

# Ocular Status of Commercial Drivers in a Nigerian Community

C.O. Omolase<sup>1\*</sup>, O.T. Afolabi<sup>2</sup>, B.O. Omolase<sup>3</sup> and C.O. Ihemedu<sup>1</sup>

<sup>1</sup>Department of Ophthalmology, Federal Medical Centre, Owo, Ondo State, Nigeria

<sup>2</sup>Department of Community Medicine, Obafemi Awolowo University Teaching Hospital Complex, Ile-Ife, Osun State, Nigeria

<sup>3</sup>Department of Medicine, Federal Medical Centre, Owo, Ondo State

## Abstract

**Aim:** This study aimed at determining the ocular status of commercial intercity drivers.

**Methods:** This descriptive study was conducted at Owo, South West Nigeria among commercial intercity drivers between June and September, 2009. Ethical clearance was obtained from the Ethical Review Committee of Federal Medical Centre, Owo, Ondo State, Nigeria prior to commencement of this study. Informed consent was obtained from each of the respondents.

Chi-square test was done to determine if there was a statistically significant difference between the study parameters.

**Results:** Ninety respondents were enrolled in this study. The driving experience of the respondents revealed that most respondents (58.9%) had more than 20 years driving experience. Few respondents (2.2%) had visual impairment in the better eye. None of the respondents had colour vision defect. Most respondents: 66(73.3%) did not have eye test at the time they obtained drivers' licence. Majority of the respondents: 54(60%) did not have ocular morbidity. The visual acuity in the better eye and second eye was not significantly associated with involvement in Road Traffic Accident with a p value of 1.2 and 0.14 respectively.

**Conclusion:** Few respondents had ocular morbidity and the prevalence of visual impairment in the better eye was very low. Most respondents did not have ocular examination at the time they were issued drivers' licence thus it should be introduced as part of the compulsory test process for issuing and renewing drivers license in Nigeria.

**Keywords:** Commercial drivers; Ocular status; Road traffic accident; Nigeria

## Introduction

Driving is the primary mode of travel in many countries [1]. It facilitates the performance of routine daily activities and it is thus integrated with the concept of quality of life [2]. In Africa, driving a car is still considered a privilege, an enviable option not a risky task with inherent responsibilities [3]. In Nigeria commercial vehicles are operated as business ventures. However, concern had been expressed about the poor conditions of some vehicles plying Nigerian roads most especially commercial vehicles.

Road traffic accident is a major health problem worldwide [4]. It is a leading cause of death from trauma [5-8]. Each year an estimated 1.2 million people are killed in road traffic crashes and up to 50 million injured worldwide [9]. It has been predicted that by 2020, road traffic injuries will rank as high as third among causes of disability-adjusted life years (DALYs) lost [10]. The annual cost of road crashes is in excess of 500 billion dollars and in the developing world the estimated cost is about 65 billion dollars each year [11]. The developing countries account for more than 85% of all road traffic accidents in the world [12-14]. In Africa, pedestrians and passengers of public transportation are the most affected in road traffic accidents [15]. Vision is a fundamental component of safe driving [1]. Driving is a visually intensive task [16] which requires several sets of abilities which include sensory ability (mainly visual), mental ability, motor ability and compensatory abilities [17]. One needs different kinds of vision to be able to drive safely [18]. Any significant loss of visual function such as visual acuity or visual field will diminish a person's ability to operate a motor vehicle safely on today's congested high-speed road ways. If the distance vision is poor the driver may not see the hazards until it is too late to react safely. Distance vision can be affected by the state of the windscreen thus, this should be kept clean and free of dust and scratches which can reduce vision greatly especially at night. The ability for accommodation (near vision focusing) is needed to see the dash board of vehicles. The

peripheral visual field is needed to make the best use of side and rear mirrors and keep them adjusted correctly. The depth of perception is needed to be able to judge distance well, overtake other vehicles and change lane especially in a busy traffic. A driver with marked visual defect may fail to react appropriately due to inability to perceive a potentially dangerous situation. Automobile accidents sometimes occur because of the driver's inability to judge distances accurately. However, judging distance is a skill that can be learned even by people with monocular vision. Colour vision is important in the recognition of traffic signs and signals, various vehicle lamps and signals. Drivers should be able to recognize and respond to these stimuli in the driving environment. The ability to adapt to decreased illumination and to recover rapidly from exposure to glaring headlights is of great importance for night driving. People with reduced contrast sensitivity may experience difficulty in driving in spite of having adequate visual acuity to drive. Loss of contrast sensitivity can be associated with increased age, cataract, refractive surgery as well as other ocular disorders.

The mounting toll of road traffic accident deaths in Nigeria constitutes a public health problem which requires urgent attention since these deaths are preventable [19]. The minimum visual acuity requirement for driving in Nigeria as set by Federal Road Safety Commission (FRSC), to be tested at a distance of 6m is 6/9 in the better eye and 6/24 in the second eye for commercial drivers [20]. In view of

\*Corresponding author: Dr. Charles Oluwole Omolase, Department of Ophthalmology, Federal Medical Centre, Owo, Ondo State, Nigeria, Tel. +234-08033788860; E-mail: omolash2000@yahoo.com

Received March 12, 2012; Accepted April 09, 2012; Published April 11, 2012

**Citation:** Omolase CO, Afolabi OT, Omolase BO, Ihemedu CO (2012) Ocular Status of Commercial Drivers in a Nigerian Community. J Community Med Health Educ 2:138. doi:10.4172/2161-0711.1000138

**Copyright:** © 2012 Omolase CO, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

the importance of good vision in safe driving this study was conducted to assess the ocular status of inter-city commercial drivers in Owo, South-West Nigeria.

## Methods

This descriptive cross-sectional study was conducted over three months between June and September, 2009. Ethical clearance was obtained from the Ethical Review Committee of Federal Medical Centre, Owo, Ondo State, Nigeria prior to commencement of this study. The permission of the leadership of Road Transport Workers' Union in the community was sought and obtained before data collection. Ninety intercity commercial drivers out of the estimated one hundred and sixty intercity commercial drivers in the community were enrolled in this study. Informed consent was obtained from all the respondents. They were interviewed with the aid of semi-structured questionnaire by the authors and two research assistants. The research assistants were trained in administration of semi-structured questionnaire and assessment of visual acuity. The respondents were interviewed by the authors and research assistants at the secretariat of Road Transport Workers Union and at six different parks in the community. Data elicited from the respondents with the aid of the study instrument (semi-structured questionnaire) included their bio-data, duration of driving, history of ocular problem and use of recommended glasses. All the respondents had their eyes examined. Their visual acuities and colour vision were assessed with the aid of Snellen's chart and Ishihara pseudochromatic plates respectively. Visual acuity was assessed with the aid of the Snellen's chart placed 6m from the respondents in broad day light at the study venues. The respondents had their eye examined with the aid of pen torch and direct ophthalmoscope. All respondents who had ocular problems were referred to the eye clinic at Federal Medical Centre, Owo for further evaluation and management. The data obtained was collated and analyzed with the aid of Statistical Package for Social Sciences (SPSS) 15.0.1 statistical software. Cross tabulation of visual acuity with involvement with road traffic accident was done with chi-square test and statistical significance was set at  $p \leq 0.05$ .

## Results

Ninety respondents participated in this study. Their ages ranged between 22 and 70 years with a mean age of 45.2 years  $\pm 10.7$  years. The respondents were all males. The majority of the respondents were married (95.6%), 3.3% were single and the remaining 1.1% was divorced. Most respondents were Yorubas (96.7%) and the remaining 3.3% were of other ethnic groups. Half of the respondents (50%) had secondary education, 34.4% had primary education, 12.2% had no formal education while the remaining 3.3% had tertiary education. The respondents were predominantly Christians (75.6%) while 24.4% were Muslims. The duration of driving experience of the respondents revealed that majority of the respondents (58.9%) had more than 20 years driving experience (Table1).

Most respondents (82.2%) had driver's licence while the licence of the remaining 17.8% had expired at the time of this study.

Use of recommended glasses: Few respondents (8.9%) used recommended glasses while majority (91.1%) did not use recommended glasses.

Most respondents (97.8% and 91.1%) had visual acuity of 6/5-6/18 in the better eye and second eye respectively (Table 2). The visual acuities in the better and second eye are as detailed in table 2.

Most respondents with eye problem (54.1%) did not seek eye treatment, 21.6% sought orthodox treatment while 24.3% practised self

medication. All the respondents had normal colour vision. Most of the respondents (60%) did not have ocular morbidity while the remaining 40% had ocular morbidity. The ocular findings of the respondents revealed that 36.1% had presbyopia and 33.3% had immature cataract (Table 3).

Involvement in Road Traffic Accident: Few respondents: 18(20%) had history of involvement in RTA while driving and the remaining 72 (80%) had not been involved in RTA.

The visual acuity in the better and second eye did not significantly affect involvement in road traffic accident with a p value of 1.2 and 0.14 respectively (Table 4).

## Discussion

All our respondents were males and this finding is expected in view of the fact that the commercial inter-city driving is an exclusive preserve of males in Nigeria. The mean age of 45 years is in tandem with an active work force that the respondents belong to as commercial driving is a demanding occupation. The importance of relatively young age in safe driving cannot be overemphasized. With increasing age there is a decline in sensory cognitive function. It has been reported that older drivers have more accidents per mile than their younger counterparts [21]. Furthermore if an older driver is involved in road traffic accident, it is more likely to be fatal [22]. After the age of 50 years, there is rapid decline in sensory vision resulting in reduction in visual

| Duration(Years) | Frequency | Percentage (%) |
|-----------------|-----------|----------------|
| <5years         | 7         | 7.8            |
| 5-10 years      | 9         | 10             |
| 11-15 years     | 18        | 20             |
| 16-20 years     | 3         | 3.3            |
| >20 years       | 53        | 58.9           |
| <b>Total</b>    | <b>90</b> | <b>100</b>     |

Table 1: Duration of driving experience.

| Visual acuity | Better eye |               | Second eye |               |
|---------------|------------|---------------|------------|---------------|
|               | Frequency  | Percentage(%) | Frequency  | Percentage(%) |
| 6/5-6/18      | 88         | 97.8          | 82         | 91.1          |
| 6/18-6/60     | 2          | 2.2           | 8          | 8.9           |
| <b>Total</b>  | <b>90</b>  | <b>100</b>    | <b>90</b>  | <b>100</b>    |

Table 2: Visual acuity of better and second eyes.

| Ocular findings         | Frequency | Percentage(%) |
|-------------------------|-----------|---------------|
| Presbyopia              | 13        | 36.1          |
| Immature cataract       | 12        | 33.3          |
| Glaucoma                | 4         | 4.4           |
| Allergic conjunctivitis | 3         | 3.3           |
| <b>Total</b>            | <b>36</b> | <b>100</b>    |

Table 3: Ocular findings of respondents.

| Involvement in RTA | Visual acuity in better eye |           | Total     |
|--------------------|-----------------------------|-----------|-----------|
|                    | 6/5-6/18                    | 6/18-6/60 |           |
| Yes                | 17                          | 1         | 18        |
| No                 | 71                          | 1         | 72        |
| <b>Total</b>       | <b>88</b>                   | <b>2</b>  | <b>90</b> |
| Involvement in RTA | Visual acuity in second eye |           | Total     |
|                    | 6/5-6/18                    | 6/18-6/60 |           |
| Yes                | 16                          | 2         | 18        |
| No                 | 66                          | 6         | 72        |
| <b>Total</b>       | <b>82</b>                   | <b>8</b>  | <b>90</b> |

Table 4: Cross tabulation of visual acuity and involvement in RTA.

acuity, contrast sensitivity, stereo acuity and visual field sensitivity [23]. Good understanding of how functional changes with age affect driving ability is likely to improve road safety [24].

Vision is the most important source of information during driving and driving related injuries have been associated with visual problems. Therefore, visual assessment of drivers is a major health issue. The prevalence of visual impairment in this study in the better eye was 2.2% and this finding is close to another Nigerian study by Oladehinde et al. which reported prevalence of visual impairment in the better eye of 3.3% [17]. A study carried out by Adekoya et al. among commercial drivers in Ilorin, Nigeria reported a prevalence of visual impairment of 2.8% in the better eye [25]. However, McMoli et al. that utilized definition of subnormal vision as 6/9 or less reported a prevalence of 9.1% among some Nigerian drivers [26]. The definition of subnormal vision in the latter study may have accounted for the relatively high prevalence rate reported. These former and latter studies just like our own study utilized presenting visual acuity as opposed to corrected visual acuity which could possibly have reduced the prevalence of visual impairment. We opted to use the presenting visual acuity in this study as this is the drivers' habitual visual acuity for driving most of the time. It is quite interesting that none of our respondents had monocular blindness. This finding is a pointer to the fact that the drivers enjoyed relatively good eye health. It has been reported by some other Nigerian researchers that some drivers operate on Nigerian roads with vision less than the legal requirement for safe driving [27,28]. It is therefore worrisome that most of our respondents did not have visual acuity assessment as recommended by Federal Road Safety Commission of Nigeria [20]. There was no significant association between involvement in RTA and visual impairment in this study (p value = 1.2 and 0.14 respectively). This finding is at variance with the findings of other Nigerian studies by Oladehinde et al., Effiong et al. and Nwosu et al. [17,26,27]. It is remarkable to note that none of our respondents had colour vision abnormality. However, a limitation of this study is the use of Ishara pseudoisochromatic plate for colour vision assessment which could only detect congenital colour defect as other tests such as Fanswort Munsell 100 Hue test which could detect acquired colour vision defect were not available at the time of this study. However, defective colour vision is actually not a barrier to driving private and commercial vehicles in most countries [28]. Colour vision defect may constitute hazard to safe driving as drivers with colour vision defect may have difficulty in identifying road signs and recognizing traffic lights. A direct link between increased risk of road traffic accident and colour vision defect has not been established [25]. Refractive error was present in most of our respondents with ocular morbidity and this brings to fore the need for improvement in optical services to take care of people in need. Immature cataract was the second leading cause of ocular morbidity in this study and this is expected as cataract is the commonest cause of visual impairment and blindness worldwide. Cataract reduces visual acuity, contrast sensitivity and also causes an increase in disability glare [29,30] and self-reported difficulties with the tasks of daily driving [31]. Removal of cataract is associated with a marked improvement in both health related quality of life and driving performance [32,33].

## Conclusion

Few respondents had ocular morbidity. The prevalence of visual impairment in the better eye was very low. This finding would go a long way in ensuring that most of them would meet the minimum visual requirement for driving. Majority of the respondents did not have ocular examination at the time they were issued drivers' licence.

## Recommendation

- i. Ocular examination should be introduced as part of the compulsory test process for issuing and renewing drivers license in Nigeria. This measure would ensure compliance with the minimum visual requirement for driving in Nigeria.
- ii. In view of the fact that only few of the respondents used recommended glasses, there is need to make optical services readily accessible to commercial drivers so that they can easily obtain recommended glasses whenever the need arises .

## Acknowledgement

We glorify God for a successful completion of this work. The support of the Management of Federal Medical Centre, Owo is hereby acknowledged. We are also grateful to the respondents for graciously accepting to participate in this study. The cooperation of Road Transport Workers, Owo branch is appreciated.

## References

1. Bener A, Ahmad MD MF, El-Tawil MS, Al-Bakr S (2004) Visual impairment and motor vehicle accidents. *The Middle East Journal of Emergency Medicine* 4: 1-9.
2. Owsley C, McGwin G Jr (1999) Vision impairment and driving. *Surv Ophthalmol* 43: 535-550.
3. Lagarde E (2007) Road traffic injury is an escalating burden in Africa and deserves proportionate research efforts. *Plos Med* 4: e170.
4. Museru LM, Macharo CN, Leshabari MT (2002) Road traffic accidents in Tanzania: A ten year epidemiological appraisal. *East and Central African Journal of Surgery* 7: 23-26.
5. Solagberu BA, Adekanye AO, Ofoegbu CP, Udoffa US, Abdul-Rahman LO, et al. (2003) Epidemiology of trauma deaths. *West Afr J Med* 22: 177-181.
6. Ekere AU, Yellowe BF, Umune S (2004) Surgical mortality in emergency room. *Int Orthop* 28: 187-190.
7. Balogun JA, Abereoje OK (1992) Pattern of road traffic accident cases in a Nigerian university teaching hospital between 1987 and 1990. *J Trop Med Hyg* 95: 23-29.
8. Adesunkanmi AR, Akinkuolie AA, Badru OS (2002) A five year analysis of death in accident and emergency room of a semi-urban hospital. *West Afr J Med* 21: 99-104.
9. Krug EG, Sharma GK, Lozano R (2000) The global burden of injuries. *Am J Public Health* 90: 523-526.
10. Ad Hoc Committee on Health Research Relating to future intervention options (1996) Investing in health research and development. Geneva: World Health Organization.
11. Jacobs G, Aeron-Thomas A (2000) Africa Road Safety Review: Final report.
12. Nantulya VM, Reich MR (2002) The neglected epidemic: road traffic injuries in developing countries. *BMJ* 324: 1139-1141.
13. Ameratunga S, Hajar M, Norton R (2006) Road –traffic injuries: confronting disparities to address a global health problem. *Lancet* 367: 1533-1540.
14. Mohan D (2002) Road safety in less-motorized environments: future concerns. *Int J Epidemiol* 31: 527-532.
15. Odero W, Garner P, Zwi A (1997) Road traffic injuries in developing countries: A comprehensive review of epidemiological studies. *Trop Med Int Health* 2: 445-460.
16. Kotecha A, Spratt A, Viswanathan A (2008) Visual function and fitness to drive. *Br Med Bull* 87:163-174.
17. Oladehinde MK, Adeoye AO, Adegbehingbe BO, Onakoya OA (2007) Visual functions of commercial drivers in relation to road accidents in Nigeria. *Indian J Occup Environ Med* 11:71-75.
18. Vision and driving (fact sheet 25) (2009) NZ Transport Agency.
19. Eke N, Etebu EN, Nwosu SO (2000) Road traffic accident mortalities in Port Hacourt, Nigeria. Anil Aggrawal's Internet Journal of Forensic Medicine and Toxicology 1.
20. Agunloye O (1990) Guidelines for the National Drivers Licence Scheme. Public Education Department Headquarters, Lagos, Nigeria: Federal Road Safety Commission: 6-9.

21. Freeman EE, Munoz B, Turano KA, West SK (2006) Measures of visual function and their association with driving modification in older adults. *Invest Ophthalmol Vis Sci* 47: 514-520.
22. Older drivers: a literature review (Road Safety Research Report No.25) (2009) Department for Transport, Local Government and the Regions.
23. Johnson MA, Choy D (1987) On the definition of age-related norms for visual functioning testing. *Appl Opt* 26: 1449-1454.
24. Adekoya BJ, Owoeye JF, Adepoju FG, Ajaiyeoba AI (2009) Visual function of commercial intercity vehicle drivers in Ilorin, Nigeria. *Can J Ophthalmol* 44: 261-264.
25. McMoli TE, Ogunmekan IO (1983) Road traffic accidents in Nigeria—observation on controllable human factors in Lagos. *Afr Ann Med* 1: 30-33.
26. Effiong B (1993) Visual status of Taxi Drivers in Enugu. Dissertation submitted to National Post Graduate Medical College of Nigeria.
27. Nwosu SN, Osuntokun O, Ajayi BGK (1991) The prevalence of subnormal vision among government vehicle drivers in Oyo State, Nigeria. *Niger Med J* 2: 51-53.
28. Casson EJ, Racette L (2000) Vision standards for driving in Canada and the United States. A review for the Canadian Ophthalmological Society. *Can J Ophthalmol* 35: 192-203.
29. Adamsons I, Rubin GS, Vitale S, Taylor HR, Stark WJ (1992) The effect of early cataracts on glare and contrast sensitivity . A pilot study. *Arch Ophthalmol* 110: 1081-1086.
30. Rubin GS, Adamsons IA, Stark WJ (1993) Comparison of acuity, contrast sensitivity and disability glare before and after cataract surgery. *Arch Ophthalmol* 111: 56-61.
31. Mangione CM, Phillips RS, Lawrence MG, Seddon JM, Orav EJ, et al. (1994) Improved visual function and attenuation of declines in health-related quality of life after cataract extraction. *Arch Ophthalmol* 112: 1419-1425.
32. Owsley C, McGwin G Jr, Sloane M, Wells J, Stalvey BT et al. (2002) Impact of cataract surgery on motor vehicle crash involvement by older adults. *JAMA* 288: 841-849.
33. Wood JM, Carberry TP (2006) Bilateral cataract surgery and driving performance. *Br J Ophthalmol* 90: 1277-1280.