribution chart (Table No. 3), majority of the head injury cases belonged to the age group of 20-39 years. The working class of the society belongs to this age group.

The different causes of head injury have also been determined along with their ratio of occurrence. RTA is the most dominating factor among all other causes of head injury. In case of RTAs, fatal head injuries are most common in motorcyclists who do not wear helmets. This can result in skull injuries. Base skull injuries are more serious or deadly. It should be noted that majority of RTAs result in fatal head injuries causing the death of the person²¹ or severe disability²². The ratio of RTAs resulting in mortality in Pakistan is high according to the international organisation's standards²³ and needs to be controlled. Keeping in view these serious implications of head injuries due to road traffic accidents, they should be addressed as a public health and safety precedence²⁴.

The outcomes of head injuries in this study range from mortality to full recovery. The results show that 13% of the people with head injury have already expired when brought to the hospital whereas 27% died during or after the treatment. These high mortality rates are due to the sensitivity of brain and head region. This study suggest that 8% of patients experience disability after treatment. This figure is somewhat vague as the possibility is that disability symptoms occur after some time and patient does not report them to the same hospital. Due to this, it can be inferred that the results for disability are debatable. In addition, research shows that teenagers with obvious minor head injury can have disabling symptoms after many years of injury²⁵. These cases remain unreported. Same is the case with reporting of psychological issues. A wide range of psychological problems occur after the treatment of head injuries that are not reported to the hospital. Especially, children take a lot of time to come out of the trauma. In some cases, the bad experience might haunt them for many years.

It is apparent that head injury, even a minor one can cause a lot of distress for the individual. Major Head injury on the other hand is mostly fatal or leads to severe disability. These serious repercussions can have damaging impacts on the social and economic conditions of a country. Especially in case of developing countries like Pakistan, the escalating mortality rates and disability rates of young males can create a huge vacuum. In order to control this hazard,

policies need to be devised at all levels and areas including traffic control and management, rapid response to accidents, effective and efficient handling of cases in hospital emergencies, proactive psychological counselling of patients etc. This study holds significance as for devising a solution it is imperative to first understand the causes, intensity and outcomes of the problem²⁶.

CONCLUSION

The mortality rate due to head injuries is escalating day by day. Road traffic accidents account for majority of these cases. Steps need to be taken to control fatal head injuries by adopting effective preventive measures like traffic control and management, rapid response to accidents, effective and efficient handling of cases in hospital emergencies..

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