Eye Diseases Among Drivers In The University College Hospital and College of Medicine, University of Ibadan, Nigeria.

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Abstract

Objective of this study is to determine the pattern of eye diseases amongst drivers of College of Medicine, University of Ibadan (UI) and the University College Hospital (UCH), Ibadan.

Cross sectional study of (99) drivers employed by the two institutions using a semi structured questionnaire and thorough eye examination at the eye clinic of UCH. Our results show that age range of respondents was from 39-60 years, mean 50.1+/- 4.78 years. Driving experience ranged from 5 to 43 years, mean 27.9years +/- 6.24. Causes of ocular morbidity were pterygium 14.1%, pingueculum 8 %, optic atrophy 8%, glaucoma 4%, and pathological myopia 1%. Risk of developing anterior segment disease increased with number of years spent driving. (OR 2.4, 95% CI 1.1-6.2; P=0.05).

We conclude that periodic eye examination of drivers can help to identify potential blinding eye diseases such as glaucoma and cataract and allow prompt treatment to prevent blindness and ensure safe driving. Drivers may be redeployed to an administrative job after a prolonged period of driving and when visual impairment ensures.

Key words: Driver, cross sectional survey, pterygium, pingueculum, occupational eye disease

Introduction:

A driver guides a motorized vehicle through paths while at the same time avoiding collision with potential obstacles. Thus a basic requirement for effective performance of the Driver is a good ocular health. A survey by Nwosu[1] to determine the prevalence and pattern of subnormal vision and the relationship between subnormal vision and road traffic accidents among civil servant motor vehicle drivers in Oyo state, Nigeria, revealed a prevalence of subnormal vision of 3.1%, monocular blindness 2.4%, colour vision defect 3.3%, and refractive errors 20.2%. A statistically significant association was found between road traffic accident and subnormal vision. Mass visual field screening of a driving population in California in the United States of America revealed that approximately 5% of the eyes tested demonstrated significant visual field loss. The study showed that mass visual field screening of persons who drive is feasible and valuable technique for early detection of eye disease in large populations[2].

Driving (especially in tropical environments) entails exposure to sunlight, which has been shown to increase the occurrence of ocular pathology[3]. A study to investigate the effect of environmental hazards on conjunctival disorders in postmen, by Tang et al[4] compared the prevalence of pterygium and pingueculum between 248 postmen and 146 office workers in 11 post offices in central Taiwan. The prevalence of pinguecula and pterygium were 62.9% and 7.3%, respectively among the postmen and office workers. The outdoor nature of postal work was found to be significantly associated with the occurrence of pinguecula as well as pterygium. Conjunctival disorders were found to be associated with the cumulative occupational sunlight exposure of postmen working outdoors.

The policy in most Government establishments is to carry out pre-employment examination of new employees routinely including eye examinations for drivers. This screening exercise provides opportunity to identify drivers with eye problems who are subsequently treated or excluded from employment if found incapable of the job because of eye disease.

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After the pre-employment examination however, periodic eye examinations are usually not done except when an individual develops eye problems. A recent screening test on health workers for glaucoma in the University College Hospital (UCH), Ibadan found a prevalence of 2.7 %[5]. The study however focused on glaucoma only and did not target drivers as a special risk group for other possible diseases hence the need for this study which was embarked upon with the aim of determining the prevalence of eye diseases amongst drivers of the College of Medicine, University of Ibadan and the UCH. Findings would assist in making suggestions to improve eye health of drivers in the institutions.

Materials and Methods

The study was carried out at the Eye Clinic, of the University College Hospital, Ibadan over a period of two months, December 2003 and January 2004. Subjects for the study were motor vehicle drivers, who were employees of the College of Medicine UI (67), and the UCH (35), all 102 drivers were invited. However only 99 out of 102 who were eligible were recruited and examined. All College of Medicine drivers participated but only 32 out of 35 drivers from UCH consented and participated in the study the remaining 3 in out stations did not show up for their assessment during the period of the study despite repeated reminder.

Ethical approval was obtained from the UI/UCH joint institutional review committee before the commencement of the study. Subjects had a signed informed consent collected and were interviewed using a standard semi-structured self administered questionnaire on socio-demographic characteristics including age (names were excluded to ensure confidentiality), marital status, religion and level of education, number of years spent actively driving since the commencement of occupation of driving, current and previous eye complaints or diseases.

Eye examination was carried out by just the principal investigator to eliminate inter observer error. These included a measurement of visual acuity using a Snellen's chart at 6 meters, examination of the eyes with torchlight, then a direct ophthalmoscope, slit lamp, and applanation tonometer. Applanation tonometry was carried out after instilling topically, 2% tetracaine anaesthetic eye drops into the inferior conjunctiva. A single measurement of intraocular pressure using a Goldman tonometer was done and recorded. Gonioscopy with a three-mirror gonioscopy lens was done only for subjects with elevated intraocular pressure and optic disc cupping suggestive of glaucoma. Objective refraction was done using a Keeler streak retinoscope at a distance of 66cm followed by subjective refraction for distance and near to determine the presence of underlying refractive error and presbyopia. Colour vision was tested with the aid of an Ishihara colour vision chart. Peripheral and central perimetry was finally done using a Lister manual perimetry machine to identify the presence of field defects in the subjects.

The data generated was coded, entered into a personal computer and analysed using Statistical Package for Social Sciences (SPSS for Windows 10.0 1999). Frequency tables and proportions were used for data summarization and presentation of qualitative data. Means and standard deviations were used for quantitative data, Odds ratios together with the 95% confidence interval were calculated as estimates of relative risk of suspected variables while level of significance was determined using Fishers exact test and with its associated P-value. P value less than 0.05 was considered significant.

Results

Ninety-nine motor vehicle drivers were recruited into the study out of which 67 (67.7%) were from the College of Medicine, while 32 (32.3%) came from the UCH. They were all males, with age range of 38 to 60 years, mean 50.10 $\pm$ 4.78 years. Driving experience ranged from 5 years to 43 years, mean 27.94 years $\pm$ 6.24. Most (97%) of the drivers were married, only 3% were yet to be married. Majority (60.6%) of the drivers were Christians while 39.4% were Moslems. Majority of the drivers (92.8%) had primary school education and could read and write, 16 (16.2%) had secondary school education while only 1(1.0%) had post-secondary education Table 1 summarises the socio-demographic characteristics of the drivers.

The common causes of ocular morbidity amongst the studied drivers were pterygium 14(14.1%), pingueculum 8(8.0%), optic atrophy

Table 1: Socio-Demographic characteristics of drivers

Characteristic	Number	percent
Employer		
College of Medicine	67	67.7
UCH	32	32.3
Marital status		
Married	96	97.0
Unmarried	3	3.0
Religion		
Christians	60	60.6
Moslems	39	39.4
Education attained		
Primary/Basic	82	82.9
Secondary	16	16.2
Post-secondary	1	1.0

Table2 : Distribution of eye diseases among drivers

Anterior segment eye disease	Number	percent
anterior segment		
Pterygium	14	14.1
Pingueculum	8	8.1
Cataract	5	5.1
Episcleritis	1	1.0
Exotropia	1	1.0
Nil	70	70.7
Total	99	100
Posterior segment		
Optic atrophy	8	8.1
Glaucoma	4	4.1
Colour defects	3	3.0
Pathological myopia	1	1.0
Nil	83	83.8
Total	99	100

By cumulative number of years driving

	cataract	pterygium	pingueculum	glaucoma	Optic atrophy
<20yrs	0	0	0	0	0
20-24yrs	2	2	0	2	1
25-29yrs	2	5	2	1	3
30-34yrs	0	4	5	1	3
>35yrs	1	3	1	0	1

Table 3: Risk of anterior segment eye disease among drivers

Condition of driver	Odds ratio	95% CI	P-value
Christian vs Moslem driver	0.560.	3-1.0	0.07
Driving for >25 years	2.4	1.1-6.2	0.05
Driver aged >50yrs	1.2	0.9-1.5	0.25

8(8.0%), cataract 5 (5.0%), glaucoma 4 (4.0%) and defective colour vision 3(3.0%). Only three left eyes had glaucomatous field defects, while 6 subjects with optic atrophy had none specific peripheral and central field defects. No driver had optically un-correctable bilateral visual impairment or blindness but 1(1.0%), had a blind left eye from cataract, 1(1.0%) was visually impaired from cataract and 1(1.0%) was visually impaired from cataract with optic atrophy. Details of the causes of ocular morbidity as well as the distribution amongst the drivers are as shown Table 2.

Anterior segment diseases were less common among Christians (21.7%) than their Moslem counterpart drivers, (38.5%) although the risk was not statistically significant (OR 0.56, 95% CI .30-1.1, P=0.07). About two-third (68.3%) of Christians drove for over 25years compared to 76.9% of Moslems. Moslem drivers were also more likely to report having part time jobs (76.9%) than their Christian counterparts (61.7%). Examination of the risk of developing eye disease with increasing number of years spent driving among all the drivers showed that, although both anterior and posterior segment diseases were more common in those who had spent greater number of years driving. The risk for anterior segment disease appeared greater. Thus, 33.8% of the group of drivers who had spent over 25years driving compared to 14.3% of those who had spent less than 25 years driving had anterior segment disease (OR 2.4, 95% CI 1.1-6.2; P=0.05). On the other hand, 16.9% of drivers who had spent over 25 years compared to 10.7% of those in the group who spent less than 25 years developed posterior segment eye disease (OR 1.6, 95 % CI 0.5-5). Examination of the risk of anterior segment disease between drivers less than 50years of age versus those over 50 years of age showed an increasing but not statistically significant risk of anterior segment disease with increasing age (25% less than 50 years old have anterior segment disease compared to 34% over 50 years of age, OR 1.2, P=0.25).

Further examination of the drivers aged less than 50 years showed that 11(36.6%) of those with more than 25 years driving experience compared with 2(8.0%) with less than 25years driving experience had anterior segment disease (OR 4.6, 95% CI 1.2-18.8, P=0.07 Table 3 summarises the risk of anterior segment disease among studied drivers. The small numbers involved did not allow for sub group statistical analysis by 5yearly intervals.

Discussion

A good number of eye diseases were identified with the drivers although not in sufficiently advanced stages to cause visual impairment in most cases. Pterygium, pingueculum and cataract were the most common anterior segment

disease seen in 14.0%, 8.0% and 5.1% respectively. This is not surprising since drivers may be exposed to both prolonged effect of ultraviolet radiation and wind while driving for long hours. These factors have been reported to be causative for the development of pterygium and other anterior segment diseases amongst out door workers.[3,4,6]

This study showed an association between number of years spent driving and development of anterior segment eye disease especially among younger drivers. This may be related to a more exuberant fibroblast proliferation following UVR damage to subconjuctival tissue in the young[7]. Prevalence of anterior segment disease was also reported to be high (16.6%) in a survey on Nigerian Navy personnel in Lagos.[8] Navy personnel spend long hours sailing outdoors under the effect of wind and sunlight.

Ultraviolet radiation, is invisible electromagnetic radiation of the same nature as visible light, but having shorter wavelengths and higher energies. The eye like the skin can suffer acute and chronic effects from the absorption of UVR. Chronic injuries, occur chiefly due to long-term exposure to scattered and reflected solar UV radiation in the environment, they include ptergium, pingueculae and "Labrador Keratopathy," also known as "Climatic Droplet Keratopathy" (CDK)[9]. No case of CDK was seen among the drivers studied. Epidemiological studies have also shown that cumulative solar UVR exposure is an important causative factor for cortical cataract[10].

The study also observed that there was a greater risk of developing anterior segment disease amongst Moslem drivers who tended to report having part time jobs and driving for longer periods than their Christian counterparts. A previous report had found that over 31% of the drivers population were involved in part time jobs[11]. The religious practice of breaking a long journey to carry out prayer sessions facing the East, which may be the direction of the sun in mid morning when the UVR is most intense may also be a contributory factor[3].

Posterior segment disease was present in 13.0 % of the drivers with optic atrophy and glaucoma predominating. The reason for a high prevalence (8.0%) of optic atrophy accounting for 50.0 % of posterior segment diseases is unknown and would require further investigation. The prevalence of glaucoma was 4%, It was lower than 9.7% reported amongst army drivers in Lagos[12] Nigeria, but higher than 2.7% reported for UCH health workers in 2003.[5] Three of the drivers affected were unaware they had glaucoma, thus the eye examination was a good opportunity for early diagnosis and prompt treatment to prevent blindness. Proximity to UCH did not appear to have influenced their uptake of eye service. Reason for the higher glaucoma prevalence amongst the drivers is unknown. But may however be related to the older age of the drivers (pooling effect) with a mean age of 50 years compared to 42.7years mean age of workers from the previous health workers' study in UCH. Age is a recognised risk factor for the development of glaucoma[13].

Conclusion

Periodic eye examination of public service drivers can help to identify potentially blinding eye conditions such as glaucoma and cataract. Early intervention would thus prevent blindness. Periodic eye examination of drivers (one to two year intervals) after drivers have crossed the age of forty years should be adopted as a policy by public establishments such as the UCH and UI. Legislature and enforcement of eye examinations prior to renewal of drivers licence are options that need adoption by Government. Use of ultraviolet radiation eye protective devices such as sunshade and in the upper part of the windshield of vehicles especially when the sun is overhead during a long journey may help to reduce the risk of anterior segment disease especially with long years of driving. Redeployment of the drivers to an administrative job or other sectors after about 25years driving actively is also recommended.

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