

# Pattern of Eye Diseases among Commercial Intercity Vehicle Drivers in Nigeria

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## SUMMARY

**Objective:** To determine the pattern of eye diseases among commercial intercity vehicle drivers (CIVDs) in Ilorin, Nigeria.

**Design:** A cross-sectional descriptive study.

**Methodology:** Out of the estimated 450 drivers operating in the five major motor parks for CIVDs in Ilorin, 399 consecutive drivers participated in the study. Structured questionnaires were administered and ocular examinations were done.

**Results:** The common ocular conditions seen were presbyopia (28.3%), allergic conjunctivitis (22.6%), pingueculae (18.0%), ocular hypertension (8.8%), pterygium (8.3%), cataract (7.8%), and uncorrected refractive error (6.0%). Visual impairment, based on legally required standard for commercial drivers in Nigeria, was found in 11.5% of the participants, while 3.3% of them had monocular blindness with a visual acuity (VA) of less than 3/60 in one eye. Cataract and glaucoma were the major causes of visual impairment.

**Conclusion:** Ensuring that all prospective drivers undergo basic vision tests, followed by prompt referral of those with visual impairment to ophthalmologists could serve as a good case detection outlet. Blinding ocular conditions could be detected early and treated appropriately. This will ultimately prevent unnecessary loss of lives and property.

## INTRODUCTION

Driving can be defined as the ability to operate, control, and direct the course of a vehicle.<sup>1</sup> It is a very important part of everyday life of majority of people. For commercial drivers, it is not just a means of livelihood, but a way of life. Commercial drivers considered to be very important especially in a developing country such as Nigeria, where

majority of the people go on public road transport.

There is little doubt that the visual sense provides most of the information used by the driver, with some contribution from other senses.<sup>2</sup> A driver's vision will largely determine how efficiently he will perform; this may consequently influence the occurrence of road traffic accidents (RTA).

Worldwide, it has been estimated that the number of people killed in RTAs each year is about 1.2 million, while the number of the injured could be as high as 50 million.<sup>3</sup> In many low-income countries, the prevalence of traffic related injuries is such that they represent between 30% and 86% of all trauma admissions.<sup>4</sup> They also constitute a major cause of morbidity and mortality among Nigerians.<sup>5,6</sup>

The diseases of the ocular organ and its adnexa can adversely affect the visual functions of the driver, with serious implications for road safety. The aim of this study therefore is to find out the types and prevalence of ocular and adnexal diseases among commercial intercity vehicle drivers in Ilorin, Nigeria.

## MATERIALS AND METHODS

This cross sectional descriptive study was carried out in Ilorin, the capital city of Kwara State, Nigeria. The study venues were the five major motor parks for CIVDs. Of the estimated 450 drivers, 399 consecutive drivers were included in the study. Written informed consent was obtained from them. This study was cleared by the Ethical and Research Committee of the University of Ilorin Teaching Hospital (UITH), Ilorin. Permission was also sought for and received from the chairmen of the National Union of Road Transport Workers (NURTW) and Road Transport Employers Association of Nigeria (RTEAN) of each motor park.

A structured questionnaire was administered as a face-to-face interview at the motor parks. solicited

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information on the respondent’s biodata, driving history, history of involvement in RTAs, ocular history and general medical history. Four medically qualified assistants were trained in the administration of the questionnaire and how to perform visual acuity (VA) tests. This was done in broad daylight using the Snellen (or the illiterate E) charts placed 6m from the respondents. Each eye was tested separately. The unaided VA, as well as VA with pinhole (when VA is less than 6/6), were assessed and recorded.

One of the authors (BJ) conducted the ocular examinations. Colour vision was tested using the Ishihara pseudo-isochromatic plates. Visual field was tested using the confrontation method. The anterior segment was examined with the aid of a pen torch, and any abnormality discovered was recorded. Fundoscopy was performed with a Welch Allyn direct ophthalmoscope. Intra-ocular pressure (IOP) was measured with the Perkins handheld applanation tonometer, after anaesthetizing and staining the cornea with a mixture of tetracaine-fluoresceine eye drop. The tip was wiped before and after measurements with cotton wool dipped in methylated spirit and allowed to dry. Those found to require further assessment, refraction and surgery were referred to the UIITH. The data collected were analysed using the Statistical Package for Social Sciences (SPSS) 12.0.1 software package, and frequency counts were generated for variables.

### Definition of key terms for the study

**Visual impairment:** Federal Road Safety Corp (FRSC) standard for commercial drivers in Nigeria: at least 6/9 in the better eye and 6/24 in the second eye.<sup>7</sup> Cataract was defined for the purpose of this study as the presence of lens opacity causing a reduction in VA.

**Glaucoma:** presence of a pale, cupped disc with a vertical cup to disc ratio of 0.7 or more.

**Uncorrected refractive error:** improvement in VA (when VA is less than 6/6) with the use of a pinhole.

**Abnormal colour vision:** the inability to correctly identify one or more pseudo-isochromatic plates.

**Abnormal visual field:** the presence of one or more abnormal quadrants on confrontation perimetry.

**Ocular hypertension:** IOP of > 21mmHg in the absence of characteristic glaucomatous optic neuropathy.

### RESULTS

Three hundred and ninety-nine CIVDs participated in the study. These represent 88.7% of the total population of CIVDs in the five parks. All were men. Figure 1 shows the age distribution of respondents.

The mean age was 44.7 years +/- 10.1 as standard deviation. Almost two-thirds of the drivers were between the ages of 41 to 60 years. 264 (66.2%) were above 40 years and 108 (27.1%) were above 50 years.

One hundred and sixty-eight (42.1%) had no form of formal education, while 149 (37.3%) had at least primary education. Two hundred and thirty-seven (59.4%) had been driving for more than 20 years, while 26 (6.5%) had 1-5 year(s) of driving experience.

The ocular symptoms are as shown in table 1. The most frequent complaint was that of poor near vision with 113 (28.3%) drivers having difficulty with small print. Itching, redness of the eye, poor distance vision, foreign body sensation and ocular discharge also ranked high in the ocular symptoms.

**Table 1. Ocular symptoms of respondents**

Ocular Symptoms	n	%
Difficulty with near vision	113	28.3
Itching	90	22.6
Redness	49	12.3
Poor distance vision	46	11.5
Poor night vision	42	10.5
Discharge	34	8.5
Foreign body sensation	30	7.5
Double vision	25	6.3
Photophobia	1	0.3
Floaters	1	0.3

Three hundred and seventy-six (94.2%) of the drivers believed they had adequate vision for driving, while 23 (5.8%) were of the impression that their vision is not good enough for driving. Only 34 (8.5%) drivers were on eye glasses to aid near work, while a smaller number 15 (3.8%) occasionally wear sunglasses.

Table 2 reveals the ocular diagnosis in at least one eye. Presbyopia (28.3%) was the most common ocular morbidity, followed by allergic conjunctivitis (22.6%), pinguecula (18.0%), ocular hypertension (8.8%), pterygium (8.3%), cataract (7.8%), and uncorrected refractive error (6.0%). Colour vision defects (4.3%), and glaucoma (3.8%) also ranked high.

Table 3 reveals the visual acuity of the better and second eye. Most of the drivers (87.0% and 68.2% had VA of 6/6 and above in the better eye and the second eye, respectively. Going by FRSC standards,<sup>7</sup> 27 (6.8%) drivers had visual acuities of less than 6/9 in the better eye, while 32 (18.7%) had visual acuities of less than 6/24 in the bad eye. Overall, 46 drivers (11.5%) had inadequate vision for

holding commercial vehicle license with a VA of less than 6/9 in the better eye and/or less than 6/24 VA in the second eye. Thirteen (3.3%) drivers had monocular blindness, and two of them had just found out for the first time. Majority (77.8%) of those with visual impairment were above 40 years of age.

**Table 2. Ocular findings in 399 drivers**

Ocular findings/diagnosis	n	%
Presbyopia	113	28.3
Allergic conjunctivitis	90	22.6
Pingueculae	72	18
Ocular hypertension	35	8.8
Pterygium	33	8.3
Cataract	31	7.8
Uncorrected refractive error	24	6
Colour vision defects	17	4.3
Glaucoma	15	3.8
Corneal opacity	5	1.3
Age related macular degeneration (ARMD)	3	0.7
Lid scar	2	0.5
Complications from cataract surgery	2	0.5
Optic atrophy	2	0.5
Bacterial conjunctivitis	1	0.3
External hordeolum	1	0.3
Presumed ocular toxoplasmosis (POT)	1	0.3
Asteroid hyalosis	1	0.3

**Table 3. Visual acuity in the better and second eyes**

Visual acuity	Better eye		Second eye	
	n	%	n	%
6/4-6/6	347	87	272	68.2
40061	25	6.3	53	13.3
40152	10	2.5	21	5.3
6/18	6	1.5	17	4.3
6/24	7	1.7	4	1
6/36	4	1	12	3
6/60	0	0	5	1.2
5/60-3/60	0	0	10	2.5
2/60-light perception (LP)	0	0	10	2.5
No light perception(NPL)	0	0	3	0.7
TOTAL	399	100	399	100.0

Uncorrected refractive error and cataract were the usual causes of inadequate VA in the better eye, while glaucoma and cataract were more predominant in the second eye of the 399 drivers examined (see table 4).

**Table 4. Causes of inadequate VA in the better and second eyes of the 399 respondents**

Aetiology	Better eye		Second eye	
	n	%	n	%
Uncorrected refractive error	10	2.3	4	1
Cataract	10	2.5	5	1.3
Glaucoma	1	0.3	8	2
Pterygium	4	1	1	0.3
Optic atrophy	0	0	2	0.5
Complications from cataract surgery	0	0	2	0.5
ARMD	2	0.5	2	0.5
Presumed ocular toxoplasmosis	0	0	1	0.3
Corneal opacity	0	0	2	0.5

Visual field defects were seen in four (1.0%) and 22 (5.5%) drivers' better and second eyes respectively. The causes of visual field defects in the better eyes were cataract (4), and advanced glaucoma (1).

Intraocular pressure measurements were performed in 377 (94.5%) drivers. These could not be done in 22 drivers because, among them, 21 declined and 1 had bacterial conjunctivitis. Minimum and maximum IOPs in the better and second eyes were 6 and 40 mmHg and 6 and 52 mmHg, respectively. The mean IOP was 16.4 mmHg +/- 4.5 as standard deviation in the better eyes and 16.6 mmHg +/- 5.2 as standard deviation in the second eyes.

## DISCUSSION

About two-thirds (66.2%) of the drivers studied were over 40 years, and over one-fifth were above 50 years. Older drivers were found to be worse than younger ones in tests of visual function, as well as in accident rates.<sup>8</sup> This may be due to an age-related increase in the prevalence of ocular diseases capable of causing visual impairment and blindness among the older generation. More than 82% of all the people who are blind are 50 years or older though this age cohort represents only 19% of the world's population.<sup>9</sup> On the contrary, some other researchers have found that age and visual health are not strongly related to driving performance and accident rates.<sup>10, 11</sup> This may be due to the fact that older drivers, especially those with

impaired vision tend to limit their driving in order to avoid mishaps. Some may even stop driving of their own accord or when counselled.

The high percentage of drivers (42.1%) with no formal education in this study may have a detrimental implication as far as road safety is concerned, as this may affect their ability to read and interpret road signs. There is still a pressing need to increase the literacy level of the general populace, including drivers.

Ocular examinations before issuance of driving license are not routinely done. This was revealed by the small percentage of drivers that had VA assessments at first licensing and at least once during renewal. Two of the drivers even admitted to driving without the necessary license. This is in agreement with the findings of other researchers in Nigeria.<sup>12, 13, 14</sup>

## Ocular Symptoms

Symptoms of ocular disease among the CIVDs examined were varied. Difficulty with near work accounted for the majority of the eye complaints. It is one of the symptoms of presbyopia; a condition of gradual decline in the accommodative power of the eye. The difference between the total number of drivers above 40 years of age (264) and those with difficulty with near work (113) may be related to the literacy level, which is quite low in this study and individual's personal near vision needs, as well as the ability to cope with such needs. The prevalence of presbyopia in this study (28.3%) is high when compared with 4.3% and 12.5% found by Falola<sup>15</sup> and Okafor.<sup>14</sup> The high number of older drivers in this study may also explain this. However, only about one-third of the patients with difficulty with near work wore corrective eyeglasses.

## Ocular Findings

After presbyopia, allergic conjunctivitis was the most common ocular diagnosis in the drivers. It is characterized by ocular itching, redness, lacrimation, discharge and the presence of tarsal papillae. Plant pollens, dust, and smoke are potential allergens that these drivers are likely to come into contact with on a daily basis. Pterygium (8.3%) and inflamed pingueculae (18.0%) were also predominant findings. These two conditions are conjunctive degenerations whose pathogeneses have been linked with exposure to dry and windy conditions, as well as to ultraviolet (UV) and infrared radiation from sunlight.<sup>16, 17</sup>

These risk factors characterize the typical outdoor working conditions of a driver, more so as the majority (96.2%) of the drivers were not in the habit of wearing protective eyeglasses.

Cataract and glaucoma were found in 7.8% and 3.8% of the drivers. These are very important causes of

blindness and visual impairment worldwide.<sup>9</sup> One of the factors of the pathogenesis of cataract is excessive exposure to UV radiation. It is noteworthy that a large percentage of these drivers do not wear or believe in wearing ocular protective glasses, the majority of which would absorb most of the UV radiations that are harmful to the eye. Apart from a reduction in VA, cataract is also a potent cause of glare, reduced contrast sensitivity, and impairment of visual fields. These are all important parameters that significantly affect the performance of a driver.

Glaucoma is the second leading cause of blindness after cataract in the developing countries.<sup>13</sup> The primary open angle type is the most prevalent among blacks. Untreated, it causes a painless and irreversible loss of vision. Peripheral visual fields are affected early while the central fields may still be preserved. Early detection with prompt and effective treatment is the key to curtailing this glaucoma. Falola<sup>15</sup> found a rather high prevalence of 9.7%, while Nwosu et al.<sup>18</sup> reported 0.56%.

Ocular diseases leading to deterioration of vision were refractive error, cataract and glaucoma. This has implication for the safety of passengers boarding these vehicles, and may lead to the unnecessary loss of life and property. Ensuring that basic vision tests are done in conjunction with adequate referral of drivers, could be a major case detection outlet for these ocular diseases, especially glaucoma, in which early detection and adequate treatment are paramount.

## CONCLUSION

The common ocular morbidities seen were presbyopia, allergic conjunctivitis, pingueculae, ocular hypertension, pterygium, cataract and uncorrected refractive error. Cataract and glaucoma were the potentially blinding ocular diseases seen. This highlights the need for renewed efforts to educate vulnerable groups on these preventable causes of blindness and visual impairment, by ensuring that every potential driver at first licensing and at renewals gets the basic vision test done. Those found to have visual impairment should be referred to ophthalmologists for detailed ocular evaluation.

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