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SECTION 20. Medicine.

DIFFERENT PATTERNS OF LIMB INJURIES IN VICTIMS OF MOTORBIKE ACCIDENTS

Abstract: Objectives: It is a retrospective study. This study was conducted to analyze Accidents by two-wheel vehicles reported to a single hospital in twelve months duration. In this study injuries to the limbs were observed in relation to different zones of limbs. Different pattern of injuries were studied in driver and pillion rider and results were compared.

Methods: All information and data collected from documents of hospital records. Various anatomical zones were assigned to the limbs and injuries were studied according to these zones. Trauma of diver and pillion rider were analyzed and compared with each other.

Results: Between 1st Jan 2017 to 31st December 2017, 240 two wheeler accidents were recorded. 110 had injuries of limbs. Results were obtained from Bahawal Victoria Hospital Bahawalpur Punjab Pakistan. 85 cases were added in the study cases and of these 60 were drivers. Skid and fall injury was the most common mode of injury of the vehicle. Pillion riders had injuries mostly in accidents between motorbikes and four wheeler vehicles. In drivers mostly wrist and hand regions of upper limb were involved and in the lower limb the tibia and ankle regions. In the pillion rider, tibia and ankle were involved in lower limbs whereas shoulder and wrist were mainly injured in lower limbs.

Conclusion: Accidents of motorbikes cause much trauma to the driver and person sitting behind him. Mostly trauma of wrist and tibia were observed among bike-riders. Most of the injuries in upper limb were similar in both groups.

Key words: Motorbike accidents; epidemiology; limb injuries.

Language: English

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1. Introduction

This study was done in a tertiary care hospital. Use of motorbikes is so common in the city. That is the reason motorbike accidents are mostly involved in accidents. Causative factors of these accidents are use of sedative drugs by the drivers, overloading and not following traffic rules.

A study was done in India on the accidents and use of helmet.¹ There are few researches based on the pattern of limb injuries as done in this study. In Jamaica a study was done on the trauma of motorbike riders. He studied that ignorance of safety measures cause serious injuries of limbs.²

They concluded that upper and lower limbs were commonly injured. Majority of victims were male. Many of these victims were operated for trauma. Most of the cases got minor trauma.

A similar study was done in Nigeria, in which victims of motorbike accidents were studied, contributing 18% of all road traffic accidents. In 13.5% cases articulated vehicles were involved. Remaining accidents caused by buses and motorbikes. 68% patients were pillion riders. They got collision with cars.³ In 50% patients tibial fracture occurred which was very common injury among the victims.⁴



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A similar study done was in Western Maharashtra analyzed and various modes of injuries studied in road accidents. Following findings were recorded.⁵ Most of the victims were males having age of 20-29 years. Those falling in young age group account 10% of total victims. Accidents due to motorbikes account 35% of all road accidents. In all the pedestrian victims, 32% got trauma from motorbikes. In this study one hundred and ninety fractures were recorded. Majority fractures of tibia (46.3%), on second number fractures of upper limbs (24.7%) and then skull fractures. Most of the studies conclude that upper limbs injuries are more common than those of lower limbs in motorbike accidents. In a study by Jha et al, maximum victims were males (83%) and most of them were labourers.⁶ About 31% of the vehicles were motorbikes causing accidents. Majority of victims were below 30 years. Victims of age less than 10 years were 35% of all injured. Pedestrians, drivers and those having vehicles account 22%, 35% and 45% respectively. People using bicycle were in more number than using motorbikes. Among them pillion riders were in least number.

Another study done in Calabar concluded that motorbikes account 63% of all accidents. He also reported that injuries to lower limbs were more than upper limbs.

Most of the victims were having open fractures. Among them 50% victims got multiple fractures.

Another study was done in India about road traffic accidents by motorbikes.⁶ No study done in Pakistan on this topic in detail ever. Above studies show prove that most of the road traffic accidents occur due to motorbikes all over the world.

In this study all those victims of motorbike accidents recorded who presented in accident and emergency department of B.V Hospital Bahawalpur Pakistan.

2. Materials and Methods

This is a retrospective study. This study was done to determine pattern of limb injuries reported in orthopedic unit of Bahawal Victoria Hospital Bahawalpur. Data collected about victims of motorbike accidents in relation to driver and pillion rider. Data of both groups compared with each

other. All data was documented on a designed proforma. The study duration was from 1st January 2017 to 31st December 2017. Only those victims were included in the study which got trauma while driving motorbike or they were sitting behind the driver on the bike. Those were excluded who were not injured. Accidents by four wheelers were not included. Information gathered from official documents of the hospital. Record of accidents during the mentioned period of twelve months, was obtained from registers. Which cases were falling in the criteria were included and all other cases were excluded. A written permission was taken from Medical Superintendent of the hospital. The data was put in a systemic manner and composed in a format. Upper and lower limbs were assigned different zones. Data was classified according to the zones of injury and data was expressed in the form of tables and charts and compared with each other. Software used to compose data was Microsoft office version 2007.

3. Results

Casualty records were analysed for the period 1st Jan 2016 to 6th Jan 2017. 310 road accidents were observed during this period. Of these 240 involved two wheelers. One hundred ten cases had limb injuries associated with fractures in this group. Fifteen patients of this group had insufficient data available on record to justify addition to the data sheet. Eighty Five cases were eventually included in to the study protocol. There were 60 drivers and the rest were pillion riders.

The mode of injury was most commonly skidding and fall of the two wheeler. Thirty Eight of 85 patients had injury due to this mode (44.7%). The next more common mode of injury was a collision between a four wheeler and a two wheeler (28 cases, 32.9%). Other modes of injury seen were collision between two wheelers, a collision between a two wheeler and a stationary object and between a two wheeler and a three wheeler. The rider (driver) was more commonly injured in a skid and fall followed by a two wheeler to a two wheeler collision. The commonest mode of injury for a pillion rider was a collision between a two wheeler and a four wheeler (11 cases, 44 percent), closely followed by a skid and a fall injury (32%) (table 1).

Table 1

Different modes of injury

Mode of injury	Driver	Pillion
Collision of motorbike with a static object	1 (1.6%)	0 (0 %)
motorbike to motorbike	11 (18.3%)	4 (16%)

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Motorbike to three wheeler vehicles	1 (1.6%)	2 (8%)
motorbike to four wheeler vehicles	17 (28.3%)	11 (44%)
Slip and fall from motorbike	30(50%)	8 (32%)
Total	60	25

Eighteen open fractures recorded in victim drivers (30%) while 5 open fractures recorded in the pillion riders (28% of pillion rider group). In both

groups frequency of open and closed fracture was almost same (table 2).

Table 2**Open and closed fracture in the drivers and pillion riders**

	Driver	Pillion
Open fracture	18 (30%)	5 (28%)
Closed fracture	40 (66.6%)	20 (80%)
Both open and closed fractures	2 (3.3%)	2 (8%)
Total	60	25

When data was compared it was observed that mostly zone-3 of upper limb got trauma (34.48%) while in both lower limbs zone-4 was involved

(38.81%). So we can say that mostly injured parts of the body in the drivers were wrist, hands, ankle and foot. (Table- 3&4).

Table 3**Fractures of upper limbs in relation to the zones of injury**

	Driver	Pillion Rider
Zone I	8 (13.3%)	2 (8%)
Zone II	10 (16.6%)	1 (4%)
Zone III	8 (13.3%)	4 (16%)
Zone I & Zone II	4 (6.6%)	-
No upper limb injury	30(50%)	18 (72%)

Table 4**Fractures in different zones of lower limbs**

	Driver	Pillion rider
Zone I	1 (1.6%)	0 (0%)
Zone II	1 (1.6%)	5 (20%)
Zone III	4 (6.6%)	2 (8%)
Zone IV	23 (38.3%)	8 (32%)
Zone V	1 (1.6%)	3 (12%)

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Zone I & Zone II	2 (3.3%)	
Zone II & Zone IV	1 (1.6%)	
Zone III & Zone IV	2 (3.3%)	
Zone IV & Zone V	1 (1.6%)	
No lower limb injury	24 (40%)	2 (8%)
Zone V		2 (8%)
Zone II, Zone III & Zone IV		2 (8%)
Zone I, Zone III & Zone IV		1 (4%)

Data obtained about pillion riders showed that in upper limbs only zone-1 and 3 were mostly involved and in lower limbs zone-4 was involved commonly. Hence mostly tibia and ankle fractures occurred in the legs and shoulder and wrist in upper limbs. It was observed that drivers got more injuries than pillion riders as expressed in table-3&4. Six of them got trauma of lower limbs and 4 of them in the upper limbs. While just 3 victims recorded from pillion riders with multiple fractures. In both categories trauma of lower limbs was more common than upper limbs. The extent of trauma could not be evaluated.

4. Discussion

Accidents by motorbikes are very common in Asian and European countries. Many Studies on this topic have been done in other countries.⁵⁻⁷ Indian authors Jha and patil have done similar study.^{5,6} Eighty five cases were falling in the criteria including 60drivers 25 pillion riders. Drivers were injured more than pillion riders. Drivers got trauma of upper and lower limbs. Most of the fractures recorded were open in nature. Complicated injuries involving both upper and lower limbs were common in drivers of motorbikes. They got mostly trauma of wrist and shoulder regions and ankle and tibia. There were different modes of injuries recorded in which trauma due to fall and slip of bikes was more common. Mostly accidents happened between motorbikes and motorbikes with cars and other four wheeler vehicles. Data showed that drivers of motorbikes got severe trauma as compared to drivers of cars and four wheelers. They got multiple injuries and fractures. Fracture of legs was found in higher number. Its main reason was lack of safety

measures. Law on this issue has been made to take proper measures of safety before driving but issue is that it is not implemented or not followed by the citizens. There is much lack of awareness among the people about these measures. There should be awareness programmes on this issue in schools, colleges and universities. Strict implementation of traffic rules and regulations can decrease these accidents. Due to some deficiency of available records and limitations of the hospital, we could not increase sample size. This study can help us to understand different modes of injuries in the accidents of two wheelers. We may predict that which body parts are more likely to get trauma and hence we can safety measures regarding this. By increasing sample size of this study and parameters we can further get much useful information. It is suggested that all cases of trauma reported in hospitals should be documented properly on computers in a proper format so that this data should be used in future for research work and to increase facilities of the hospital. History, examination points, investigation result and treatment taken by the patient, admission, discharge and follow up all data should be recorded.

5. Conclusion

Motorbikes are mostly involved in road traffic accidents and. Most of the trauma in the accidents is due to motorbikes collision with other vehicles. A person driving a bike gets severe trauma during accident than the person sitting behind him on the bike. Mainly upper and lower limbs are injured than other parts of the body. Trauma of tibia, ankle, shoulder and wrist is common.

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Appendix 1

Upper limb:

Zone 1: Shoulder+ arm (clavicle + acromio-clavicular joint + shoulder girdle + shaft of humerus); **Zone 2:** Elbow joint + forearm (lower end of humerus + Radius, ulna excluding wrist); **Zone 3:** Wrist + hand

Lower limb:

Zone 1: Pelvis; **Zone 2:** Hip bone + proximal part of femur + shaft of femur; **Zone 3:** Distal part of Femur and knee joint; **Zone 4:** Tibia and Ankle; **Zone 5:** Foot.

