

## PREVALENCE AND CAUSES OF MONO OCULAR BLINDNESS AND VISUAL IMPAIRMENT AMONG VEHICLE DRIVERS IN PORT HARCOURT NIGERIA

GF PEPPLE<sup>1</sup>, CS EJIMADU<sup>2</sup>

### ABSTRACT

**Aim:** To determine the prevalence and causes of mono ocular blindness and visual impairment among vehicle drivers in Port Harcourt, Nigeria.

**Method:** 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.

**Result:** The prevalence of mono ocular blindness was 3.5% while that of visual impairment was 1.8% in the better eye and 8.0% in the worse eye.

The causes of monocular blindness were cataract (50%), glaucoma (35.7%), optic atrophy and corneal opacity contributed 7.1% each.

Cataract found in 37 cases was also the leading cause of visual impairment (42.8%) while other common ocular problems were pterygium (26.7%), presbyopia (22.9%), glaucoma (11.5%), and refractive error (8.4%).

**Conclusion:** A good number of drivers in this study were still driving with mono ocular blindness and visual impairment. Cataract and glaucoma being the major causes of these visual problems can be tackled by enlightenment and provision of quality eye care services. Proper supervision of vision safety regulations and enforcement of rules by the relevant authorities is recommended to avoid fatal road traffic accidents.

**Keywords:** Mono ocular blindness, visual impairment, vehicle drivers.

### INTRODUCTION

The motor vehicle is necessary for people and goods to be conveyed from one point to another and drivers are important in accomplishing this. Nearly every decision or action that is made while driving is based on what a person sees<sup>1</sup>.

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, be

prepared to react to other drivers and driving conditions and avoid accidents, 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<sup>2</sup>.

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 Road Traffic Accident. 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<sup>3,4</sup>. However

GF PEPPLE<sup>1</sup>, CS EJIMADU<sup>2</sup>

<sup>1</sup>Department of Ophthalmology, Rivers State University Teaching Hospital

<sup>2</sup>Department of Ophthalmology, University of Port Harcourt

Correspondence to: Chibuikwe Sydney Ejimadu, Department of Ophthalmology,  
University of Port Harcourt.

Email: [theraphaproject@yahoo.com](mailto:theraphaproject@yahoo.com) Phone: +234 803 875 6039

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<sup>4</sup>.

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<sup>5</sup>. These figures therefore triggered the issue of prevention of road traffic accident as a global priority by the World Health Organization<sup>5,6</sup>. This has caused a decline in road traffic accidents in majority of industrialized countries<sup>7</sup>. However the reverse is the case in the developing nations.

In Nigeria, the mortality from road traffic accidents ranked the highest when compared with some countries<sup>8,9</sup>. 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<sup>10</sup>. 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)<sup>3</sup>. 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<sup>8</sup>.

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<sup>11</sup>.

The Federal Road Safety Commission (FRSC) introduced the minimum acceptable levels of vision for both private and commercial drivers<sup>12</sup>. For private motor drivers, visual acuity of at least 6/12 in the better eye and 6/36 in the worse eye while for commercial drivers, the minimum visual acuity would be 6/9 in the better eye and 6/24 in the worse eye with or without glasses. The FRSC also laid down minimum standards for a driving license to be obtained<sup>12</sup>. 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 prevalence and causes of mono ocular blindness and visual impairment of vehicle drivers 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.

## **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, majority of them (98.7%) between 21-60 years. Only 5 were above 60 years of age.

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 at University of Port Harcourt Teaching Hospital (only for those with cupped disc of  $>0.5$  or raised intraocular pressure of  $>21$ mmHg), 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 version 4.0 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.

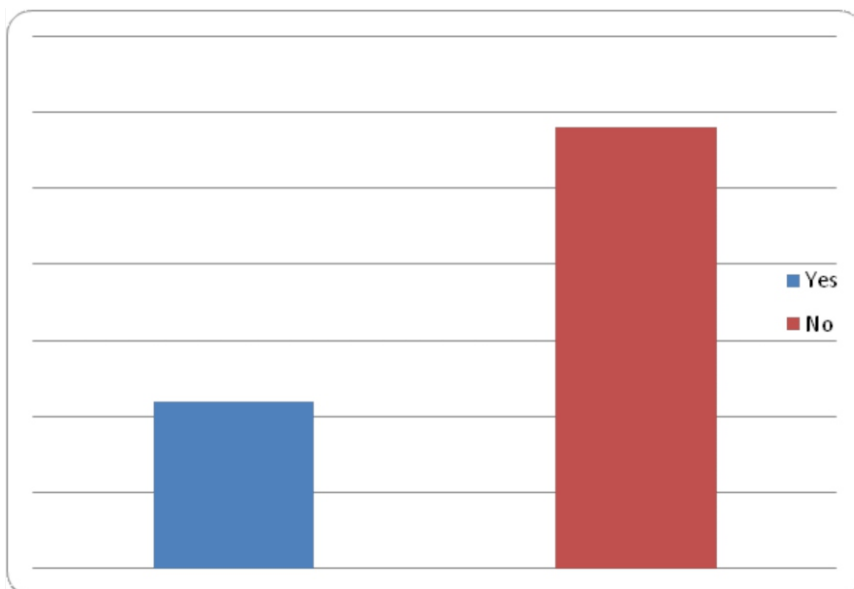
**RESULTS**

Four hundred drivers, all males aged between 20-69 years, were examined.

Table 1 shows the age distribution of the drivers. Three hundred and fifty (87.5%) drivers were less than 50 years old and two-thirds were between 30 and 49 years old. The mean age was 37.8 years with a standard deviation +- 9.1; age range 20-69 years.

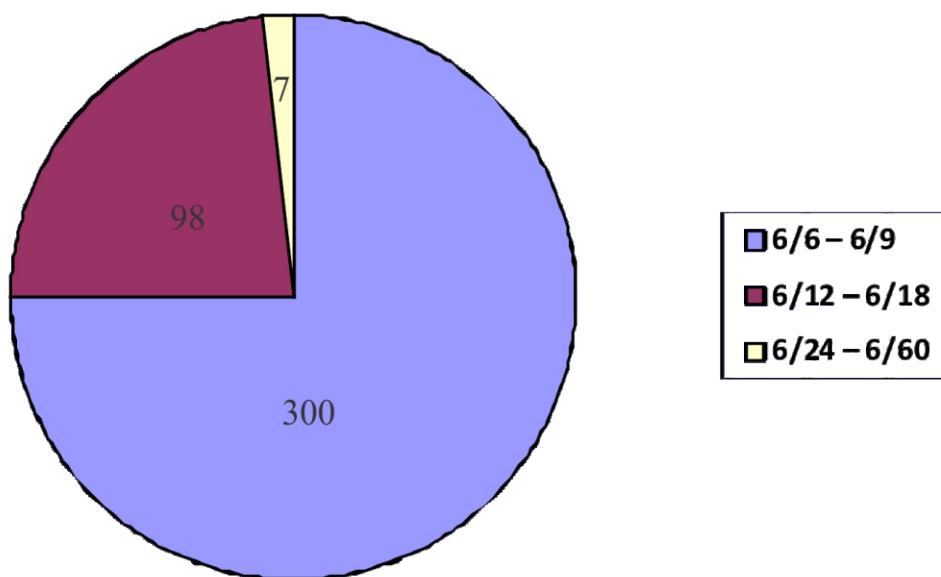
Table 1: Age distribution of the 400 drivers.

Age group (years)	Number of subjects	Percentage %
20 - 29	77	19.2
30 - 39	170	42.5
40 - 49	103	25.7
50 – 59	45	11.3
60 - 69	5	1.3
Total	400	100 %



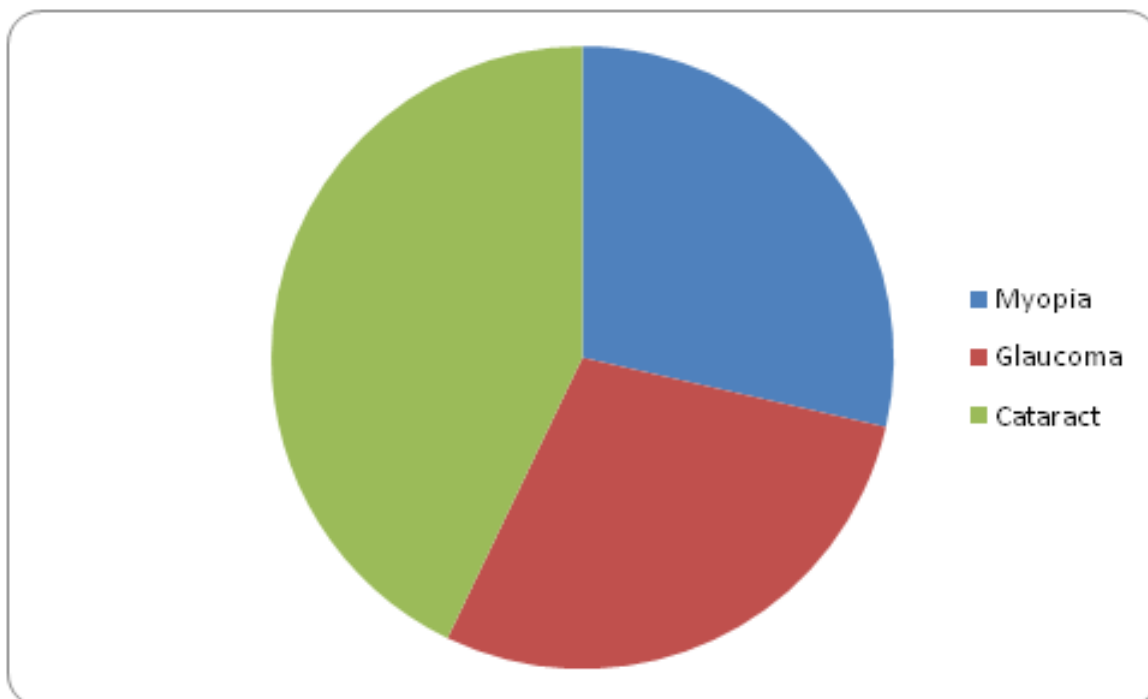
**Fig. 1: Distribution of Drivers involved in road traffic accidents**

Figure 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



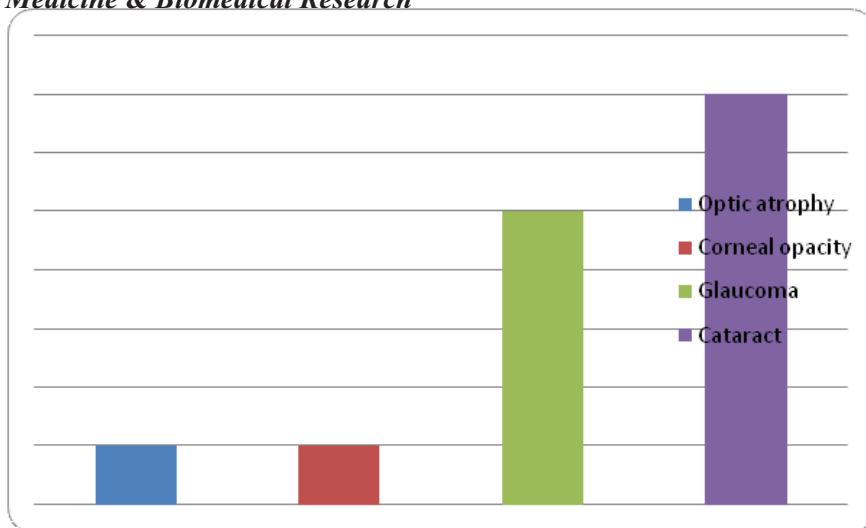
**Fig. 2. Visual status in the better eyes of the 400 drivers.**

In Figure 2, by WHO definition, most of the drivers (98.2%) has good vision while only 7 (1.8%), had impaired vision. Acuity range was between  $\frac{6}{6}$  -  $\frac{6}{60}$ .



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

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



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

Figure 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 4: WHO classification of visual impairment in the worse eye of the 400 drivers.

Visual acuity	No. of drivers	Percentage %
6/6 – 6/18	354	88.5
6/24 – 6/60	32	8.0
<6/60 – 3/60	0	0.0
<3/60	10	2.5
NPL	4	1.0
Total	400	100.0

Acuity range 6/12 - NPL

Table 4 shows that 32(8.0%) of the drivers were visually impaired in the worse eye and 14(3.5%) were monocularly blind in the worse eye. Four (28.6%) of the fourteen drivers with monocular blindness had no light perception (NPL).

**DISCUSSION**

Four hundred drivers examined in this study and the prevalence of mono ocular blindness was 3.5% while that of visual impairment was 1.8% in the better eye and 8.0% in the worse eye.

This means 1.8% of the study population was visually impaired. This is of public health importance if one goes by the World Health Organizations' standard which stated that a disease prevalence of more than 1% should be of public health concern<sup>7</sup>. This figure is

similar to the findings of Abraham 16 (1.7%)<sup>11</sup>. The study by Ejimadu<sup>13</sup> on visual impairment in some communities in Rivers State obtained a higher prevalence.

As people age, visual functions deteriorate due to increase in the incidences of age related ocular conditions such as cataract, macular degeneration and open angle glaucoma. The causes of monocular blindness include cataract (7) 50% of the cases, glaucoma (5) 35%, optic atrophy (1) and corneal opacity (1), each contributing 7.1% (figure 4). The cataracts and corneal

opacities in this study were attributed to eye injuries. This is not surprising as eye injuries have been found to be an important cause of monocular defect in Nigeria<sup>13</sup>. Trauma has also been identified as the commonest cause of monocular blindness in a similar study<sup>14</sup>. Cataract is the commonest cause of blindness in Nigeria<sup>13</sup>, and was the commonest cause of mono ocular blindness in this study in contrast to the study in Anambra State<sup>12</sup>. Glaucoma accounted for 35.7% of mono ocular blindness seen in this study. This finding is similar to the result of Abraham<sup>11</sup> (10.9%). Glaucoma is the second most common cause of blindness in Nigeria<sup>14</sup> 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. A study showed refractive error as the second most frequent ocular finding in those drivers with low visual acuity<sup>11</sup>.

## CONCLUSION

A good number of drivers in this study were still driving with mono ocular blindness and visual impairment (3.5% and 1.8% respectively). Cataract and glaucoma being the major causes of these visual problems can be tackled by enlightenment and provision of quality eye care services. Proper supervision of vision safety regulations and enforcement of rules by the relevant authorities is recommended to avoid fatal road traffic accidents.

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