"PRELIMINARY FINDINGS OF OCULAR MORBIDITY IN PARTICIPANTS ATTENDING OPHTHALMIC OUTREACH SERVICES IN RURAL NIGERIA"

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ABSTRACT

Background: *This study presents the preliminary findings of an eye care outreach programme in Oginigba, a rural community in South-South Nigeria.*

OBJECTIVES: To determine the patterns of ocular morbidity and visual impairment among residents in Oginigba and to create more awareness of the need for regular eye examination.

METHODS: A descriptive cross-sectional study was carried out on the findings of a 1-day outreach programs at Oginigba in Obio-Akpor Local Government Area of Rivers State, Nigeria. All persons that attended the program were eligible and underwent detailed eye examinations, including visual acuity tests using Snellen charts, intra¬ocular pressure measurements, anterior and posterior segment evaluations and refraction test using Welch Allen streak retinoscope.

RESULTS: Ninety–three subjects were examined. This consists of 30(32.2%) males and 63 (67.7%) females with a mean age of 41.85 ± 13.78 years (range 10 to 70 years). Presbyopia was the commonest ocular morbidity found, accounting for 38.7%, followed by glaucoma (11.8%), allergic conjunctivitis (11.8%), refractive error (6.5%), cataract (3.2%), pseudophakia (2.2%), and pterygium (2.2%). Eighty-one (87.1%) of the subjects had normal vision in their better eye. Eleven (11.8%) of the subjects had low vision and 1 (1.1%) subject was blind. Increasing mean age is associated with poor vision and this finding was statistically significant (F-test=3.78; p=0.001).

CONCLUSION: Eye diseases were common in this rural community as 81.7% of the subjects examined had one form of eye disease or the other. Therefore, screening for eye diseases is important in identifying those participants who are at risk of blindness and in providing the right treatment to them.

KEY WORDS: Oginigba, Presbyopia, Ocular morbidity, Outreach campaign.

INTRODUCTION

The WHO has estimated that approximately 314 million people globally are visually impaired, of whom 45 million are blind[1], with almost 90% of blind and visually impaired people living in low- and middle-income countries. The regions include some of the world's poorest communities, where access to eye care is often unavailable. Although a large percentage of the cases of blindness and visual impairment in these regions is preventable, hundreds of people continue to lose their sight because of lack of access to basic eye care services.[1]
Blindness, according a report from the WHO, is defined as visual acuity of less than 3/60; severe visual impairment is defined as visual acuity between 6/60 and 3/60; and moderate visual impairment is defined as visual acuity of < 6/18 to

6/60, all in the better eye[2]. Blindness prevention is achievable, and this has necessitated the need for various non-governmental organizations working in various communities to reduce the burden of avoidable blindness and visual impairment. Eye diseases causing preventable blindness include cataracts, uncorrected refractive errors, glaucoma, age-related macular degeneration, corneal opacities, diabetic retinopathy, trachoma, and onchocerciasis.[1]

The impact of blindness on low- and middle-income countries, many of which are concentrated in Africa, is enormous[3]. The VISION 2020: The Right to Sight initiative aims to provide primary eye care services in these countries and is focused on identifying and correcting eye disorders[4,5]. This strategy was developed to address issues pertaining to the availability of affordable and accessible ophthalmic services.

Barriers to participants using eye care services at a stage when the disease can be helped or generally prevented have included direct or indirect treatment costs, lack of knowledge of eye problems, fear of knowledge of eye problems, fear that treatment would damage the eyes, transportation problems, lack of family support, and distance n to the hospital.[6] Attempts to address these barriers have focused on improving services to rural areas, primarily through an outreach approach.

This study is relevant because, while some eye conditions are merely causes of ocular morbidity, others invariably will lead to blindness.

This study was therefore designed to supply information about the patterns of preventable high-risk ocular conditions in a rural community in South-South Nigeria.

MATERIALS AND METHODS

Study setting and area

The Siloam eye foundation, a registered NGO in Port Harcourt, conducted a one-day eye screening outreach programme to assess ocular diseases among residence in Oginigba, a rural community in the Obio-Akpor local government area of Rivers State in the Niger delta region of Nigeria. This outreach was to address blindness in rural communities and to ensure the implementation of regular eye examinations as recommended by the WHO's Vision 2020: The Right to Sight initiative.

Study Population

All participants who attended the ophthalmic outreach campaign were enlisted for this study with their informed consent taken. The subjects are predominantly subsistence farmers, fishermen and women, petty traders, retired civil servants and local government staff.

Study design

A descriptive cross-sectional study involving 93 subjects from a rural outreach in Rivers State.

Procedure

After receiving consent, participants' biodata and relevant medical history were obtained, after which ocular examinations were conducted. Visual acuity (aided, unaided and pinhole) was assessed using a Snellen chart. External examination was performed using a pen torch. Fundoscopy was performed using a Keeler ophthalmoscope. Visual acuity was tested in the open under bright daylight and was classified in accordance with the WHO criteria. By these criteria, a visual acuity of 6/18 or better was considered normal vision, a visual acuity <6/18 to 3/60 was considered low vision, and a visual acuity less than 3/60 was considered blindness. Respondents with visual acuity (VA) less than 6/9 were refracted for both distance and near with the use of a trial frame for lenses, and a Welch Allen streak retinoscope. Those who failed to identify the largest test type (6/60) were asked to count fingers at less than six metres. If they failed to count finger at less than one metre, they were tested for hand motion. If they fail to perceive hand motion, the acuity is tested with a bright source of light.

Participants with VA of 6/9 or better and a near acuity of < N5 were subjected to near refraction. Myopes with a visual acuity of 6/12 or worse were also made to wear their correction before taking the near visual acuity test. Participants who could not read N6 were considered as presbyopes.

Fundus examination through a dilated pupil was made whenever necessary and when the media was clear.

Ophthalmologic disorders were diagnosed in accordance with WHO international statistical criteria, as permissible in a field situation. Cataract was defined as loss of lens transparency irrespective of the visual acuity status. Glaucoma was defined as an IOP greater than 21 mm of mercury (Hg) with glaucomatous cupping of the optic disc or as a high intraocular pressure over 35 mm Hg with fixed and dilated pupil.

Participants with minor or simple eye problems such as conjunctivitis or simple errors of refraction were treated and given free corrective eye glasses to improve their sight. Persons with more complicated problems such as glaucoma or cataract were referred to the Eye clinic of the University of Port Harcourt Teaching Hospital (UPTH) for further examination and management.

Statistical analysis

The data collected were analysed using the statistical software package Epi Info version 7 manufactured by the Centre for Disease Control & Prevention (CDC) in 2001. Quantitative variables were expressed as the mean ± standard deviation (SD). Frequency was presented in percentages. Analysis of Variance (ANOVA), also referred to as the F-statistics and p-value were used to determine statistical significance between continuous variables of three means and above, and a chi-squared test with p-value was used to determine statistical significance between categorical variables. The level of significance considered to support our hypothesis was $p \leq 0.05$. Fisher's exact test was recommended when an expected value was less than 5.

RESULTS

Of the 93 subjects who attended the eye health outreach, nearly twice as many women as men were examined, 63 (67.7%) and 30 (32.3%), respectively, with a statistically significant F/M ratio of 2:1 ($p<0.05$, chi-square ($\chi 2$) = 23.42, p=*0.001*). Subjects were from all age groups; the mean age (±SD) was 41.85 (±13.78) years, ranging from 10 to 70. Subjects were predominantly adults, with the 40-49 and 50-59-year age groups accounting for 45.0% of the subjects. Subjects below 35 years of age comprised 32.0% of the study population. The subjects were mainly traders, 36 (38.7%), and civil servants, 20 (21.5%). A good number of them were indigenes of the community we visited (34.4%) (Table 1).

Table 1: Socio demographic characteristics of participants

Socio-demographic characteristics	Percentage (%) n=93	95% (C.I)
Gender		
Male	30 (32.3)	22.93 - 42.75
Female	63 (67.7)	57.25 - 77.07
Chi -squàre (?2)(p value)		23.42 (0.001)*
Age Group (In Years)		
10 - 19	3 (3.2)	0.67 - 9.14
20 - 29	19 (20.4)	12.77 - 30.05
30 - 39	17 (18.3)	11.02 - 27.65
40 - 49	24 (25.8)	17.29 - 35.92
50 - 59	18 (19.4)	11.89 - 28.85
60 - 69	11 (11.8)	6.05 - 20.18
70 - 79	1 (1.1)	0.03 - 5.85
Occupation		
Trading	36 (38.7)	28.78 - 49.38
Civil servant	20 (21.5)	13.66 - 31.24
Clergy	2 (2.2)	0.26 - 7.55
Farmer	5 (5.4)	1.75 - 12.10
Professional (Doctor, Engineer)	5 (5.4)	1.75 - 12.10
Student	12 (12.9)	6.85 - 21.45
Self-employed	2 (2.2)	0.26 - 7.55
Unemployed	6 (6.5)	2.40 - 13.52
State Of Origin		
Abia	9 (9.7)	4.52 17.58
Akwa-Ibom	21 (22.6)	14.55 - 32.42
Bayelsa	1 (1.1)	0.03 - 5.85
Calabar	1 (1.1)	0.03 - 5.85
Cross-River	6 (6.5)	2.40 13.52
Edo	1 (1.1)	0.02 - 5.85
Imo	19 (20.4)	12.77 - 30.05
Ogun	2 (2.2)	0.26 - 7.55
Osun	1 (1.1)	0.02 - 5.85
Rivers	32 (34.4)	24.86 - 44.98

* *Statistically significant (p<0.05)*

Table 2:
Visual Acuity in the better Eye (RE) and Mean Age

Visual Acuity	Total (n=93) Freq (%)	Age (Mean ± SD)	ANOVA (F-statistics)	*p*-value
Normal (6/18 or better)	81 (87.1)	40.64± 13.15	3.78	0.001*
Low Vision (<6/18 ≥3/60)	*11 (11.8)*	*48.55± 15.60*		
Blindness (<3/60)	*1 (1.1)*	*66.0± 0.00*		

**Statistically significant (p<0.05)*

Of the total subjects examined, 81 (87.1%) had normal visual acuity (VA) (6/18 or better) with a mean age of 40.64 ± 13.15. Eleven (11.8%) subjects had low VA (<6/18_≥ 3/60) with a mean age of 48.55 ± 15.60, while one subject (1.1%) had blindness with a mean age of 66±00 (Table 2). Vision deteriorated with increasing age and this difference was statistically significant (F-test=3.78; p=*0.001*)

Table 3:
Visual Acuity in the better Eye (RE) and Sex

Visual Acuity	Sex Freq (%)		Chi-square (x2)	p-value
	Male (n=30)	Female (n=63)		
Normal (6/18 or better)	27 (29.0)	54 (58.1)	5.68	*0.01**
Low Vision (<6/18 ≥3/60)	2 (2.2)	9 (9.7)	4.21	*0.04**
Blindness <3/60)	1 (1.1)	0 (0.0)		*0.505*[#]

**Statistically significant (p<0.05) #Fisher exact*

Of the 81 participants who had normal VA, 27 (29%) were males and 54 (58.1%) were females, and this difference was statistically significant: p<0.05 (Chi-square (χ2) = 5.68, *p=0.01*). Among participants with low VA, 2 (2.2%) were males and 9 (9.7%) were females, and this difference was also statistically significant: p<0.05 (Chi-square (χ2) = 4.21, *p=0.04*). Only one blind male patient was observed (Table 3).

Table 4: Ocular Findings

*Ocular Findings	Age Group		Total	95% CI
	<35 Freq (%) (n=27)	>35 Freq (%) (n=66)		
Allergic conjunctivitis	6 (6.5)	5 (5.3)	11 (11.8)	4.05-20.18
Aphakia	0 (0.0)	1 (1.1)	1 (1.1)	0.03-5.85
Cataract	0 (0.0)	3 (3.2)	3 (3.2)	0.67-9.14
Cornea opacity	0 (0.0)	1 (1.1)	1 (1.1)	0.03-5.85
Dry eye	0 (0.0)	1 (1.1)	1 (1.1)	0.03-5.85
Glaucoma	4 (4.3)	7 (7.5)	11 (11.8)	4.05-20.18
Optic atrophy	0 (0.0)	1 (1.1)	1 (1.1)	0.03-5.85
Pathological myopia	1 (1.1)	0 (0.0)	1 (1.1)	0.03-5.85
Pseudophakia	0 (0.0)	2 (2.2)	2 (2.2)	0.26-7.55
Presbyopia	2 (2.2)	34 (36.6)	36(38.7)	28.78-49.38
Pterygium	0 (0.0)	2 (2.2)	2 (2.2)	0.26-7.55
Refractive error	4 (4.3)	2 (2.2)	6 (6.5)	2.40-13.52
Normal	10 (10.8)	7 (7.5)	17 (18.3)	11.02-27.65

Chi - square (x2)=35.00, p=0.001

The distribution of various ocular diseases in the study population is shown in Table 4. Eye diseases were more frequent in ages above 35, accounting for 63.45%, while ages below 35 accounted for 18.3%. This difference was also statistically significant: p<0.05 (Chi-square (x2) = 35.00, p=0.001). Presbyopia was the most common ocular morbidity, occurring in 36 subjects

(38.7%), followed by allergic conjunctivitis and glaucoma, found in 11 subjects each (11.8%). Refractive error was observed in 6 (6.5%) subjects. Cataract was observed in 3 (3.2%) subjects. Pseudophakia and pterygium were found in 2 (2.2%) subjects each. Aphakia, cornea opacity, dry eye, and optic atrophy were observed in one subject each (1.1%). All presbyopia subjects were refracted, and glasses were prescribed. The mean power of the correction was 2.29DS ± 0.73.

Discussion

This study assessed the preliminary findings of ocular morbidity in a rural community and it was shown that ocular diseases were commoner in participants that were older than 35 years of age. There were more women than men, at a ratio of 2:1. This ratio is in contrast with the general observation that fewer females than males are seen in medical facilities in developing countries[7].This situation may present different demographics because it was based on an outreach campaign.

The lower percentages of children and young adults in our study may be a result of the fact that these age groups usually do not have eye problems and did not think it necessary to present for an eye examination. This fact is corroborated by the findings of a very low occurrence of eye disorders in these age groups, based on the results of other studies.[8,9]

The most common ocular morbidity among the study subjects was presbyopia, which was found in 38.7%, followed by allergic conjunctivitis (10.8%) and glaucoma (10.8%). Refractive error was present in 6.5%. Other ocular disorders observed were cataract (3.2%), pseudophakia (2.2%), and pterygium (2.2%). Aphakia, cornea opacity, dry eye, optic atrophy, and pathological myopia were observed in a relatively small number of subjects. The pattern of occurrence of ophthalmologic disorders were like those in other communities in Rivers State.[10,11]

By comparison, a clinic-based survey of several rural eye clinics in Cambodia showed that cataract, refractive error, and glaucoma were the most common diseases observed in those communities[12]. In a similar survey of ophthalmic conditions in rural Lesotho, conjunctivitis, refractive errors, cataract, and glaucoma were the most common conditions found[13]. Similar results were also reported in a study conducted in Nigeria by Adegbehingbe and Majengbasan (2007) who found in their study that a significant proportion (13.5%) of rural dwellers in south-western Nigeria community had ocular diseases which require treatment[14].

Onchocerciasis was also not observed because the community has no fast-flowing rivers and has a good source of drinking water in the vicinity. Glaucoma and cataract, which together constitute the leading causes of blindness, were common among the elderly participants observed. Subjects with glaucoma were counselled and initial therapy was administered before they were referred to the ophthalmology unit of the University of Port Harcourt Teaching Hospital (UPTH) for comprehensive eye care. The early detection of glaucoma during this survey reinforces the need for periodic eye examination as a strategy for early detection, intervention, and the prevention of blindness in the community[1].

Three participants who had cataract were referred to UPTH for cataract surgery. Two subjects were also observed to have pterygium and were referred for pterygium excision. Consistent with more widespread findings1, visual impairment and blindness are age-related. In this study, vision deteriorated with increasing mean age, and this difference was statistically significant (F-test=3.78; p=0.001) (Table 2).

Similarly, subjects with pseudophakia had the highest mean age (63.00 ± 9.89), followed by subjects with cornea opacity (62.00 ± 0.00), dry eye (60.00 ± 0.00), pterygium (56.50 ± 17.68), aphakia (55.00 ± 0.00), and glaucoma (48.00 ± 18.78). These differences were statistically significant (F-test=2.06, p<0.001).

Allergic conjunctivitis and refractive error were observed, on average, in much younger subjects (22.05 ± 15.67, 32.33 ± 11.38).

Limitations

The outreach was a one-day programme, so an initial community demographic study was not possible. Population sampling for evaluation was not possible. Data collection was based on those that responded to the offer for a free eye examination. Coverage was low because only those who thought they had some sort of eye problem came for the screening. Therefore, results from such an outreach programme do not provide a representative sample of the degree of occurrence of eye diseases in the community under study and are subject to several biases. However, the findings from this study gives insight to the importance of planning for eye care services and give the basis for larger study

CONCLUSIONS

This study highlights the need for a community outreach programme to help identify preventable and high-risk ocular conditions in communities without access to eye care facilities.

The need for strategies to improve the use of eye care programmes is further emphasized and strategies for improved education among community residents on the importance of regular eye check-ups are urgently needed to ensure a reduction in cases of blindness and an improvement of rural eye care in Nigeria, in accordance with the objectives of the WHO's VISION 2020 initiative.

REFERENCES

1. World Health Organization (WHO). Action Plan for The Prevention of Avoidable blindness and visual impairment 2009-2013. Retrieved Electronically: www.who.int/blindness/ACTION_PLAN_WHA62-1-English.pdf
2. The Prevention of Blindness. Report of WHO Study Group. Geneva, World Health Organization, 1973 (WHO Technical Report Series, No. 518)
3. Köberlein J, Belfus K, Schaffert C, Finger RP. The economic burden of visual impairment and blindness: a systematic review. *BMJ Open* 2013; **3**: e003471.doi:10.11367bmjopen-2013-003471.
4. Kyari F. Vision 2020: The right to sight- the concept, the plan. *Ann Afr Med* 2003; **2**: 39-46
5. Adio AO, Nathaniel GI. Vision 2020, the right to sight: where exactly are we in Nigeria. *Nig J Med* 2013; **22**: 246-251
6. Fletcher AE, Donoghue M, Devavaram J, Thulasirai RD, Scott S et al. Low Uptake of Eye Services in Rural India A Challenge for Programs of Blindness Prevention. *Arch Ophthalmol* 1999; **117**:1393-1399
7. KC RM, Ale JB, Singh SK. Pattern of blindness in Mechi-a hospital based study in Mechi eye care centre. *J Nepal Med Assoc*, 1998; **37**: 422-6.
8. Omoni AO. The epidemiology of blindness and visual impairment in a fishing village in Rivers state, Nigeria. *The Nig Hlth J* 2005; **59**(1/2):256-260.
9. Pedro-Egbe CN, Babatunde S, Ezepue UF. Age and sex distribution of blindness in Ahoada-East local government area, Rivers state, Nigeria. *PMJ* 2007;**1**(2):99-103.
10. Wokoma FS, Nwokocha C, Aliu R, Okuru G. Blindness and visual impairment in Okoboh-a Rural community in the Abua-Odual local government area of Rivers state: findings of a one-day Rotary eye camp. *PMJ* 2008;**3**(1)77-84.
11. Patrick-Ferife B, Ashaye AO, Quershi BM. Blindness and low vision in adults in Ozoro¬ rural community in Delta state Nigeria. *Nig Med J* 2005;**12**(4):387-390.
12. Thomson I. A clinic based survey of blindness and eye diseases in Cambodia. *Br. J. Ophthal*.1997; **81**: 578-80.
13. Yitzhak JG, Mokete M (1980). Survey of ocular conditions in rural Lesotho. *Documenta Ophthalmologica*. 1980; **49**: 285-91.
14. Adegbehingbe BO, Majengbasan TO. Ocular health status of rural health workers in south western Nigeria. *Aust. J. Rural Health*. 2007; **15**: 269-7