ESTIMATING ROAD TRAFFIC ACCIDENTS AND INJURIES IN ENUGU NIGERIA

[1]Katchy Amechi Uchenna, [2]Duru Ndubusi, [3]Katchy Somtochukwu

[1] *Department of Orthopaedics /Traumatology National Orthopaedic Hospital Enugu Nigeria.*

[2]*Department of Accident & Emergency University of Nigeria Teaching Hospital Enugu Nigeria.*

[3] *Davidson & Judith Consultants Clinics Enugu*

ABSTRACT

Background: Road traffic injuries are a growing public health and development problem1. In this paper, we examined the trend and impact of road traffic injuries using evidence from our hospital records. This evidence shows how serious the problem of road traffic injuries is at present and indicates that it will become worse if no appropriate action is taken.

Methods: Case notes of patients with Road Traffic Accident (RTA) admitted at National Orthopaedic Hospital Enugu, (NOHE) which is a regional Trauma Centre in Nigeria between Jan 1 2011 and January 1 2015 were retrieved and analyzed.

Result: There were a total of One Thousand Nine Hundred and Six (1906) victims with a total of One Thousand Six Hundred and Seventy Seven (1677) admissions. There were One Thousand Four Hundred and Nine (1409) males and Four Hundred and Ninety Seven (497) females with a male: female ratio of 2.8:2. One Thousand Six Hundred and Eighty Six (1686) victim's accident occurred within the city while two Hundred and Twenty (220) victims had their accident intercity. 9 An analysis of the occupation of the victims showed students to be the most vulnerable group with motorcycle as the victims' mode of transport. Most of these accidents occurred in months of May and June with a second peak occurring within March and April and these periods correspond with the period of students' end of session exams and Easter festivities. Most of our patients had no pre-Hospital treatment before arriving as a result of our inadequate health system and victims were rescued by passers-by using commercial vehicles as a mode of transport.

Conclusion: We therefore recommend the following: development of infrastructure in academic institutions in this country to reduce the incidence of students travelling from various areas of abode in busy city centers to places of lectures, consideration of regulation such as speed limit, protective gear, road signs, training and retraining of Federal road safety corps members as first responders

Keywords – Developing Country, Magnitude, Mitigation ,Road Traffic Injuries, Public Health

NigerJmed2018: 107-113

INTRODUCTION

Road traffic injuries are a growing public health and development problem[1]. In this paper, we examined the trend and impact of road traffic injuries using evidence from our hospital records. This evidence shows how serious the problem of road traffic injuries is at present and indicates that it will become worse if no appropriate action is taken.

This paper intends to describe the magnitude and trends of road traffic injuries in our own environment; discuss the socioeconomic and health burden of road traffic injuries; and recommend ways of preventing Road Traffic Injuries (RTI) and improving outcome of injuries.

PATIENTS AND METHOD:

Case notes of patients with Road Traffic Accident (RTA) admitted at National Orthopaedic Hospital Enugu, (NOHE) which is a regional Trauma Centre in Nigeria between Jan 1 2011 and January 1 2015 were retrieved and analyzed collecting data on: Age, Sex, Occupation of victims, Type of accident, Mode of transport, Mechanism and Time of accident, cost of hospital treatment, Time of reporting to hospital, pattern of injury sustained and outcome of treatment. The research and ethics committee approval was obtained for the research.

Correspondence to: Dr .A.U. Katchy
Department of Accident & Emergency
University of Nigeria Teaching Hospital Enugu
E-mail: uchekatchy@yahoo.com
Phone No: +234 803 310 1717

RESULTS

General Information (Table 1):

There were a total of One Thousand Nine Hundred and Six (1906) victims with a total of One Thousand Six Hundred and Seventy Seven (1677) admissions. There were One Thousand Four Hundred and Nine (1409) males and Four Hundred and Ninety Seven (497) females with a male: female ratio of 2.8:2. One Thousand Six Hundred and Eighty Six (1686) victim's accident occurred within the city while two Hundred and Twenty (220) victims had their accident intercity.

Patients spent an Average of 17.59 days on Admission with a Range 1-90 days cost of treatment for all the total number of patients during that period is Fifty Four Million One Hundred and Eighty Three Thousand Naira, Three Hundred and Forty Four Thousand Forty Four Kobo (N54,183,344.44).The bill Range was N1,050 to N186, 790 and the Average hospital bill settled by the patients was N28, 427.78

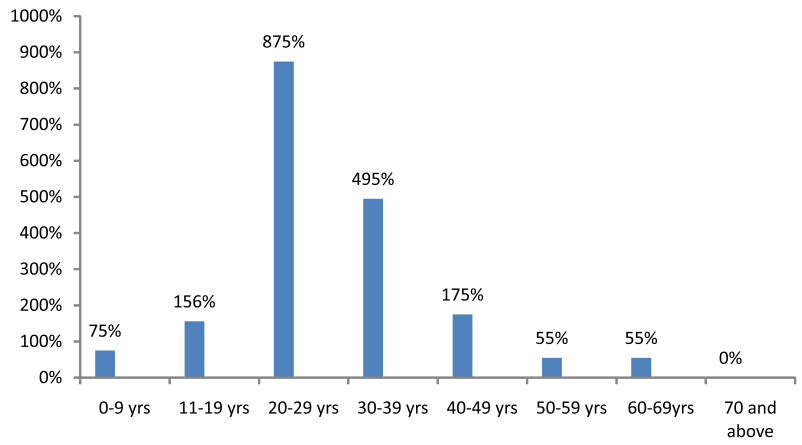
Table1: General Information

Number of patients:	1906
No of Admissions:	1677
Mean Age (in yrs)	24.14
Scene of Accident:	
Intercity	229
Within city	1677
Gender	
Male	1409
Female	497
Male: Female Ratio:	2.82:1
Days on Admission	
Total Number of days on admission	33,514 days
Mean number days on admission	17.59days
Range	1-90days
Cost of Treatment	
Total of Hospital bills settled	N54,183,344.44(361,222.30 USD)
Hospital bills Range	N1,050-N186,790
Mean hospital bill	28,427.789(190USD)
Nigeria GDP	725.30USD

Age Distribution of victims

The age group and frequencies as shown in Fig 1 were as follows: 0-9(75), 11-19(156), 20-29(875), 30-39 (495), 40-49 (175), 50-59 (55), 60-69 (55), 70 and above (0).

Figure 1: Age Group: Road Traffic Accidents Seen at National Orthopaedic Hospital Enugu



Occupation of Victims

The occupations of victims were as follows: Teachers 80 (4%), Students 668 (35%) Civil Servants 172 (9%), Traders 208 (11%), Technicians 98 (5%), Security Agents 97 (5%), Agricultural workers 120 (6%), Artisans 120 (6%), Road transport workers 267 (14%), Professionals 64 (3%), Unemployed 13 (1%)

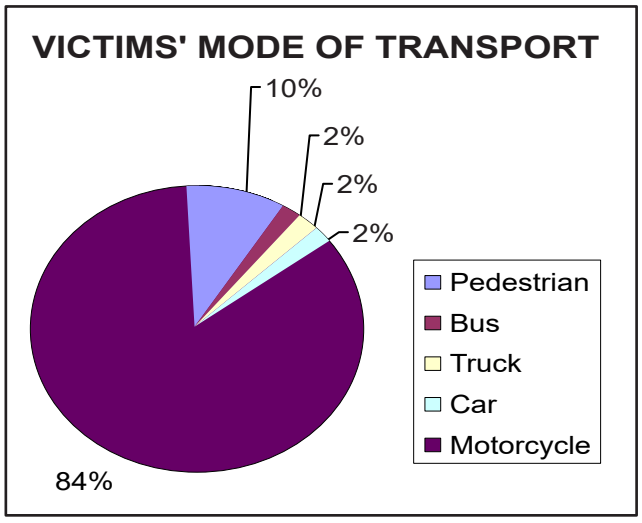
Table 2: Occupation of Victims

Occupation	No	Percentage (%)
Student	668	35
Road transport workers	267	14
Trader	208	11
Civil Servant	172	9
Agricultural	120	6
Artisans	120	6
Security Agents	97	5
Technicians	98	5
Teacher	80	4
Professionals	64	3
Unemployed	13	1
TOTAL	**1906**	**100**

Victims Mode of Transport

The Mode of transport of the victims was as follows: pedestrian 187(10%) Bus 37(2%) Truck 37(2%) Car 37(2%) Motorcycles 1607 (84%)

Figure 2: Victims Mode of Transport



Pre Specialist Hospital Treatment (Table 3)

The victims received treatment before coming to the specialist hospital as follows: on site, 19 (1%), General hospital, 112 (6%) Teaching hospital, 75 (4%), Private hospital, 446 (23%), Traditional Bone Setters 56 (3%) Faith Based Organization 45 (2%) None 1153 (61%).

Table 3 : Pre-Specialist Hospital Treatment

Institution	No	Percentage
None	1153	61
Private	446	23
General	112	6
Teaching	75	4
Traditional	56	3
Faith Based Organization	45	2
On site	19	1
TOTAL	**1906**	**100**

Mechanism of Accident

The mechanism of accidents was as follows Knocked down (sitting on a motorcycle): 746(39%), Head on Collusion: 513(27%), Crashing into environment: 318(17%), Knocked down (pedestrian): 187(10%), Somersault: 7(4%), Burst tire: 38(2%), Ejection from the vehicle: 10(1%), Not stated:20(1%),

Table 4 : Mechanism of Accident

Mechanism	No	Percentage (%)
Knocked down (sitting on a motorcycle)	746	39
Head on Collusion	513	27
Crashing into environment	318	17
Knocked down (on foot)	187	10
Somersault	75	4
Burst tire	38	2
Ejection from the vehicle	10	1
Not stated	20	1
TOTAL	**1906**	100

Rescue Group

Victims were rescued from the scene by the following: Federal Road Safety Commission, 38 (2%) Police, 37 (2%) Passers by 1775 (93%) fellow passengers 56 (3%)

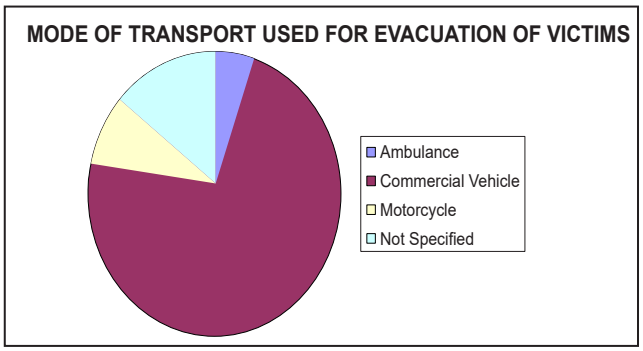
Table 5: Rescue Group

Rescuer	No	Percentage (%)
Passers by	1775	93
Fellow passengers	56	3
FRSC	38	2
Police	37	2
TOTAL	**1906**	**100**

Mode of Transport Used for Evacuation of Victims

The mode of transport used in evacuation of accident victims as shown in Fig 3 were as follows: Ambulance, 109 (6%) Commercial vehicle, 1361 (71%), Motorcycle, 164 (9%), Not specified, 273 (14%)

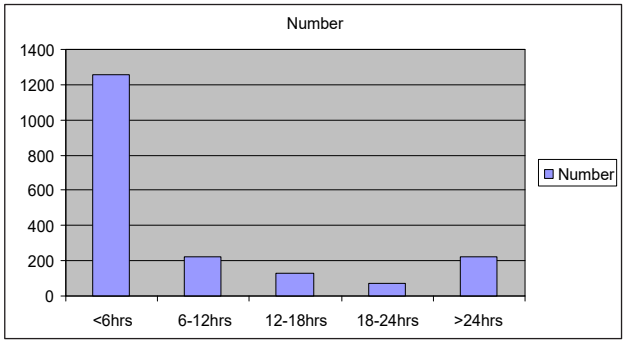
Figure 3: Mode of Transport of Evacuation of Victims



Time of Reporting of Accident Victims

The time of reporting of accident victims shown in Fig 4 were as follows: less than 6 hrs, 1253 (65.8%) 6-12 hrs 224 (11.8%), 12 – 18 hrs, 131 (6.9%), 18-24 hrs, 75 (3.9%), more than 24 hrs, 223 (11.7%)

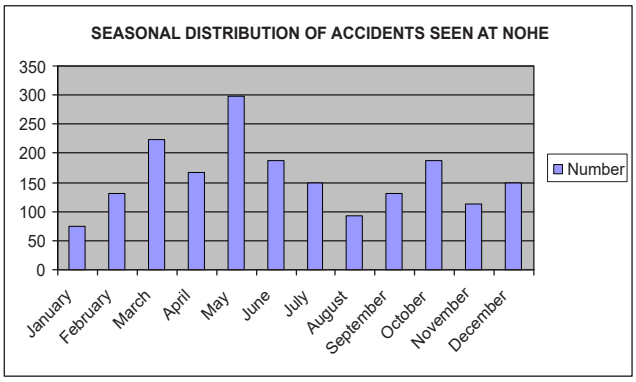
Figure 4: Time of Reporting Accident Victims At NOHE



Seasonal Occurrence of Accident

The months of occurrence of crashes as shown in Fig 5 are as follows: Jan, 75 (3.94%), Feb. 131 (6.87%), March 224 (11.75%), April, 1168 (61.28%) May, 299 (15.69%), June, 187 (9.81%) July, 149 (7.82%) Aug, 93 (4.88%) Sep, 131 (6.87%), Oct, 187 (9.81%), Nov, 112 (5.88%), Dec, 150 (7.87%)

Figure 5: Seasonal Occurrence of Accident



Pattern of Injuries Sustained

There were a total of three Thousand Eight Two (3082) Injuries as shown in Table 6 distributed as follows: upper limb, 598 (19.4%) Neck, 19 (0.6%) Lower limb, 1831 (59.4%) Face, 149 (4.8%) Trunk, 19 (0.6%) Chest 19 (0.6%) Head 318 (10.3%) Pelvis 37 (1.2%) Abdominal 75 (2.4%) Spinal 19 (0.6%)

Table 6: Pattern of Injuries Sustained

Injuries sustained	No	%
Lower limb	1831	59. 4
Upper limb	598	19.4
Head	318	10.3
Face	149	4.8
Abdominal	75	2.4
Pelvis	37	1.2
Neck	19	0.6
Trunk	19	0.6
Chest	19	0.6
Spinal	19	0.6
TOTAL	**3082**	**100.0**

Outcome of Injuries

The outcomes of the patients' treatment as shown in Table 7 were as follows: Deformity 14 (7.8%) permanent paralysis, 131 (6.9%) Still attending hospital, 149 (7.8%) Died, 19 (0.01%), Discharged home, 1458 (76.5%)

Table 7: Outcome of Injuries

Outcome	No	%
Discharged home	1458	76.5
Deformity	149	7.8
Still attending hospital	149	7.8
Permanent paralysis	131	6.9
Died	19	0.01
TOTAL	**1906**	**100.0**

DISCUSSION

Developing countries have been experiencing in large numbers the epidemic of Road Traffic Crashes and injuries. [2,3,4] The reasons adduced by some authors [5,6] for the high burden of road traffic injuries in developing countries are: growth in the numbers of motor vehicles; higher number of people killed or injured per crash in low-income countries, poor enforcement of traffic safety regulations; inadequacy of health infrastructure, and poor access to health care. Most of our victims are within the second and third decades of their lives in keeping with the findings of similar studies. [7,8.9]

This is the active and productive period when people are in quest for life ambition during which many may find themselves using the roads quite often. The male/female ratio observed in this study was 2.8:1. Many authors [6,7,8,9] have also noted this predominance in their studies. This may be due to the fact that females lead a less active life and mostly remain indoors.[10]

An analysis of the occupation of the victims showed students (35%) to be the highest group followed by traders (14%) and the road transport workers (11%). We observed that due to lack of hostel accommodation on many campuses most students commute from their various accommodations in cities through the busy highways to various lecture venues and this no doubt increased their vulnerability to RTA. The nature of the occupation of traders and road transport entails their being on the road quite often. This is at variance with findings of Nilambra et al[11] whose largest group was labourers. In our country poor infrastructure development of Nigerian academic institutions where these are sited without hostel with many students living off campus have led to students traveling from one end of the city to another on motorbikes to attend lectures. Akinpelu[12] et al have also reported a high incidence of RTA amongst students in the western part of Nigeria.

The major mode of transport among victims was motorcycle which constituted about 84%. In Nigeria poor network of roads have led to emergence of commercial motorbikes popularly called Okada as the main means of transport both for the rich and the poor. More so, operators of these motorbikes are not tutored on driving and road safety rules.

Most of our patients (39%) were knocked down while sitting on a motorbike followed by those who had head on collusions as occupants of buses and cars . Odelowo [13] and Falope[14] have also shown in their various studies the emergence of motorcycle accidents as a group of road traffic accident victims with increasing importance in this environment.
Akinpelu et al[12] attributed this to the rising usage of motorcyclists who do not obey traffic regulations and they suggested the need for a study to determine the factors that modify the behavior of these motorcyclists.

Sixty one percent (61%) of our patients had no Pre Hospital treatment before arriving. This is as a result of our inadequate health system which is yet to come to terms with the role of Pre Hospital care in reducing road accident mortality.

Ninety three percent (93%) of victims were rescued by passersby using commercial vehicles as a mode of transport. In Nigeria there are no functional public ambulance systems and the few purchased by some state governments in other to score cheap political points are not manned by trained personnel. In addition to this, national agencies the police and Federal Road Safety Commission (FRSC) who statutorily have major roles to play in our highways have not really lived up

to expectations in accident victims management as shown in our study where they did only evacuated about 2%.

Despite these draw backs most of the patients reported to the NOHE less than six hours after the accidents. This could be attributed to the fact that our centre is situated on a major highway and is easily accessible. Secondly, most of the accidents occurred within the city.

Seasonal occurrence of accidents showed that most occurred in months of May/June with a second peak occurring within March/April. The May/June period corresponds with the students' end of session exams while the March/April period corresponds with the Easter season which is a major period of festivity in the East of Nigeria. There is no doubt that this is the period of profound activities involving the vulnerable group.

Pattern of injuries sustained showed that there were more injuries involving the extremities than any other anatomical region with a predilection for the lower limb (56.4%). There is an explanation for this being that most motorbike accident victims are unprotected occupants with the limb exposed[15,16]. It is also possible that because ours is a major orthopedic centre there is a possibility of selective referrals by the onlookers and hospitals.

Most of our patients were discharged home and we had a very low mortality. Pattern of injury is a major contributory factor to our good outcome. In 2005 Nigeria's GDP per capital was only $725.30, among the lowest in the world and well below the average for sub-Saharan Africa. There is no doubt that for an average individual to spend $190 on treatment of injuries is quite on the very high side. It is important to point out that this is the cost of bill settlement only. Therefore, it is important that a study is carried out to estimate the financial burden on families of road Traffic Accident victims.

CONCLUSION

The magnitude and trend of road traffic injuries in our environment shows that most of our victims were students within the second and third decades of their lives. Motorcycle was most implicated as the mode of transport for victims. Most of these accidents occurred in months of May and June with a second peak occurring within March and April and these periods correspond with the period of students' end of session exams and Easter festivities. Most of our patients had no pre-Hospital treatment before arriving as a result of our inadequate health system and victims were rescued by passers-by using commercial vehicles as a mode of transport.

We therefore recommend the following:

1. Encouragement of commercials/ adverts on how to offer rescue/first aid to the public since they are the most first responders as shown in our study?
2. Development of hostel infrastructure in academic institutions in this country to reduce the incidence of students' travels on our highways in a bid to attend lectures
3. Outright ban of motorcycles as means of public transport using adequate legislations.
4. Establishment of proper pre hospital care system with a proper functioning public ambulance system
5. Consideration of regulation such as speed limit, protective gear, road signs, training and retraining of Federal road safety corps members as first responders

ACKNOWLEDGEMENTS

We are grateful to the staff of the Medical Records of National Orthopaedic Hospital Enugu for all their assistance during record retrieval.

REFERENCES

1. Peden M et al. World report on road traffic injury prevention 2004. Geneva: World Health Organization, 2004.

2. *Rodriguez DY, Fernandez FJ, Velasquez HA*. Road traffic injuries in Colombia. *Injury Control and Safety Promotion 2003*; 10:*29-35*.
3. Afukaar FK, Antwi P, Ofosu-Amah S. Pattern of Road Traffic Injuries in Ghana: Indications for Control. Injury Control and Safety Promotion 2003; 10: 1-2 69-79.
4. Odero W, Khahesi M, Heda PM. Road Traffic Injuries in Kenya: Magnitude, Causes, Status of Intervention. Injury Control and Safety Promotion 2003; 10(12): 53-61.
5. Nantulya MV, Reich MR. The neglected epidemic: road traffic injuries in developing countries. British Medical Journal 2002; 324: 1139-1141.
6. Jha N, Road traffic accidents cases at BPKIHS, Dharan, Nepal, One year in retrospect. Journal of Nepal Medical Association 1997; 35: 241-244.
7. Mehta SP. An epidemiological study of road traffic accident cases admitted in Safdar Jang Hospital, New Delhi. Indian Journal of Medical Research 1968; 56(4): 456-466.
8. Ghosh PK. Epidemiological study of the victims of vehicular accidents in Delhi. Journal of Indian Medical Association 1992; 90(12): 309- 312.
9. Chulin C, Huichun W, Xiaohong S. The investigation and analysis of 1000 cases of traffic injury emergency treatment in five cities in China. In: proceedings of the International Conference on Traffic Safety 27-30 January 1991. New Delhi. India.
10. Singh R, Singh HK, Gupta SC, Kumar Y. Pattern, severity and circumstances of injuries sustained in road traffic accidents: a tertiary care hospital-based study. Indian J Community Med. 2014 Jan;39(1):30-4. doi: 10.4103/0970-0218.126353.
11. Nilambra J, Chandra SA. Epidemiological Study of Road Traffic Accident Cases: A Study from Eastern Nepal: Regional Health Forum WHO South-East Asia Region Volume 8 Number 1, 2004.
12. Akinpelu OV, Oladele AO, Amusa YB, Ogundipe OK, Adeolu AA, Komolafe EO. Review of Road Traffic Accident Admissions in a Nigerian Tertiary Hospital. East and Central African Journal of Surgery 2007; 12(1): 63-67.
13. Odelowo EO. Pattern of Trauma resulting from motorcycle accidents in Nigerians: a two-year prospective study. African Journal of Medical Sciences 1994; 23: 109-112.
14. Falope IA. Motorcycle accidents in Nigeria: A new group at risk. West African Medical Journal 1991; 10: 187-189.
15. Varghese M, Mohna D. Transportation injuries in rural Haryana, North India. In: Proceedings of the International Conference on Traffic Safety 27-30 January 1991, New Delhi, India.
16. Sathiyasekaran BWC. Study of the injured and the injury pattern in road traffic accidents. Indian Journal of Forensic Sciences 1991; 5: 63-68.