

# MOTORCYCLE ACCIDENTS IN A NIGERIAN UNIVERSITY CAMPUS. A ONE YEAR STUDY OF THE PATTERN OF TRAUMA SUSTAINED IN UNIVERSITY OF BENIN CAMPUS

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## SUMMARY

**Objective:** A one-year study of the pattern of injuries sustained from motorcycle accidents (MCAs) in a University campus in Nigeria.

**Subjects and Methods:** A retrospective study of the medical records of 918 road traffic accident patient attending the Accident and Emergency Unit (A & E) of the University of Benin Teaching Hospital (UBTH) in the year 1998 was carried out with a view to determining the prevalence and pattern of injuries sustained with MCA. The scope of the study only included registered injuries sustained within the University Campus and its environment. MCA patients were grouped under rider, passenger and pedestrian.

**Results:** MCA patients constituted 14.4% of the total number of 918 in Road Traffic Accident (RTA). Males were more involved than females in the ratio of 2.2 to 1. The mean age of MCA victims was 30 years and the major cause of accident was collision with automobiles accounting for 54%. 49% percent of the patients were motorcycle riders making them the highest risk group. Majority of the patients sustained varying degree of lower limb injuries. Head and facial injuries (23%) were trivial or moderate in nature. No fatality was recorded in this series.

**Conclusion:** Passengers and pedestrians who are the ultimate users of the motorcycle transport system in the campus showed lesser risk of sustaining injuries in the event of an MCA ( $P > 0.001$ ) when compared with the riders. The injuries pattern reflects more of a low energy transfer traumas against high-energy transfer injuries commonly seen in the intra and intercity motorcycle accidents.

The use of motorcycles in our campus as the main commercial means of transportation appears to have low mortality but significant morbidity rate. Motorcycling can be made safer if some accident preventive measures are put in place by University authorities.

**Keywords:** *Motorcycle accident, University campus, trauma pattern.*

## INTRODUCTION

Commercial motorcycles (known as 'okada' and the riders; 'okadamen') are almost the only means of public transportation in most Nigerian University campuses. In University of Benin they ply every road and route within and the immediate university environs where students and staff reside.

The manouvers of these motorcycle riders on the road have often raised expressed concerns in view of the high risk of accidents they expose other road users to. Despite the outcry of recklessness displayed by motorcyclists with its attendant perils, the society appreciates their socio-economic relevance and advantages in the mass transportation system.

Documented injury pattern of motorcycle accident, MCA, and its significant contribution to RTA morbidity and mortality in general, has been widely reported<sup>1,2,3,4</sup>. These reports were injuries sustained on busy metropolitan intra-city roads and inter city high ways where motorcycles share the risks and hazards of busy

traffic with automobiles. The risk factors influencing these accidents are host factors (the victims), the agents (the vehicle), and the physical and social environment<sup>1</sup>.

Odelowo<sup>5</sup> found 10.3% MCA in 715 RTA cases reported and recorded a mortality of 6.8%. Implicated fatality outcome in MCA range from 6.8% to as high as 80.6% in reviewed literature<sup>7,8,9</sup>. The major causes of mortality were severe head injuries and poly trauma from high-energy transfer impact at the time of injury.

Panichaphangse et al<sup>6</sup> concerned about the overall risks with high mortality rate of motorcycling, advocated the promulgation of safety protective helmet laws. Mac Swan and Lemmies<sup>10</sup>, Odelowo<sup>5</sup> had independently reported an increased incidence of head injury and high mortality risk with the repeal of crash helmet laws.

Interestingly, the injury pattern in a campus setting contrasts significantly from those of the intra-city or intercity in the injury distribution and severity.

This report, therefore, records a one-year observation of the injury pattern in University of Benin campus and highlights

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perceived accidents risk which members of the University community are exposed to with the widely popularized 'Okada' commercial transportation system. Recommendations are made on ways of making motorcycle transportation safer in our campus rather than outlawing them.

#### PATIENTS AND METHODS

For a period of one year January to December 1998, data was collected pertaining to road traffic accident injuries sustained by patients involved in motorcycle accidents presenting at the Accident and Emergency Unit (A/E) of University of Benin Teaching Hospital, Benin City, Nigeria.

Personal details, diagnosis and circumstances relevant to the accident as documented in A/E were extracted. All patients whose accidents occurred within the University and University Teaching Hospital campuses and its immediate environs were included in the study. Age, gender, type and site of injury, and status of the victim in the RTA were analyzed. Information from A/E records was complimented from case files of the admitted patients. Where there was insufficient data in this reports, it was so stated. Statistical analysis was by Statistical Package for Social Sciences (SPSS).

#### RESULTS

In a 12 months, period a total of 138 motorcycle accident victims presented to the A & E department of the University of Benin Teaching Hospital. Age ranged from 1 year to 64 years (mean 30 years). Sixty eight percent of the total were aged

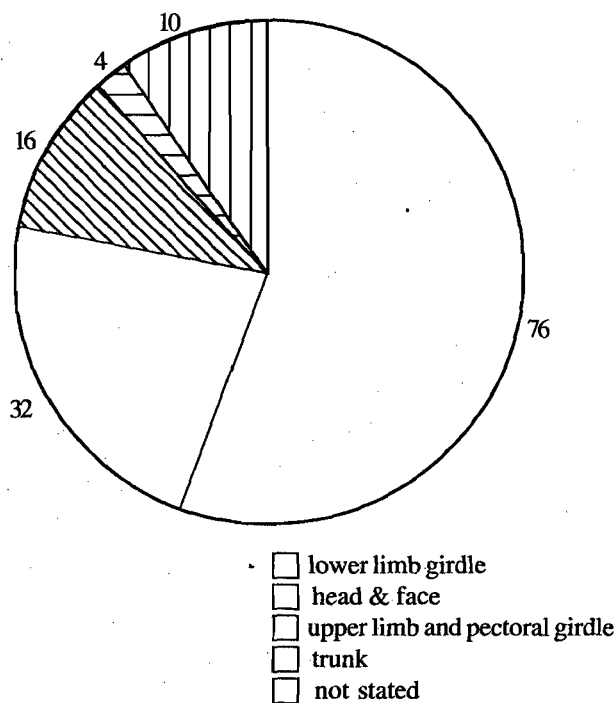
between 15 and 40 years. The majority (69.6%) of the patients were male (see Table 1). The riders were more at risk of sustaining injuries in an event of an accident as they account for 52.8% (Table 2) with the passengers and pedestrians accounting for 36.9% and 10% respectively ( $P < 0.001$  chi square = 81.95 df = 3). The major cause of accident was attributed to collision with

Table 1: Age and Gender of Victims

Age in years	Male	Female	Total no
1-4	1	-	1
5-9	2	3	5
10-14	1	2	3
15-19	2	8	10
20-24	19	16	35
25-29	16	5	21
30-34	12	3	15
35-39	12	1	13
40-44	7	1	8
45-49	10	-	10
50-54	5	1	6
55-59	3	-	3
60-64	1	1	2
Not stated	5	1	6
Total no of Victims	96	42	138

Samples Mean age = 30

Fig. 1: Site of Injuries in 138 patients



Anatomical Distribution of Injury Sites in 138 Patients

Table 2: Status of Victim

Status	Victim	%
Rider	73	52.8
Passenger	51	36.95
Pedestrian	14	10.1
Not stated	1	0.7
Total	138	100

Table 3: Nature of Accident

Nature	Victim	%
Collision with car lorry	50	36
Fall/loss of control	19	14
Collision with another motorcycle	9	7
Collision with pedestrian	8	6
Foot trapped in wheel	7	5
Not Stated	45	32
Total	138	100

**Table 4: Type and Distribution of Injuries in 138 patients**

Type	Total no	Rider (No/%)	Passenger (No/%)	Pedestrian (No/%)
Soft tissue Injuries mild/moderate (abrasions, bruises and laceration)	82(59.4)	36(26)	39(28)	7(5)
Bone and joint injuries (closed and open fractures dislocations and haemarthrosis)	37(27.1)	28(20)	8(5.7)	1(0.72)
Craniocephalic injuries CGS $\geq$ 11 (mild to moderate)	12(8.7)	8(5.8)	1(0.72)	3(2.17)
Blunt chest injuries	3(2.17)	1(0.72)	2(1.4)	-
Burns (from exhaust pipe)	3(2.17)	2(1.4)	1(0.72)	-
Spinal injury (Paraparesis)	1(0.72)	1(0.72)	-	-
	138(100)	76(54.6)	51(36.5)	11(7.9)

automobile (36%), while a significant 14% was caused by a fall or loss of control without collision (see Table 3).

Riders and passengers suffered mild and moderate soft tissue injuries in about equal proportion but there was a clear preponderance of the number of riders who sustained bony and joint injuries and head injuries (as seen in Table 4) with 76% and 67% respectively of the total number of skeletal and head injured patients. A significant 36.5% of the total number of MCA in the year under review sustained injuries within the campus.

## DISCUSSION

The use of motorcycles ('okada') as a commercial transport system in Nigeria may have been borne out of economical and social necessity to stem the lingering transport problem experienced by commuters. Similarly too, the lack of regulated bus or taxicab transport system in the university communities, has made okadas a convenient and useful substitute in the campuses.

Statistically, motorcycle accidents now contribute significantly between 10.1% to 13.1% of total road traffic accidents (RTA)<sup>2,3,5</sup> in recent years because motorcycles are now increasingly used as commercial vehicles in cities and towns. In this study, MCA patients constituted 14.1% of 918 RTA patients. The injury distribution (fig 1), similar to RTA showed an overall major involvement of extremities (67%), especially of the lower limbs<sup>11</sup>. The majority of the injuries were mild to moderate soft tissues injuries (lacerations and bruises) (82%) and about 37% had serial fractures and dislocations. More riders presented with fractures than passengers and pedestrians.

In contrast with most clinical statistical survey of severe head injuries with its attendant high mortality rate in MCA<sup>5,8</sup>, this

series recorded a low rate of mild head injury (12%) with no mortality. The high morbidity and mortality often seen with MCAs are cases of accidents occurring in intercity or intracity highways. In these cases, the motorcycle riders often ride above speed limits and passing vehicles on shoulder or passing between lanes, often ending with serious accidents which often results into high energy transfer injuries, associated with high morbidity and mortality rate. The high risk of sustaining fatal head injuries from collision and crashes informed the popular advocacy for promulgating protective crash helmet laws in most countries including Nigeria<sup>5,6,10</sup>.

Given the low incidence of head injury (12%) in our series, with an average Glasgow coma scale (GSC) of about 11, and no mortality, one could argue that legislation on compulsory use of crash helmet laws for campus riders may not be a priority step in preventing severe injuries with MCA in campuses as advocated by many protagonists and government.

Collision with automobiles rank highest among the causes of motorcycle accidents (36%) and not insignificantly, the second common cause of accident was a fall or loss of control without collision (14%). The latter cause of MCA in this review may be attributed to poor basic riding knowledge of the motorcycle, on the part of the riders, which is usually sine qua non for safety and sanity on roads. Some other contributory factors may include poor vehicle maintenance, lack of concentration and/or undisclosed or unestablished medical problems on the part of the rider.

A reassuring fact to campus commuters from this study was the fact that passengers and pedestrians sustained far less injuries in an event of accident compared to the riders.

Since the overall injury severity pattern reflected a low energy

transfer type characterized mostly by mild to moderate soft tissue wounds and fractures, we postulate that some conducive university campus environmental factors may have been responsible for the relatively mild to moderate injuries records with campus MCA. These are borne out of the following observation that the campus okada men appear to drive within speed limits, they neither have to contend with fast moving impatient automobiles, nor do they have long fatiguing mileage to cover to reach their destinations. Campus network roads are good, wide, often well maintained and with judicious use of speed brakes to slow down traffic. The general community is serene and civil; these factors we think may have generally created a very low stress operating condition for motorcycle men in campus. Nevertheless, the morbidity from MCA in campus is still relatively high for an academic community.

In conclusion, some of the injuries sustained in this investigation could be prevented if the university operated a regulated motorcycle transport system, where there is a regular check on their driving competence, arranging better and safer driving instruction and legislating and enforcing safety rules. Significant morbidity can be reduced by introducing simple but safe mode of dressing to both riders and passengers. This may be by way of providing protection to upper and lower limbs by wearing long sleeved cord fabric shirts or jackets and jeans trousers with laced covered shoes. Distinct pedestrian walkways should be built and its use by pedestrians encouraged. The use of crash helmet, from this investigation, although desirable its importance may well have been overemphasized as a priority protective device for 'okadamen' at least not for university campus operators.

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