

## Analysis of Head Injury Patients and Review of 100 Cases of Motor Bike Accidents

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### ABSTRACT

**Objective:** The authors show the prevalence of head injury with special emphasis on mechanism of head injury, different age groups affected and its impact on society.

**Materials and Methods:** Retrospective and prospective study conducted over a 6 months period. In this study, 3851 patients with head injury were assessed who presented in casualty outdoor department of our hospital. All age groups were included. The data from collected from patient's medical record and severity of injury was assessed through Glasgow coma scale.

**Results:** A total of 3851 cases were included in the study. Road traffic accidents remain the most common cause of head injury accounting for 2703 (70%) of cases, motor bike accidents were responsible for 1890 (72%) head injury among all cases of road traffic accidents while 408 (15%) were car accidents were among all 3851 cases, males were 2705 (70%) and females were 1148 (30%). Most common age range was 11 – 45 years having 2311 (60%) patients followed by patients above 45 years 962 (25%) and children 0 – 10 years of age 578 (15%) cases.

Among 100 consecutive cases of motor bike victims were studied and almost exclusively male population was found to be affected. Age distribution analysis age less than 13 years 5 (5%) cases, 13 to 25 years accounted for 55 (55%) cases and above 25 years included 40 (40%) cases. There were only 4% wearing helmets while 96% were without helmets. Severity of injury sustained in all cases of head injury was GCS 15 – 15 3080 (80%) GCS 9 – 13 in 1385 (10%) and 3 – 8 GCS in 385 (10%) cases. Among motor cycles 55 (55%) cases were between the age of 13 – 15 years was mild head injury the head injury was 55 (55%) cases, moderate head injury 30 (30%) cases and severe head injury was 15 (15%). The type of head injury sustained was depressed fractures in 15% cases, epidural hematoma was found in 8% cases, subdural hematoma in 12% of cases, contusions in 10% while the rest of scans were normal.

**Conclusion:** Motor bike accidents are the most common cause of head injury and strict implementation of traffic rules and media awareness may help to reduce incidence of head injuries.

**Keywords:** Head injury; road traffic accidents; motor bike injuries.

**Abbreviations:** TBI: Traumatic brain injury. GCS: Glasgow coma scale.

### INTRODUCTION

Traumatic brain injury (TBI) is a leading cause of disability, morbidity, and mortality worldwide and is responsible for a significant proportion of all traumatic deaths in the U.S. Every year, an estimated 1.5 million people die and hundreds of millions require emergency

treatment after a TBI.<sup>1</sup> Fatality rates and disability rates vary depending on the severity and mechanisms of the TBI, but the rates of unfavorable outcomes (death, vegetative state, and severe disability) following TBI can be higher than 20%.<sup>2</sup>

This study was done to identify the causes of head

injury in our region so that emphasis can be laid on simple and very basic measures that may help in reducing incidence and severity of head injury in our region.

**MATERIALS AND METHODS**

Analytical study was done of 3851 patients who visited to neurosurgery casualty outdoor department of Lahore general hospital over the period of 6 months i.e. from May 2012 to October 2012. The data was obtained from the database of neurosurgery Lahore General Hospital and medical record of patients. Patients of all age groups and both genders were included in the study. The patients without trauma history were excluded from the study. Each case was analyzed with respect to gender, age group, mechanism of injury.

Gender distribution was studied among patients by dividing the whole study population into male and female sub groups.

Age distribution was studied by dividing the population into three age groups; group I from 0 – 10 years, group II from 11 – 45 years and group III above 45 years.

Mechanism of injury was divided into road traffic accidents, falls, and miscellaneous. Road traffic accidents were further divided into subgroups of motor bike accidents, car accidents, pedestrians, rickshaw and heavy vehicle accidents.

Another 100 cases of motor bike accidents were analyzed on basis of age distribution, gender distribution, safety measure taken by riders (helmet), severity of injury, type of injury and outcome.

Severity of injury was assessed by Glasgow coma scale at the time of presentation. GCS scores from 14 to 15 was grouped as mild head injury, GCS scores from 9 to 13 moderate head injury and GCS 3 to 8 was grouped under severe head injury.

Type of injury was categorized on the basis of CT scan brain plain findings and was divided into epidural hematoma, subdural hematoma, contusions, cranial vault fracture, base fracture.

The outcome was determined by Glasgow outcome scale as below 1 – 5.

- Grade 1 represent death.
- Grade 2 permanent vegetative state.
- Grade 3 conscious but severe disability.
- Grade 4 disabled but independent.
- Grade 5 return to normal activities.

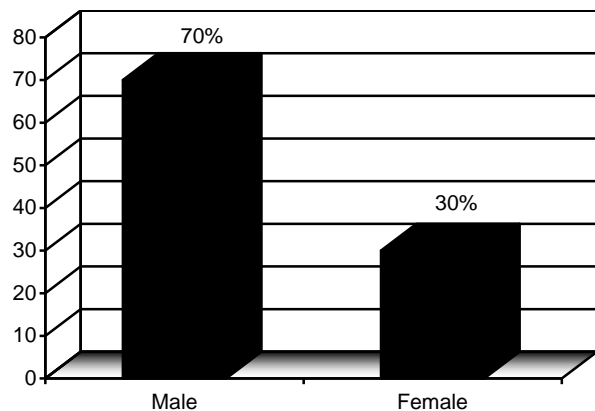
**RESULTS**

**Sex Incidence**

Total 3851 cases were included in the study. Gender distribution revealed 2703 (70%) males and 1148 (30%) were females. There was strong male predominance in head injury patients with male to female ratio 7:3 (2.3:1) as shown in table 1 and 2 and chart 1.

**Table 3: Sex Incidence.**

| Sex    | Number | Percentage |
|--------|--------|------------|
| Male   | 2703   | 70         |
| Female | 1148   | 30         |
| Total  | 3851   | 100        |



**Figure 1: Sex Incidence.**

**Table 2: Sex Incidence Month Wise.**

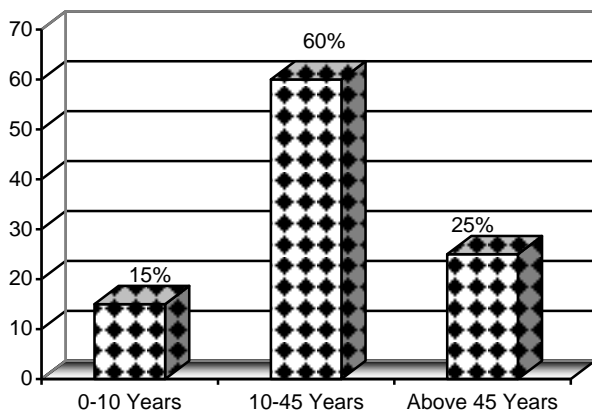
| Month           | Male | Female |
|-----------------|------|--------|
| May, 2012       | 400  | 171    |
| June, 2012      | 469  | 166    |
| July, 2012      | 491  | 254    |
| August, 2012    | 579  | 193    |
| September, 2012 | 354  | 191    |
| October, 2012   | 410  | 176    |
| Total           | 2703 | 1148   |

### Age Range

The data of 3851 cases was analyzed for age distribution among cases. There were 578 (15%) cases in age group 0 to 10 years, 2311 (60%) cases in age group 11 to 45 years and 962 (25%) cases above 45 years. Here it is evident that group 11 to 45 years is predominantly affected by head injury.

**Table 3: Age Range**

| Age            | Number | Percentage |
|----------------|--------|------------|
| 0 – 10 Years   | 578    | 15         |
| 10 – 45 Years  | 2311   | 60         |
| Above 45 Years | 962    | 25         |
| Total          | 3851   | 100        |



**Figure 2: Age Incidence.**

### Mechanism of Injury

Data analysis of 3851 cases that visited the neurosurgery casualty department in terms of mechanism of injury shows that 2703 (70%) cases were of road traffic accidents while falls accounted for 788 (20%) cases and 363 (10%) were miscellaneous including firearm injuries, blast injuries, fight, etc. So a major portion of patients comprised of road traffic accidents as can be seen table 4 and chart 3.

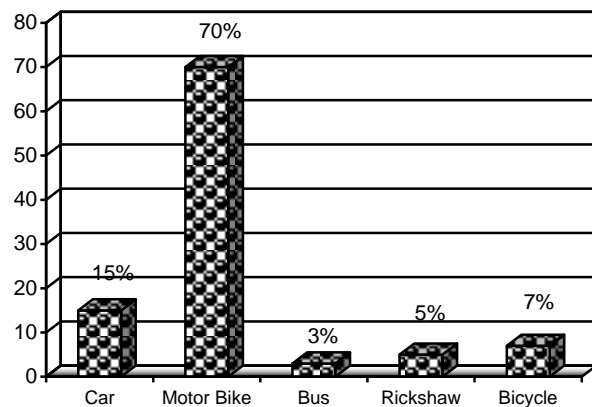
### Details of RTA Venical in Injury

The cases of road traffic accidents were further analyzed and the data revealed that out of 2703 cases of RTA there were 1892 (70%) cases, of motor bike accidents, were 405 (15%), cases of car accidents while

the remaining 405 (15%), included heavy vehicle, rickshaw etc.

**Table 4: Mechanism of Injury.**

| Month      | Road Traffic Accident | Fall | Miscellaneous |
|------------|-----------------------|------|---------------|
| May, 2012  | 400                   | 114  | 57            |
| June, 2012 | 463                   | 127  | 45            |
| July, 2012 | 500                   | 172  | 73            |
| Aug, 2012  | 579                   | 131  | 62            |
| Sep, 2012  | 381                   | 109  | 55            |
| Oct, 2012  | 380                   | 135  | 71            |
| Total      | 2703                  | 788  | 363           |



**Figure 3: Mode of Injury.**

### Use of Helmet and Severity of Injury

100 consecutive cases of motor bike victims were studied and almost exclusively male population was found to be affected. Age distribution analysis age less than 13 years 5 (5%) cases, 13 to 25 years accounted for 55 (55%) cases and above 25 years included 40 (40%) cases. There were only 4% wearing helmets while 96% were without helmets. Severity of injury sustained in all cases of head injury was GCS 15 – 15 3080 (80%) GCS 9 – 13 in 1385 (10%) and 3 – 8 GCS in 385 (10%) cases as shown in Fig. 4. Among motor cycles 55 (55%) cases were between the age of 13 – 15 years was mild head injury the head injury was 55

(55%) cases, moderate head injury 30 (30%) cases and severe head injury was 15 (15%). The type of head injury sustained was depressed fractures in 15% cases, epidural hematoma was found in 8% cases, subdural hematoma in 12% of cases, contusions in 10% while the rest of scans were normal.

**Table 5:** GCS.

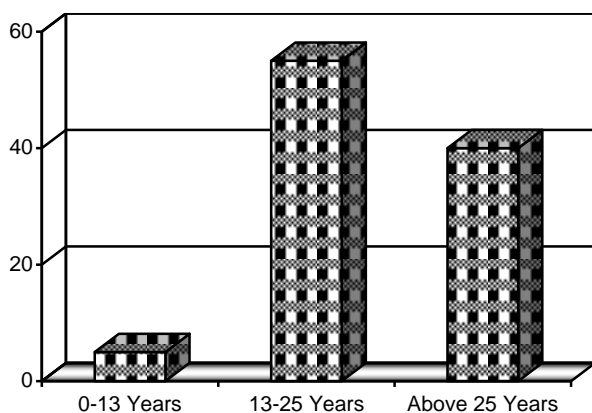
| GCS     | Number | Percentage |
|---------|--------|------------|
| 14 – 15 | 3080   | 80         |
| 9 – 13  | 385    | 10         |
| 3 – 8   | 386    | 10         |
| Total   | 3851   | 100        |

**Outcome**

Outcome on Glasgow outcome scale was grade 5 in 60%, grade 4 in 15% cases, grade 3 in 10% cases, grade 2 in 5% cases and grade 1 (death) 10% cases.

**Table 6:** Outcome.

| GCS   | Number | Percentage |
|-------|--------|------------|
| 5     | 2311   | 60         |
| 4     | 408    | 15         |
| 3     | 385    | 10         |
| 2     | 192    | 5          |
| 1     | 385    | 10         |
| Total | 3851   | 100        |



**Figure 4:** Age of 100 Cases of Motorcycle Accidents.



**Fig. 5:** Showing motor cycles and with one wheeling and young motorcyclist with head injury.

When 100 cases of motor bike accidents were analyzed 55% were between age group 13 to 25 years making it the common age group. 55% suffered from mild head injury, 30% had moderate and 15% suffered from severe head injury.

**DISCUSSION**

Head injury remains one of major cause of morbidity and mortality affecting a large population group directly and indirectly.<sup>3</sup> Reports of head injury vary widely between different epidemiological studies due to the lack of a common clear definition of head trauma, different study samples, and methodology issues.<sup>4-6</sup> Further there is minimal work done on this aspect especially in our region. For these reasons, comparison between different studies is difficult. In our study, Head Injury was defined according to the level of consciousness (Glasgow coma scale) and anatomical lesion.

Head injury following road traffic accidents is on up rise in developing countries due to increased traffic load, better roads, poor civic sense and weakly implemented traffic rules and regulations and lack of safety measures taken by the passengers / drivers.<sup>7-10</sup>

Lahore is the second big city of Pakistan and capital city of Punjab province. Lahore General Hospital is one of the four major hospitals in the city and is the largest centre of head injury in Pakistan which caters the head injury patients from Punjab province and northern areas of Pakistan.

The statistical analysis of data shows that 3851 patients presented in neuro emergency of Neurosurgery Unit 1 over a period of six months with male to female ratio of 2.3:1 which shows slight increase in female population when compared to previous study<sup>1</sup> and 60% of these fall in age group of 10 – 45 years

which is comparable to previous study<sup>1</sup> and constitute the main working group of population and 70% cases were of road side accidents which is much higher 52.8% in previous study.<sup>1</sup> The road traffic accidents are thus main bulk of head injury as in other studies.<sup>1,2</sup> In 70% of road traffic accidents motorcyclist were the victims. Data analysis shows that over all among 3851 head injury patients there were about 1880 motorcyclist which constitute almost half of total cases.

When 100 cases of motor bike accidents were analyzed 55% were between age group 13 to 25 years making it the common age group. 55% suffered from mild head injury, 30% had moderate and 15% suffered from severe head injury. Only 4% had taken safety measures (helmet). Further only 35% were having driving license while 65% were not having driving license. There were 78% patients with good recovery, 12% went into vegetative state and mortality rate was 10%.

## CONCLUSION

Here we would like to conclude that motorcycle accidents were one of the major causes of head injury that are affecting the population in most productive age group and thus increasing the burden on family of patients and health care system. Further research should be done and adequate steps should be taken by the government to reduce the incidence of head injury as simple safety measure of helmet may reduce head injury incidence by 45% among motor bike riders.<sup>3</sup>

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