



## Outcome of Visual Screening of Hospital Workers in University of Uyo Teaching Hospital, Uyo, South–South Nigeria

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### Authors' contributions

*This work was carried out in collaboration between all authors. All authors designed the study protocol. Author EOM managed the literature searches and wrote the first draft of the manuscript. Author EGA carried out data analysis and author SIA coordinated data collection processes. All authors read and approved the final manuscript.*

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### ABSTRACT

**Background:** The World Glaucoma Week (WGW) is a joint global initiative of the World Glaucoma Association (WGA) and the World Glaucoma Patients Association (WGPA) to raise awareness of glaucoma. As part of the celebration in 2013, the department of Ophthalmology University of Uyo Teaching Hospital organized a two-day free eye screening exercise for the staff of the hospital to determine the visual health status.

**Materials and Methods:** A prospective observational study of hospital workers in tertiary health institution in Nigeria. Participants who consented to vision screening had preliminary interview and ocular examination. Data obtained was analyzed using SPSS 20.0. Test of statistical significance was with the chi-square test. Observed difference whose probability of occurring by chance ( $p$ -value $<0.05$ ) was considered statistically significant.

**Results:** A total of 401 patients were analyzed comprising 121 males and 280 females with a ratio of 1:2.3. Age range was 18 years to 66 years with a mean  $39.8\pm 9.2$  years. Absolute glaucoma was recorded in 5 patients (1.2%), 71 patients (17.7%) were glaucoma suspects and 19 patients (4.7%) had glaucoma. Refractive error diagnosed in 167 (41.6%) was the commonest finding. There was strong, positive correlation between cup/disc ratio and intraocular pressure in the right eye  $p=0.021$ ,  $p=0.006$ , which were

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statistically significant.

**Conclusion:** The study underscores the need for hospital workers to have routine vision screening with such exercises serving as avenues for health education.

*Keywords: Visual screening; hospital workers; glaucoma; refractive error.*

## 1. INTRODUCTION

The World Glaucoma Week (WGW) is a joint global initiative of the World Glaucoma Association (WGA) and the World Glaucoma Patients Association (WGPA) to raise awareness of glaucoma. Vision 2020, the 'Right to Sight' is being pursued by nations and non-governmental organizations (NGOs). In our setting, regular eye checks are not taken seriously even if the individual works where this is accessible. Visual problems increase as one gets older but this may go unreported for several reasons, including decrease expectations in old age, a belief that nothing can be done to help, failure by the patient to recognize visual loss, and the presence of another handicap that dominates the perception difficulties [1-3]. Other possible inhibiting factors include the fear about surgical treatment and costs and the stigma of blindness [4].

It was the background knowledge of this, that as part of WGW celebration in 2013, the department of ophthalmology, University of Uyo Teaching Hospital organized a two-day free eye screening exercise for the staff of the hospital to determine the visual health status of hospital workers in a tertiary health facility.

## 2. MATERIALS AND METHODS

The vision screening exercise was carried out within the hospital's premises. All the members of staff who consented to verbal and informed written consent were drafted into the study. Other screened individuals who were not hospital staff were excluded from the study. All participants had preliminary interview and ocular examination. Interviewer administered questionnaire was used to obtain bio data, past ocular history, past medical history.

Distant visual acuity was assessed using the Snellen's chart, near vision with near vision chart. Anterior segment examination was done using penlight with x3.5 head loupe. Posterior segment examination was carried out with Heine direct ophthalmoscope. Eyes with opaque media from cataract et cetra were dilated with 1% tropicamide for funduscopy.

Patients with suspicious discs or glaucomatous disc cupping had intraocular pressure (IOP) measured using Perkin's hand-held tonometer. Refractive error was considered as VA<6/6 that improved with Pin Hole or near chart (Rayners chart) less than N6 in the absence of identifiable pathology. The diagnosis of glaucoma was based on cup to disc ratio (CDR) >0.7 with or without intraocular pressure (IOP) greater than 21mmHg. Glaucoma suspects were considered if CDR=0.5 associated with asymmetry of at least 0.2 between the two eyes, notching of neuro-retinal rim and presence of papillary flame-shaped haemorrhages not linked with any other disease. Absolute glaucoma is blindness (No Perception of Light, NPL) due to glaucoma, which has as one of its main features, a fully cupped disc.

Visual field could not be done at the location of the screening and was not considered a diagnostic criterion. Participants with identified eye problems were referred to eye clinic for further evaluation.

Data obtained was coded and entered into SPSS (Statistical Packages for Social Sciences) version 20.0. Data are expressed as Mean±Standard Deviation (SD) and frequency expressed as a percentage. A p-value of 0.05 (i.e. 5%) or less was considered to be significant at a pre-set confidence interval (CI) of 95%.

### 3. RESULTS

A total of 401 patients (802 eyes) were analyzed comprising 121 males and 280 females with a ratio of 1:2.3. Age range was from 18 years to 66 years with a mean of 39.8±9.2 years. The distribution of visual acuity is as depicted in Table 1.

Intraocular pressure ranged from 11 to 33mmHg with a mean of 16.2±4.8mmHg. Absolute glaucoma was recorded in 5 patients (1.2%), 71 patients (17.7%) were glaucoma suspects and 19 patients (4.7%) had glaucoma. Refractive error, 167 (41.6%) was the commonest finding.

Other findings are as shown in Fig. 1. Statistical analysis of data revealed no significant relationship between sex and diagnosis (pvalue=7.967,  $X^2=0.826$ , 95% CI=0.821-0.836) or age and diagnosis (p value=509.522,  $X^2=0.601$ , 95% CI=0.591-0.510). There were no statistical significant associations between blood pressure and right eye CDR (p=0.947), left eye CDR (p=0.586) and right eye IOP (p=0.290). However the association between blood pressure and left eye IOP (p=0.024), was statistically significant.

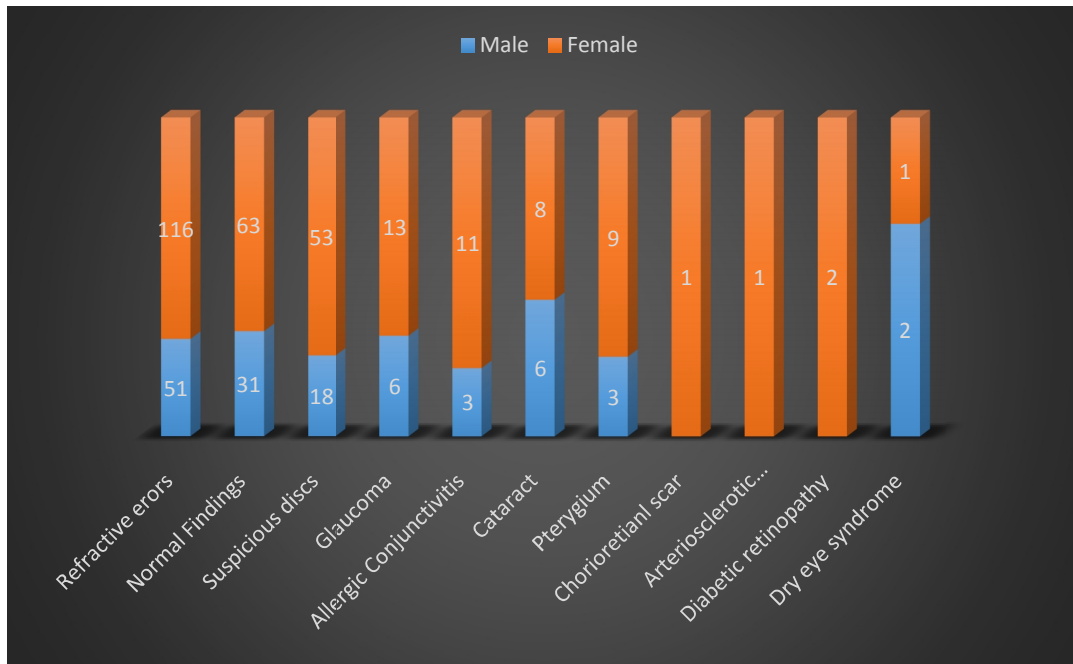


Fig. 1. Diagnosis in all subjects

A Spearman Rank Order Correlation was run to determine the relationship between CDR and IOP. There was strong, positive correlation in the right eye ( $r_s=0.256$ ,  $p=0.021$  [2-tailed]) and left eye ( $r_s=0.304$ ,  $p=0.006$  [2-tailed]) which were statistically significant.

**Table 1. Visual acuity**

	<b>Right eye</b>	<b>Left eye</b>
Visual acuity	Frequency (%)	Frequency (%)
6/18 or better	385 (96.0)	385(96.0)
<6/18 to 6/60	10(2.5)	11(2.7)
<6/60 to 3/60	2(0.5)	0(0)
<3/60 to NPL	4(1.0)	5(1.2)
Total	401(100)	401(100)

#### 4. DISCUSSION

Vision survey remains a useful tool for eye care needs assessment. Most of such surveys have been among school-aged children with a few among occupational groups [5-8]. Surprisingly, hospital workers have not been the focus of such exercises in our environment. The reported findings in our study justify routine health screening among this population of workers who take care of the sick and perhaps forget to take care of themselves.

The mean age in this study was about 40 years. This is in the neighborhood of the averages reported among groups of workers in Birnin-Kebbi (31.7 years), Ughelli (33.6 years), Ile-Ife (41.5 years) and Ibadan (48.3 years) [9-12]. The predominance of refractive errors in this study is attributable to the relatively young population we studied. For a similar reason, in Ibadan refractive error was the commonest cause of visual impairment in a study among commercial drivers [12]. In Enugu, with a prevalent figure of 57.6%, refractive error was the commonest cause of visual impairment among industrial workers [13].

Pterygium constituted 3.0% of our study conducted among hospital workers who work indoors contrary to 27.7% (combined pterygium and pingueculum) in Enugu. The much higher prevalence of pterygium/pingueculum in Enugu could be because the study was carried out among workers exposed to welders' arc who were not wearing appropriate protective spectacles. The prevalence of pterygium among industrial workers in Ughelli was 8% underscoring the influence of outdoor activities in the aetiopathogenesis of pterygium [10].

Previous studies in Nigeria using visual acuity criteria showed that glaucoma is responsible for at least 17.1% of bilateral blindness [14,15]. In our cohort, 1.2% already had absolute glaucoma, 17.7% were glaucoma suspects and 4.7% had glaucoma at least in one eye.

Epidemiological studies have not shown a consistent association between systemic hypertension and glaucoma [16-20]. Methodological aspects may account for these conflicting reports. Of the glaucoma parameters related to BP in our study, only IOP in the left eyes showed statistical significance. CDR in both eyes and IOP in the right eyes were found not have relationship with BP. This observed disparity between the eyes could be due to confounding variables and the fact that glaucoma though bilateral is often asymmetrical. Putatively, it can be deduced from the Baltimore, Barbados, Blue Mountain and Calabar studies that BP has no causal relationship with glaucoma [21-24]. However it may modify in an inconsistent manner some of the established pathogenetic pathways of glaucoma. In the

current study, IOP and CDR showed significant association which underscores the need for effective IOP control in the management of glaucoma.

Cataract being largely age-related was seen in only 3.5% of our study conducted among a relatively young population contrary to 12% reported by Okoye et al. [13]. It is likely that dilated slit lamp examination may reveal additional findings like posterior subcapsular cataract which could influence the prevalence of cataract in our study.

Conjunctivitis was seen in 11(3.5%) of our cohort similar to 3.5% reported by Omoti et al. [10]. The latter study being among industrial outdoor workers, chronic conjunctivitis was reported unlike our study conducted among workers who work indoors, allergic conjunctivitis was noticed. Retinal scar was seen in only 0.025% unlike 2.0% reported by Bekibele et al. [12].

The following limitations have been identified. Our study was conducted among hospital staff such that inferences from it can only be applied to general population with caution due to non-representativeness. The diagnostic criteria for glaucoma was not standardized in view of the limited resources available at the screening site. Central Corneal Thickness (CCT) would have enhanced the reliability of our IOP. Three ophthalmologists were involved in the ocular assessment so that intra-observer variations cannot be ruled out.

## **5. CONCLUSION**

Vision screening programs can identify previously undetected eye disorders in adult populations. Routine vision screening for health workers in addition to timely referral for further evaluation is therefore recommended.

## **CONSENT**

All authors declare that written informed consent was obtained from the patients after appropriately counseling and reassurance.

## **ETHICAL APPROVAL**

All authors hereby declare that this study has been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki.

## **COMPETING INTERESTS**

Authors have declared that no competing interests exist.

## **REFERENCES**

1. Lander R, Popay J. My sight is poor but I'm getting on well. The social care news of the older people with visual problems. *Health Soc. Care.* 1993;1:325-335.
2. Long CA, Holden R, Mulkerrin E, Syken D. Opportunistic screening of visual acuity of elderly patients attending outpatient clinics. *Age ageing.* 1991;20:392-395.
3. Cullinan TR. The epidemiology of visual disability. *Studies of visually disabled people in the community.* Canterbury: University of Kent, (Health services Research unit report No 28; 1997.

4. Reinstein DZ, Dorward NL, Wormald RP, Graham A, O'Connor I, Charlton RM, et al. Correctable undetected visual acuity deficit in patients aged 65 and over attending an accident and emergency department. *Br. J Ophthalmol.* 1993;77:293-296.
5. Ajaiyeoba AI, Isawumi MA, Adeoye AO, Oluleye TS. Prevalence and Causes of Eye Diseases amongst Students in South-Western Nigeria. *Ann Afr Med.* 2006;5(4):197-203.
6. Megbelayin EO, Asana UE. Visual impairment among school children-calabar vision screening survey in secondary schools (CVS4 Study). *Internet Journal of Ophthalmology and Visual Science.* 2013;10(1):1-7.
7. Kehinde AV, Ogwurike SC, Eruchalu UV, Pam V, Samaila E. School eye health screening in Kaduna-Northern Nigeria. *Niger J Surg Res.* 2005;7(2):191-194.
8. Adegbehingbe BO, Oladehinde MK, Majemgbasan TO, Onakpoya HO, Osagiede. Screening of adolescents for eye diseases in Nigerian high schools. *Ghana Med J.* 2005;39(4):138-142.
9. Ayanniyi AA, Chikwe AC. Eye screening for automobile drivers: The need to make it mandatory eye test among automobile drivers. *Sudanese Journal of Public Health.* 2012;7(2):41-46.
10. Omoti AE, Edema OT, Akinsola FB, Aigbotsua P. Non-traumatic ocular findings in industrial technical workers in Delta State, Nigeria. *Middle East Afr J Ophthalmol.* 2009;16(1):25-28.
11. Oladehinde MK, Adeoye AO, Adegbehingbe BO, Onakpoya AO. Visual functions of commercial drivers in relation to road accidents in Nigeria. *Indian J Occup Environ Med.* 2007;11(2):71-75.
12. Bekibele CO, Ajayi R, Asuzu MC. Eye health of professional drivers of a Nigerian University. *Niger Postgrad Med J.* 2009;16(4):256-259.
13. Okoye OL, Umeh RE. Eye health of industrial workers in Southeastern Nigeria. *West Afr J Med.* 2002;21(2):132-137.
14. Ajibode HA. The prevalence of blindness and visual impairment in Ikenne local government area of Ogun State, Nigeria. *Nig J Ophthalmol.* 1999;7:23-27.
15. Nwosu SN. Blindness and visual impairment in Anambra State, Nigeria. *Trop Geogr Med.* 1994;46:346-349.
16. Dielemans I, Vingerling JR, Algra D, Hofman A, Grobbee DE, De Jong PT. Primary open-angle glaucoma, intraocular pressure, and systemic blood pressure in the general elderly population. The Rotterdam Study. *Ophthalmol.* 1995;102:54-60.
17. Mitchell P, Lee AJ, Rochtchina E, Wang JJ. Open-angle glaucoma and systemic hypertension: The Blue Mountains eye study. *J Glaucoma.* 2004;13:319-326.
18. Wu SY, Leske MC. Associations with intraocular pressure in the Barbados Eye Study. *Arch Ophthalmol.* 1997;115:1572-1576.
19. Leske MC, Wu SY, Nemesure B, Hennis A. Incident open-angle glaucoma and blood pressure. *Arch Ophthalmol.* 2002;120:954-959.
20. Le A, Mukesh BN, McCarty CA, Taylor HR. Risk factors associated with the incidence of open-angle glaucoma: The visual impairment project. *Invest Ophthalmol Vis Sci.* 2003;44:3783-3789.
21. Mitchell P, Lee AJ, Rochtchina E, Wang JJ. Open-angle glaucoma and systemic hypertension: The Blue Mountains eye study. *J Glaucoma.* 2004;13:319-326.

22. Tielsch JM, Katz J, Sommer A, Quigley HA, Javitt JC. Hypertension, perfusion pressure and primary open angle glaucoma. A population-based assessment. Arch Ophthalmol. 1996;7:93-98.
23. Leske MC, Connell AM, Wu SY. Risk factors for open-angle glaucoma. The Barbados Eye Study. Arch Ophthalmol. 2002;120:954-959.
24. Megbelayin EO, Utam AA. How does glaucomatous optic nerve disease relate to blood pressure at presentation? Niger J Ophthalmol. 2013;21(1):10-15.

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