

## **Relationship between Road Traffic Accidents and Visual Status of Commercial Motor Vehicle Drivers in an Urban Area of Niger Delta Region of Nigeria**

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### **Authors' contributions**

*This work was carried out in collaboration between both authors. Author CSE designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Author GFP managed the analyses of the study and the literature searches. Both authors read and approved the final manuscript.*

### **Article Information**

DOI: 10.9734/OR/2019/V10i130099

#### Editor(s):

- (1) Dr. Stephen G. Schwartz, Department of Clinical Ophthalmology, Bascom Palmer Eye Institute, University of Miami Miller School of Medicine, USA.  
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(3) Maria Alzete de Lima, Federal University of Rio Grande do Norte, Brazil.  
Complete Peer review History: <http://www.sdiarticle3.com/review-history/47931>

**Original Research Article**

**Received 13 January 2019**

**Accepted 22 March 2019**

**Published 04 May 2019**

### **ABSTRACT**

**Aim:** To determine the relationship between visual status of commercial motor vehicle drivers and road traffic accidents (RTA) in an urban area of Niger Delta, Nigeria.

**Methods:** Four hundred commercial vehicle drivers in the 10 major motor parks of Port Harcourt LGA were interviewed and examined in this study. A structured questionnaire on demographic characteristics, driving and ocular history was administered. Ocular examination included visual acuity, refraction, visual field, tonometry, colour vision test and ophthalmoscopy. The data collected was entered into computer using EPI-INFO statistical software for analysis. Ethical approval was obtained from relevant authorities.

**Results:** Seven drivers (1.8%) out of 400 drivers examined were visually impaired. There were 14 cases (3.5%) of monocular blindness. Eighteen (4.5%) were colour blind ( $p>0.05$ ) while 16 (4%) had visual field defects ( $p>0.05$ ). One hundred and eighty two (45.5%) drivers had been involved in

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RTA, out of which 2 drivers (1.1%) were visually impaired ( $p>0.05$ ). Cataract found in 37 cases was the leading cause of visual impairment (42.8%). Other common ocular problems were pterygium (26.7%), presbyopia (22.9%), glaucoma (11.5%), and refractive error (8.4%). There was no statistical significant association between the ocular findings and RTA

**Conclusion:** Only a few of those involved in RTA were actually visually impaired. Therefore, other factors may have been responsible for the majority of the cases of the RTAs in this study necessitating the need for more research.

*Keywords: Visual status; road traffic accident; commercial drivers; Niger Delta.*

## 1. INTRODUCTION

The motor vehicle is necessary for people and goods to be conveyed from one point to another and the commercial motor vehicle drivers are important in accomplishing this.

Nearly every decision or action that is made while driving is based on what a person sees [1].

Vision is one of the fundamental ways we perceive and respond to stimuli all around us. It dynamically involves sight, knowledge, and reaction. Sight, a receptive ability and an acuity measurement allows one the ability to clearly see a target at a particular distance.

For a driver to obey all traffic laws and be prepared to react to other drivers and driving conditions he has to have good visual acuity, good stereopsis, normal colour vision, satisfactory eye co-ordination and the ability to adapt to various levels of illumination are essential to the driver [2].

A collision of motor vehicles with each other, houses and electricity poles can result in a mishap known as road traffic accidents (RTA).

The causes of road traffic accidents are however multifactorial; these are related to roads, road signs, vehicles and road users. The human elements play major roles in the aetiology of RTA. These include deplorable habits of drivers due largely to inadequate training, inattentiveness, alcoholic intoxication, drug intake, excessive speeding, wrong overtaking, poor knowledge of traffic regulations, and physical disability, an example of which is poor vision [3,4]. However it is a well-known fact that for one to successfully drive a motor vehicle, good vision is required. Furthermore, with advancement in age, there is increased incidence of certain eye diseases such as cataract, open angle glaucoma, and age related macular degeneration in the general population and the commercial drivers are not exempted [4].

Around the world, road traffic accidents are a major public health challenge that requires concerted efforts for effective and sustained prevention. An estimated 1.2 million people are killed in road traffic accidents (RTA) every year and as many as 50 million suffer injuries<sup>3</sup>. The World Health Organization (WHO) estimates that these figures could increase by more than half over the next 20 years unless there is a firm commitment to road safety and accident prevention especially in developing countries such as Nigeria [5]. These figures therefore triggered the issue of prevention of road traffic accident as a global priority by the World Health Organization [5,6]. This has caused a decline in road traffic accidents in majority of industrialized countries. However the reverse is the case in the developing nations [7].

In Nigeria, the mortality from road traffic accidents when compared with some countries ranked the highest [8,9]. These accidents apart from causing deaths result in disability and disfigurement for life. They also cause decrease in the labour force as young people (aged 15-30 years) belong to the group mostly affected [10]. The police records show that between 2000 and 2004, a total of 36,000 Nigerians died and 125,000 were injured in road traffic accidents (RTA) [3]. A study has shown that 1 out of 3 and 1 out of 9 of the Nigerian population stand the risk of getting injured or killed respectively, on a yearly basis from RTA [8].

Road traffic accidents apart from their impact on human life also drain the meager resources of hospitals and adversely affect government properties such as bridges and electric poles amounting to loss of huge sums of money. Thus, the cost of road traffic accidents is therefore measured both in terms of money and life, which has far reaching effects on family life and economic development of Nigeria [11].

In view of the magnitude and impact of road traffic accidents, the Federal Road Safety

Commission (FRSC) was established by the Federal Government vide Decree 45 of 1988 as amended by Decree 35 of 1992 but effective 18<sup>th</sup> February 1988. This was in keeping with the World Health Organization suggestions on road safety [5,6]. The Commission was charged with responsibilities such as policy making, organization and administration of road safety in Nigeria among others.

The FRSC [12] in 1990 introduced the minimum acceptable levels of vision for both private and commercial drivers. For private motor drivers, visual acuity of at least 6/12 in the better eye and 6/36 in the poorer eye while for commercial drivers, the minimum visual acuity would be 6/9 in the better eye and 6/24 in the poorer eye with or without glasses. The FRSC also laid down minimum standards for a driving license to be obtained [12]. These include driving school attendance, possession of a learner's permit, evidence of having passed a driving test carried out by a Vehicle Inspection Officer (VIO), knowledge of the Highway Code, ability to read all road signs and passing an eye test.

It is therefore necessary to carry out an assessment of the visual status of commercial motor vehicle drivers since they play a large role in mass transportation in Nigeria. This assessment will enhance the policy guideline on who is fit to drive a motor vehicle and also to improve safety on Nigerian roads.

## 2. METHODS

This study was a Cross Sectional Observational research design of randomly selected subjects.

Four hundred commercial vehicle drivers in the 10 selected major motor parks of Port Harcourt

Local Government Area were interviewed and examined in this study.

They were all males above 60 years (with only 5 above) and majority only had primary school education.

A structured questionnaire on demographic characteristics, driving and ocular history was administered to the drivers.

Ocular examination included visual acuity with standard Snellen's chart, refraction with auto refractor, visual field with Humphrey's perimeter, intra ocular pressure with Perkin's tonometer, colour vision test with Ishihara chart and funduscopy with Welch Allen's ophthalmoscope. All examinations were carried out using standard procedures.

The data collected was entered into the computer using EPI-INFO 2007 statistical software. The relationships between categorical data were analyzed using Chi square test. At the adopted confidence level of 95%, P value of less than 0.05 was considered to be significant.

Approval for this study was granted by the National Postgraduate Medical College of Nigeria and Ethical clearance and certification obtained from the Research and Ethical Committee of University of Port Harcourt Teaching Hospital, Port Harcourt.

There are no conflicting interests and all financial responsibilities were borne by the researchers.

## 3. RESULTS

Four hundred drivers were examined. Majority of the drivers (300) were minibus drivers and all were males aged between 20-69 years.

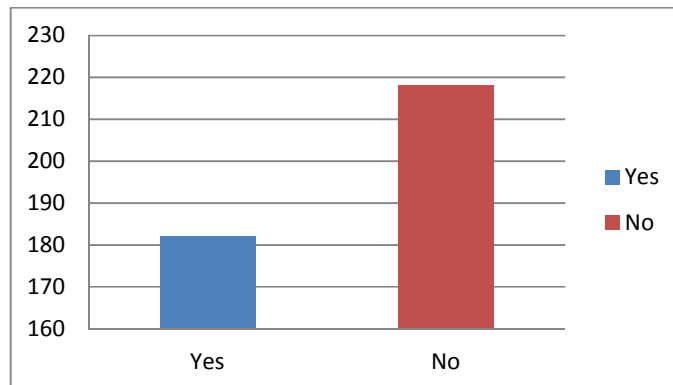


Fig. 1. Distribution of drivers involved in road traffic accidents

Fig. 1 shows that 182 (45.5%) drivers had been involved in road traffic accidents. Majority (62.5%) of these were between the ages of 30 - 49 years.

In Fig. 2, by WHO<sup>44</sup> definition, most of the drivers (98.2%) had good vision while only 7(1.8%) had impaired vision. Acuity range  $\frac{6}{6}$  -  $\frac{6}{60}$ .

Fig. 3 shows cataract as the leading cause of visual impairment in the better eyes of the affected drivers.

Fig. 4 shows the causes of monocular blindness. Of these, 50% was due to cataract, 35.7% due to

glaucoma and 7.1% for both optic atrophy and corneal opacity respectively.

Table 1 shows the relationship between visual impairment in the driver's better eye and road traffic accident. This relationship was not statistically significant.

Table 2 shows 16 (4%) of the 400 drivers had a visual field defect. There was no statistically significant relationship.

Table 3 shows 18 (4.5%) of the 400 drivers had defective colour vision. The association between colour vision defect and road traffic accident was not statistically significant.

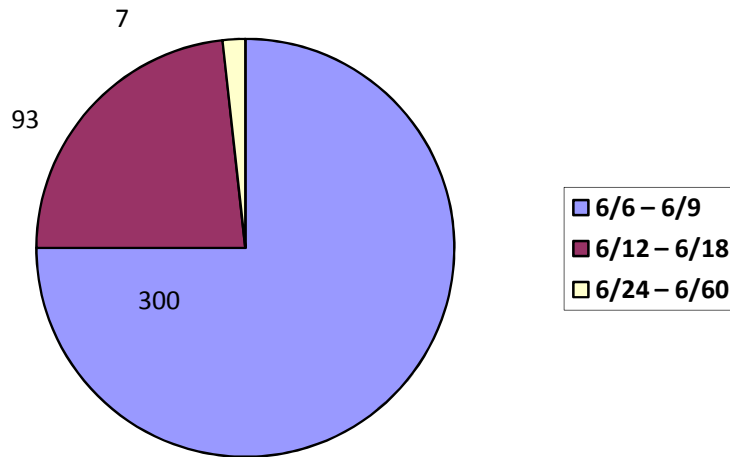


Fig. 2. Visual status in the better eyes of the 400 drivers

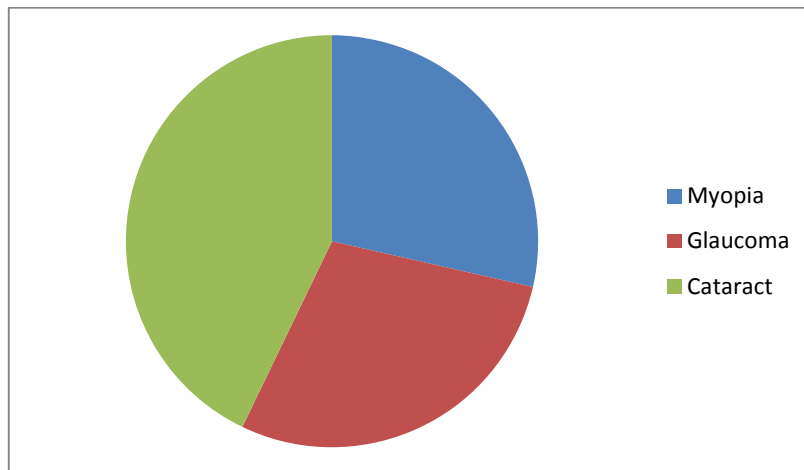
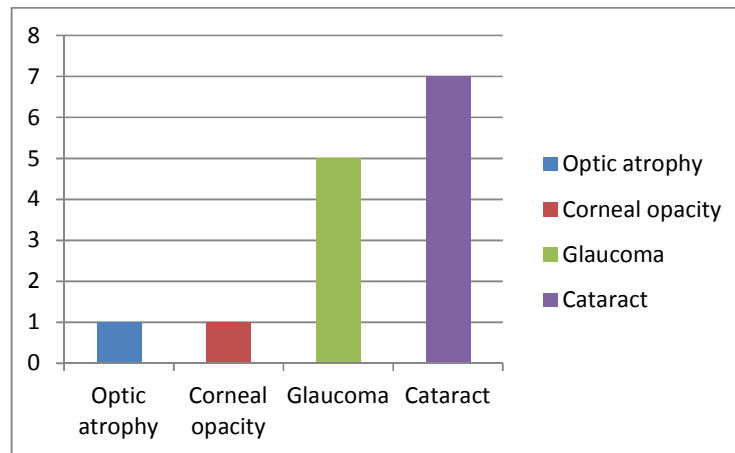


Fig. 3. Causes of visual impairment in the better eye of the 400 drivers



**Fig. 4. Causes of Monocular blindness among the 14 drivers**

**Table 1. Association between visual impairment and the 182 Drivers involved in RTA**

Visual Acuity	Drivers involved in RTA	Drivers not involved in RTA	Total
Normal	180	213	393
Impaired	2	5	7
Total	182	218	400

$X^2 = 0.3; p > 0.05; df=1; Relative Risk=0.62$

**Table 2. Association between glaucomatous visual field defect and RTA**

Visual field	Drivers involved in RTA	Drivers not involved in RTA	Total
Defect	9	7	16
Normal	173	211	384
Total	182	218	400

$X^2 = 0.78; p > 0.05; df = 1; Relative Risk = 1.25$

**Table 3. Association between Colour Vision defect (by Ishihara chart) and RTA**

Colour	Drivers involved in RTA	Drivers not involved in RTA	Total
Normal	172	210	382
Defective	10	8	18
Total	182	218	400

$X^2 = 0.77; P = > 0.05; df=1; Relative Risk = 1.23$

#### 4. DISCUSSION

Of the 400 drivers examined, 155 (38.7%) had one form of ocular complaint or the other. Although distance vision is more important for driving, presbyopic symptoms could be very distressing to some commercial motor vehicle drivers who sign movement register and other documents in Transport Companies. Cataract accounted for 14% of ocular problems seen. This is lower in another study [12]. Aging is the commonest cause of cataract. Cataract is the commonest cause of blindness in Nigeria [13],

and was the commonest cause of visual impairment in this study.

Glaucoma accounted for 11.5% of diseases seen in this study. This finding is similar to the result of Abraham [11] (10.9%). Glaucoma is the second most common cause of blindness in Nigeria [14] and was the second most common cause of visual impairment in this study.

Refractive error (excluding presbyopia) affected 8.4% of the drivers. Myopia accounted for 90.9% of cases and together with glaucoma were the second most common causes of visual

impairment in this study (Fig. 3.). Studies in Lagos [11] also showed refractive error as the second most frequent ocular finding in those drivers with low visual acuity. In this study the 'eyeglass habit' of the drivers was poor, as only 4 (1.0%) of the 400 drivers admitted to use of glasses for distant vision but these were not seen on them. Ametropia is not a common cause of blindness in Nigeria [14], but an important cause of visual impairment. Therefore appropriate optical correction is necessary for enhanced visual performance thereby meeting the legal visual requirement for driving.

In this study, association between visual impairment and road traffic accident was not statistically significant ( $p > 0.46$ ) which is similar to the findings by Adogu [12]

There was also no significant association between visual field defect and RTA. This result is in agreement with other studies done in Nigeria [2,14]. Study by Agbonkhese showed no statistically significant association between colour vision defect and road traffic accident collaborated by Agbonkhese EG. [1].

## 5. CONCLUSION

A good number of drivers who had impaired vision were not involved in RTA and their conditions were ameliorable with spectacles use. Therefore, factors other than poor vision may have been responsible for the RTAs in this study.

The relationship between visual status of commercial motor vehicles drivers and road traffic accident is not statistically significant in this study therefore further studies are needed to determine the various other causes of RTA among them.

## CONSENT

It is not applicable.

## ETHICAL APPROVAL

Ethical approval was obtained from relevant authorities. Approval for this study was granted by the National Postgraduate Medical College of Nigeria and Ethical clearance and certification obtained from the Research and Ethical Committee of University of Port Harcourt Teaching Hospital, Port Harcourt.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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