

PATTERN OF MOTORCYCLE-ACCIDENT ASSOCIATED INJURIES IN PORT HARCOURT – A HOSPITAL-BASED STUDY

By

EKERE A.U. & IBEANUSI S.

Department of Surgery, University of Port Harcourt Teaching Hospital, Port Harcourt

SUMMARY

Objective: To document some of the determinants and types of motorcycle-accident associated injuries in patients attending a private orthopaedic practice in Port Harcourt.

Method: This is a 12 month prospective study starting March 2001. Relevant data was collected by the attending surgeon in a questionnaire previously prepared for the purpose. Frequency distribution tables were generated manually from this data.

Results: One hundred and eighty six (186) road accident victims were seen out of which 47.3% were motorcycle accidents. The peak age of the victims was 20 – 39years and these made up 68.2% of the patients. The male/female ratio was 2:1. All 26 cyclists in the series were males; and pillion passengers were at the greatest risk of being injured.

Most of the injuries occurred between Friday and Saturday (40.91%), and during the rainy season (47.7%). The largest proportion of the accidents occurred in the Diobu area Port Harcourt (28.4%).

Most cases presented in the hospital immediately or after attention in other medical facilities (76.1%), while 23.9% sought traditional bonesetters' help before presenting. The latter group often presented as late as a week after the injury.

Injuries to the extremities constituted the bulk of the injuries (54.3%). Motorcycle-car collisions were the commonest mechanism of injury (56.8%), while indirect or secondary injuries were commonest types (59.1%) of injuries.

Conclusion: Motorcycle accidents cause a high proportion of road accident related injuries presenting to the Rehoboth Specialist Hospital, Port Harcourt.

Recommendation: Safety precaution is still the gold standard for prevention of motorcycle accident related injuries.

Key Words: Motorcycle, Cyclists, Pillion riders, Pedestrians.

INTRODUCTION

Trauma-related injuries are a major cause of concern worldwide and their occurrence is also on the increase¹. Road traffic accidents constitute a major part of traumatic injuries^{2,3,4}. These injuries and particularly the motorcycle injuries have become a major public health concern^{1,2}.

Asogwa's stand is that road traffic accidents, including the motorcycle contribution have become an 'endemic disease with epidemic dimensions'². In Southern Nigeria, the bulk of road traffic related injuries are from motorcycle accidents^{5,6}. Motorcycle related problems have become a major cause of concern worldwide, because of the many avoidable morbidity and mortality associated with this particular type of vehicle.

The introduction of commercial motorcycles, due to the downturn of the Nigerian economy since the late 1970s, has increased the

contribution of this equipment on wheels⁶ to the burden of road traffic related injuries. The recklessness exhibited by the cyclists themselves constitutes them into a peculiar risk group that could be likened to a suicide squad. The motorcycle related injuries impact the society negatively, because the young, active and economically productive males constitute the group at highest risk⁷. Any region of the body can be affected, but by far the commonest causes of fatality are head and neck injuries^{8,9}. The pillion riders are usually the highest exposed group of motorcycle users to injuries^{10,11}. The cyclists sight the danger first, attempt safety maneuvers and are also more stable by holding both handles of the motorcycle¹². The extremes of age are affected, probably due to the fact that they are less active and most of the time indoors^{9,13}.

The causes of these injuries are usually viewed from the common epidemiological

Correspondence Author:

Dr. Ekere A. U., 2 Winners' Way, Off Afam Street, D/Line, P.O.Box 12640, Port Harcourt
Accepted for publication 4th March 2002

perspective of, host or human factors (user-related contributions), environment or road-related problems and agent or vehicle contributions^{2,14}. Ignoring safety precautions contributed to the causation of many motorcycle accidents. Crash helmet use, for instance, have become a past emphasis in Port Harcourt and many other towns in Nigeria. Ignorance, poor maintenance of roads and motorcycles, use and abuse of drugs, visibility and climatic conditions have all been implicated as causative factors^{1,11,12,14}.

This study aims at a prospective analysis of the antecedents, mechanisms and a broad categorization of motorcycle-accident associated injuries in Port Harcourt as seen in a private orthopaedic-trauma practice.

MATERIALS AND METHODS

This is a 12 month long prospective study starting from March 2001 and conducted at the Rehoboth Specialist Hospital, Port Harcourt. The hospital is a private orthopaedic-trauma centre.

The relevant primary data was collected by the first doctor to attend to the patient using a questionnaire previously prepared for the purpose. The data was analyzed manually and presented as frequency distribution tables.

RESULTS

The total number of road accident victims seen during the period of study was 186. Of these, 88 (47.3%) were motorcycle-related. The peak age group of the victims was the 20 – 39 year age groups, which made up 68.2%. The extremes of life were relatively spared while the male/female ratio was 2:1, table 1.

Table 1
Age and Sex Distribution of 88 persons injured in Motorcycle Associated Accidents

Age Group	Sex		Total	%
	Male	Female		
0-9	2	2	4	4.6
10-19	3	5	8	9.0
20-29	20	12	32	36.4
30-39	23	5	18	31.8
40-49	8	2	10	11.4
50 and Above	3	3	6	6.8
Total	59	29	88	100.0

The pillion riders had the highest risk of injury, while all the motorcycle riders were males, table 2.

Table 2
Role and Sex Distribution of the 88 Motorcycle-Accident Injured Persons

Role	Sex		Total	%
	Male	Female		
Cyclist	26	0	26	29.55
Pillion Rider	26	22	48	54.55
Pedestrian	7	7	14	15.90
Total	59	29	88	100.0

The most common injuries were those to the extremities, which made-up 51 (54.26%) of the injuries. Injuries to the head and neck were seen in 12 (12.77%) while other parts of the body were involved in 31 (32.99%) of the patients. About 7 persons (8.0%) had multiple injuries involving more than one region of the body.

Majority of the accidents occurred over the weekends, particularly on Saturdays (23.86%), while the least was in the middle of the week, on Thursdays (9.1%), table 3.

Table 3
Distribution of 88 Motorcycle Accidents by the Days of the Week

Day of the Week	Frequency	%
Monday	9	10.23
Tuesday	10	11.36
Wednesday	13	14.77
Thursday	8	9.09
Friday	15	17.05
Saturday	21	23.86
Sunday	12	13.64
Total	88	100.00

The accidents occurred most commonly in the evenings, which contributed 29.6% of the accidents; 22.7% each in the mornings and afternoons; while it occurred at night in 18.2% of the cases. In 6.8% of the cases, time of occurrence was not ascertained.

Motorcycle accidents occurred mostly when there is collision between a motorcycle and a car (table 4).

Table 4
Types of 88 Motorcycle Accident Occurrences

Types of Collision	Frequency of Occurrence	%
Motorcycle versus Motorcycle	11	12.5
Motorcycle versus Car	50	56.8
Motorcycle versus Trucks/buses	6	6.8
Motorcycle versus Pedestrian	12	13.6
Spontaneous*	9	10.3
Total	88	100.00

In 35 persons (40.9%), injury was a direct result of the impact while in 52 persons (59.1%) injury was indirect, resulting from the fall secondary to the impact.

A good number of the cases presented within the first hour after injury (26.1%) while delays of more than one week occurred in 25.1% of the cases, table 5.

Table 5
Time after the Accident within Which the 88 Casualties Presented At the Centre

Time of Presentation	Frequency	%
Within 1 hour	23	26.1
Within 1 hour to 6 hours	13	14.8
Within 7 hours to 24 hours	14	15.9
Within 2 to 7 days	13	14.8
More than 7 days	22	25.0
Unspecified time	3	3.4
Total	88	100.00

About 37.5% of the victims were brought to the centre or other medical facility (38.61%) directly from the site of the accident while the rest (23.9%) visited traditional bonesetters first.

Table 6
Location of 88 Motorcycle-Associated Accidents within Port Harcourt and Environs

Location of Accident	Frequency	%
Diobu	25	28.4
Government Reserved Area (GRA)	7	8.0
Trans-Amadi Layout	5	5.6
Obio-Akpor	7	8.0
Aba Road	9	10.2
Town	7	8.0
Outside Port Harcourt	24	27.3
Unspecified	4	4.5
Total	88	100.00

Diobu area, contributing 28.4% of the accidents seems to be a high risk zone for motorcycle accidents (table 6). There was some suggestion of seasonal variation as 45 (51.1%) of the accidents occurred during the rainy season (April to October), while 41 (46.6%) occurred in the dry months of November to March. Time of the year was unavailable in 2 (2.3%) of the accidents.

DISCUSSION

Motorcycle-accident related injuries constitute a major road-traffic-accident load in Port Harcourt, Nigeria as shown by this study. They contributed about 47.3% of all road accident related injuries in this series. This trend seems uniform in South-south Nigeria and in many other parts of the country^{5,6}. Contributing to this is the high population of motorcycles in the city, where they are preferred for use as commercial vehicles to provide fast intra-city commutation¹². The educational level of the cyclists and their disregard of safety regulations were only other contributing factors to this carnage on the roads^{1,13}.

The results of this study showed that, following global patterns, the young adult male is at greatest risk of being injured in a motorcycle-accident related injury^{2,3,6}. This is the economically active and constantly exposed population in the society. The cumulative effect of these injuries is loss of several man-hours of economic and social activities due to the subsequent morbidity and sometimes painful fatality associated with these accidents.

The least exposed groups are the very young and the very old. This has been noted in other studies to be due to their relative inactivity, dependence on and protection by the young adults¹³. Adeloye et al⁹ had a sizeable number of under 9 year old persons involved in such accidents while Sevitt⁸ had a significant number of over 60 years old subjects in their respective studies.

The pillion rider was at highest risk amongst road users in this study. Bothwell¹⁰ found that the pillion passenger had a 5% higher risk than the cyclist of being injured. In the current study, a ratio of 48 pillion passenger to 26 cyclists was observed and all the cyclists were males. This dominance of pillion passengers among the injured is explained by the fact that the cyclist sees the danger and threat first and makes the necessary adjustments and preparations to receive the impact while the passenger is often oblivious

of the danger until it is too late. Besides, the cyclist is more stable because of his grip on the two handles of the motorcycle¹².

In this study, the commonest injuries affected the extremities, constituting 54.3% of all the injuries. Zetas et al¹⁵ found extremity fractures in their analysis of injuries in motorcycle accidents in the neighbourhood of 65.7%. Extremity injuries, especially fracture of major bones of the lower limbs are common. Humeral fractures are less frequently encountered in these injuries¹⁵.

Motorcycle accidents occurred most frequently on weekends, with Saturday presenting the most risky day. Related to this is the occurrence of the accidents in the evenings, between 4.00 and 6.00pm. In this study, 55.1% of the accidents occurred in the afternoons and or evenings. A similar pattern was observed in the Urban Resource centre report on the pattern of Accidents in the developing world¹⁶. This is explained by the heavy traffic usually seen at close of work in the evenings and the increased frequency of traveling, both intra and out of the city, on weekends.

The finding that motorcycle-car collisions formed the commonest mechanism of injury confirms Bothwell's observation¹⁰ in the United Kingdom. In that study, it was found that the personal injury rate of the motorcycle user is four times that of the car occupant and that 97% of motorcycle-car-collision casualties are motorcyclists. Most of the injuries sustained were of a secondary or indirect nature. These injuries usually occur after the collision had caused a fall and are not a direct result of the impact¹⁴.

The acute case presented in this facility immediately or after attention in another medical facility. Cases of delayed presentation usually passed through the traditional bonesetters. The last group constituted a major challenge in orthopaedic management as they often presented with awkward limbs that tasked the reconstructive acumen of the attending surgeon. They took more theatre time, spent more time and money in the hospital and most importantly often had less than satisfactory outcome.

Most of the injuries were admitted during the rainy season and this had been the pattern in this environment¹³. The densely populated part of the town, with poor facilities, presented the highest load of victims. The relatively more organized areas of the town such as the Government Reserved Area (GRA) and Township

area with lower population recorded less number of casualties. This is probably because residents of the GRA and Township areas, being more affluent, are likely to be driving their own cars rather than be pillion passengers in a motorcycle. Besides, these parts of the city are better planned, have better road facilities with less likelihood of accidents occurring there than in the slum areas.

Alcohol consumption did not appear to be a major determinant of the risk of accidents and injury in this study. This is probably because breath analyzer was not available nor was it possible to measure the blood alcohol level of either the riders or the passengers. Alcohol is, however, one of the implied causes of motorcycle accidents worldwide^{6,13,14}. It is hoped that with awareness and availability of tests and testing centres, the contribution of this factor would be determined.

Motorcycle accidents, especially in the developing world, are gradually becoming the leading cause of road morbidity and fatality in modern times. Concerted efforts by both the government and society through good programmes, not unfulfilled political promises, might stem this tide. On the other hand bad government and lack of people oriented programmes might elevate these avoidable tragedies to monstrous dimensions. Safety precautions are the mainstay of prevention^{6,13,14}. It is hereby suggested that the medical profession should be in the vanguard of mobilizing society combat this scourge.

REFERENCES

1. Eke N. Road traffic accidents in developing countries: who is liable? Anil Aggrawal's Internet Journal of Forensic Medicine and Toxicology, January – June 2001; 2: 1.
2. Asogwa SE. Road traffic accidents: a major public health problem in Nigeria. Public Health, 1978; 92: 27 – 30.
3. Demeter Dorrit de and Hoine Geoffrey. An assessment of trauma management in Wellington region. Australian and New Zealand Journal of Surgery, 1987; 57: 715 – 722.

4. Jaja MOA. The changing patterns of injury in Africa. *West African Journal of Surgery*, 1973; 1: 162 – 166.
5. Archibong AE. Abdominal trauma in children. *Postgraduate Doctor in Africa*, 1944; 17: 56 – 60.
6. Ekere AU. Motorcycle accidents and lower limb bonny injuries. Part II Dissertation to the National Post Graduate Medical College of Nigeria, 1990.
7. Harvard JDJ. Alcohol and road accidents. *The Practitioner*, 1962; 188: 498 – 507.
8. Simon Sevit. Fatal road accidents: injuries, complications and causes of death in 250 subjects. *British Journal of Surgery*, 55: 481 - 505.
9. Adebola Adeloye, Odeku Latunde E. The pattern of road traffic accidents seen at the UCH Ibadan, Nigeria – a preliminary study. *West African Journal of Medicine*, October 1997: 153 – 157.
10. Bothwell PW. The problem of motorcycle accidents. *The Practitioner*, 1962; 188: 474 – 488.
11. Gissane W, and Bull John. Injuries from road traffic accidents. *The Practitioner*, 1962; 188: 489 – 496.
12. Seleye-Fubara D and Ekere AU. Motorcycle related deaths in Port Harcourt, Nigeria: a hospital based study. *The Nigerian Health Journal* 2002. In Press.
13. Eke N, Etebu EN and Nwosu SO. Road traffic accident mortalities, Port Harcourt, Nigeria. *Anil Aggrawal's Internet Journal of Forensic Medicine and Toxicology* July to December 2002; 1 (2).
14. Rafindadi AH. A review of injuries sustained following road traffic accidents and their prevention. *Nigerian journal of Surgical Research*, 2002; 2: 100 – 104.
15. Zettas James P and Zettas Paul. The Nasophon, Bunsri. Injury patterns in motorcycle accidents. *The Journal of Trauma*, 1979; 19: 833 – 836.
16. Urban Resource Centre. Pattern of Accidents in the Developing World – Hourly Pattern of Road Traffic Accidents. www.urckarachi.org/fof October 2001.