ORIGINAL ARTICLE

Patterns of Motorbike Accidents Related Head Injuries in Patients Presenting to a Tertiary Care Hospital of Peshawar

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ABSTRACT

Objective: *To determine the different patterns of motorbike related head injuries in patients presenting to a tertiary care hospital of Peshawar.*

Materials and Methods: *It was a prospective (observational) study, which was conducted at the Neurotrauma ward of Neurosurgery department, Lady Reading Hospital, Peshawar from January 2016 to June 2016. Total number of patients were 246. We included those patients who were having impaired Glasgow Coma Scale (GCS), danger signs and having some abnormal findings on CT brain. We excluded those patients who were having GCS 15/15 and those patients of head injury having associated co-morbid conditions.*

Results: *There were 230 (93.49%) males and 16 (6.5%) females. Age range was 1 to 80 years. Majority of patients were drivers (55.28%). Only 6 (2.43%) drivers used helmet. Ninety patients (36.58%) had an ICU stay of more than one week. Seventy six (30.89%) patients were operated and 170 (69.1%) patients were treated conservatively. Mortality was 14.63% in our study.*

Conclusion: *Majority were males in our study, most of the patients who sustained head injury in motorbike accidents were drivers. Thirty six percent of the patients needed ICU stay of more than 1 week. Maximum of the patients needed conservative treatment.*

Keywords: *Road Traffic Accidents, Head Injury, Motorbike Accident.*

Abbreviations: *RTAs: Road Traffic Accidents. LOC: Loss of Consciousness. GOS: Glasgow Outcome Score.*

INTRODUCTION

Road traffic accidents (RTAs) are the major cause of diseases and mortality throughout the world, particularly in the developing countries.[1-3] It is ranked ninth globally among major causes of disability and will be the third leading cause by 2020.[4] It is estimated that more than 1 million people were killed in road traffic accidents and more than this were injured (approximately 300 deaths/ day).[5] With increasing motorization in developing countries, it will be a major health problem in the near future.[6-8] Injuries from RTAs results in major financial losses and productivity loses and leaves an astonishing effect on patients and their families. The effects of road traffic injuries are more in developing countries as compared to developed countries.[9,10]

A study done in Singapore and Vietnam concluded higher proportion of motorbike related injuries of 49.1% and 62% respectively, while in Nigeria Madubuze and Labinjo reported 54% crash injuries.[11-14] In Pakistan road traffic accident related injuries are the 5th leading cause of loss of healthy life and second important cause of disability. In Pakistan, mortality rate from RTAs is 4 – 5/million population and 15/ million vehicles. Non lethal injuries are reported to be 200/100,000 population in major cities of Pakistan including Peshawar. There is a drastic increase in number of motor bikes across the province and especially in Peshawar. During the last decade the number of registered and unregistered vehicle increased up to

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5 folds which is the major cause of congestion on the roads and ultimately leading to increase number of road traffic accidents. There is 14 fold increases in RTAs in Pakistan.[15]

Motor bikes need quick decisions as he has to respond quickly to stop or to turn a side in case of bad roads.[16,17] Increase in the number of two wheel rides are associated with increased number of injuries and deaths. They are more prone to head and spine injuries. Most of the bike riders are young people and usually they tend to adopt risky attitudes and behaviors, they also do not use helmet due to which there is an increased risk of head injuries.[18] The increasing risk of accidents and associated injuries depends on patients' age, passenger type, attitude and behavior of rider, use of helmet and road condition.[19-21] The main reason behind increasing number of RTAs is due to increase in number of motor bikes, it's easy availability on installments, poor law enforcement, and non use of safety measures by the passengers and poor road infrastructure.[21,22]

There is lack of published data on motorbike related injuries specially the head and spine injuries. The two departments involved in the recording of data are the police department and hospital. There is always discrepancy in publication of data by either of the department.[23-25] Findings of our study will help in highlighting the issue and will enable the policy makers to formulate laws that will minimize mortalities and morbidities associated with motor bike injuries.

MATERIALS AND METHODS

A prospective study was done for duration of 6 months from January 2016 to June 2016 at neurotrauma ward of Neurosurgery department, Lady Reading Hospital, Peshawar. A total number of 246 patients were studied.

Inclusion Criteria

All those patients who were having impaired GCS with danger signs and having some abnormal findings on CT brain. Both genders were included irrespective of their age. Pedestrians were also included in the study.

Exclusion Criteria

All those patients who were having associated comorbid conditions, like diabetes, hypertension, ischemic heart disease and patients on anti-platelet drugs.

Protocol

All patients were examined by ATLS (Advanced trauma life support) protocol and were stabilized in the trauma room. After resuscitation a detailed history was obtained and a pre designed proforma was filled that included patients age, gender, passenger type, use of helmet, arrival GCS and other associated non neurological injuries.

After history and examination patient were subjected to investigations that included C.T scan brain with bone window, Digital X-ray cervical/ thoracic/lumbar spine followed by MRI or 3-D CT of the affected part of the spine.

Head injury was classified as mild, moderate and severe on the basis of GCS, GCS 13 – 15, 9 – 12, and less than or equal to 8 respectively. Danger signs like, post head injury amnesia, Loss of Consciousness (LOC) > 20 min, seizures and vomiting were also included. Patients with normal GCS having no danger signs and normal CT brain were discharged from neurotrauma without admission.

RESULTS

A total of 246 patients were included in the study. Results were analyzed using SPSS version 20. Males were 230 (93%) and females were 16 (7%). Age was divided in 8 groups (Table 1). Among the affectees the drivers were 136, back seaters were 72 and pedestrian were 38. Regarding the use of helmet 6 patients were having helmet, 200 were having no helmet and about 40 patients there is no idea of helmet use. Patients were referred from other hospitals as well and some came directly to the neurotrauma department (Table 2). Frequency of head injury type is shown in table 3.

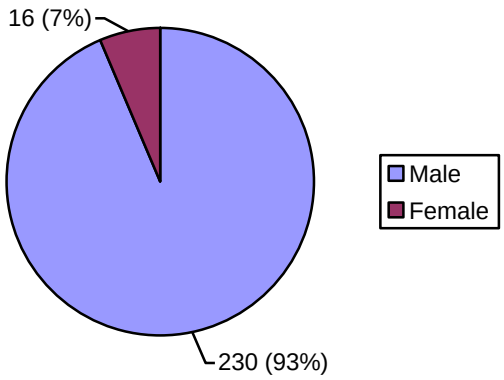

Fig. 1: *Gender Distribution.*

Table 1: *Age Distribution.*

Age Group (Years)	Number of Patients	Percentage
1 – 10	22	8.94%
11 – 20	86	34.95%
21 – 30	54	21.95%
31 – 40	24	9.75%
41 – 50	18	7.31%
51 – 60	14	5.69%
61 – 70	4	1.62%
71 – 80	2	0.81%
Total	246	100%

Table 2: *Patient's Address.*

Location	Approximate Distance (KM) & time (min) From LRH, Peshawar	Frequency
Bajawar	173/192	6
Bannu	218/221	6
Bunir	134/165	12
Charsadda	31/32	18
Chitral	326/561	4
Dir (upper)	213/307	12
Hangu	112/150	4
Karak	141/156	16
Kohat	74/98	12
Khyber Agency	32/55	4
Malakand (Chakdara)	103/149	10
Mardan	60/60	46
Nowshehra	9/50	8
Swabi	98/72	6
Swat (Saidu Shareef)	141/212	12
Peshawar	5-10/30	74

CT scan findings are shown in Table 4.Patient with associated spine injuries were 16 and those having long bone injuries were 18. Thirty-six patients died in our study, 90 patients had an ICU stay of more than one week. Seventy-six patients were operated and 170 patients were treated conservatively. Glasgow out-come score is shown in Table 5.

Table 3: *Frequency of Head Injury Type.*

Type of Head Injury	GCS	Frequency
Mild	13 – 15	20.32% (50)
Moderate	9 – 12	37.39% (92)
Severe	3 – 8	42.27% (104)

Table 4: *CT Scan Findings.*

CT Brain (with Bone Window) Findings	Frequency
Depressed skull fractures	7.3% (18)
Subdural hematomas	13.82% (34)
Epidural hematomas	23.57% (58)
Contusions	25.60% (63)
Traumatic Subarachnoid hemorrhage	18.29% (45)
Pneumochpalaus	13% (32)
Brain edema	48.70% (120)

Table 5: *Glasgow Outcome Score.*

Glasgow Outcome Score (GOS)	Frequency
1	12.19%(30)
2	5.28%(13)
3	12.60%(31)
4	24.39%(60)
5	45.52%(112)

DISCUSSION

Head injuries are the most common injuries related to motor bike injuries. Road traffic accident is considered as "silent epidemic" of the industrialized world.[26] Traumatic brain injuries are the hallmark of road traffic accidents specially related to motor bikers those

who are non-helmeted. Loss of consciousness and amnesia after trauma are the two main markers of severity of brain injury, but for ease it has been classified into three grades on the basis of GCS at presentation. Mild is the one having GCS 13 – 15, moderate having GCS 9 – 12 and severe having GCS 3 – 8. Patients with GCS more than 13 are debatable to be included in the traumatic brain injury sub group but studies have shown that there are increased chances of abnormal radiological findings in such people.[27,28] In our study we also had a significant number (20.32%) of patients in the mild sub group who were having abnormal CT brain findings.

We found that males are the predominant victims of neurosurgical traumas and those in second and third decade are mostly affected.[29,30] Regarding the age of the patient, the prevalence of traumatic brain injuries are more in two decades, so it represents a bimodal pattern. One peak is in the second and third decade and another in the 6th decade after 65 years of age, but in our study we found that the prevalence is more in second decade which is consistent with the previous study findings and it is followed by third decade and 4th decade. It represents that mostly the younger group of population which are from11 years to 40 years are mostly affected.[31] A study done in Karachi shows similar results with our studies. They also reported a high incidence in third decade of life. Likewise Jooma et al[32] & Raja et al[33] conducted two different studies and concluded that second and fourth decade are mostly affected groups.

The average time duration to reach the hospital trauma unit was approximately 3 hours; most of the people were brought from far flung areas without any special ambulance (having no ventilator facility) and even in private vehicles, this result in the delay of delivering first aid services and urgent surgical intervention if needed.[34]

Road traffic accidents are the most common cause of traumatic brain injuries which may be attributed towards traffic congestion, lack of traffic rules and regulations. There is an upsurge of motorization in Pakistan which has led to increased number of deaths due to road traffic accidents.[35] Naddumba[36] and Okeniyi et al,[37] reported that pedestrians are majority of victims affected and we found 15.44% pedestrians to be affected. It is due to the fact that majority of cities in the developing countries like Pakistan, pedestrian's signs are absent and if present are not followed by pedestrians and drivers. In Pakistan there is lack of knowledge and awareness regarding traffic rules and regulations and most of bike riders do not use helmets during driving. We found that 81.30% didn't use helmets and regarding 16.30% there is no idea about helmet use. Our results are quite consistent with the study done in Tehran by Zarger et al[38] who found 91.4% of the cases were non helmeted. Another study showed 72% of the cases as non helmeted ones. Literature search shows severity of injury is high among non helmeted patients.[39,40] A study shown only 3% of helmet use which is also evident in our study that only 2.43% of the cases had used helmets which is a critical issue and less than satisfactory, helmet use can result in prevention of TBI among bike riders.[41-44] Alcohal intoxication can also result in increasing prevalence of road traffic accidents. However, there is low prevalence of alcohol intoxication in our part of the world so only 0.8% of the cases were having history of alchohal ingestion. Similar study found 1.88% alchohal intoxicated patients.[45,36]

CT scan is the choice of initial imaging modality during the first 24 hours following head injury.[46] we also performed CT scan brain in all cases in our study. CT is more accurate in detecting the hematomas and bony pathologies as compared to MRI.[47] In case of deteriorating of neurological status of the patient, CT scan should be done as found by Papa M et al.[48] and Stippler et al.[49] Another study proposed that CT should be done in cases of some predictors like headache, vomiting, loss of consciousness or amnesia and alcohol intoxication.[50,51] Leong LB et al. found in a study done on 2038 patients, that CT scan should be done in the presence of LOC, vomiting and amnesia.[52] We also did CT brain in the presence of any of these signs in addition to arrival GCS of the patient. We found abnormal findings in all of our cases. Those who were not having any positive CT scan findings were excluded from our study.

In the current study 7.3% of cases were having depressed skull fractures, 18.82% subdural hematomas, 23.57% epidural hematomas, 48.70% contusions, 18.29% traumatic sub arachnoid hemorrhages and 13% pneumocephalus. A study is done which shows findings like epidural hematomas in significant number of cases, 5% having subdural hematomas with high mortality rates. However, mortality is related to the arrival GCS and time interval between trauma and surgery.[53] A study shown 12.5% mortality related to traumatic brain injuries due to motorbike injuries.[54] Our study showed 12.19% mortality. A study of 344 patients in Nepal showed 4.5% mortality. Whereas Hitimana et al found 13.2% mortality in his study.[55]

Intracranial hemorrhage, brain edema contusions and depressed skull fractures are the common CT findings following head trauma during road traffic crashes. A study showed 21.6% patients with brain edema.[56] We found 48.70% patients with brain edema (plus other pathologies) which is the second most common finding in our study after epidural hematomas. A study done which shows brain edema as the most common CT finding in patients with acute head injury.[57] We found 18.21% cases of traumatic sub arachnoid hemorrhage which is in contrast with the study which shows 41% of cases having traumatic subarachnoid hemorrhage.[58] The most common CT scan finding in a study conducted in Karachi, was brain contusion (14.1%); others included traumatic sub-arachnoid hemorrhage (7.1%), subdural hematoma (7.6%), extra-dural hematoma (5.8%) and depressed skull fracture (4.6%).[34]

CONCLUSION

Majority were males in our study, most of the patients who sustained head injury in motorbike accidents were drivers. Thirty six percent of the patients needed ICU stay of more than 1 week. Maximum of the patients needed conservative treatment.

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