

The Burden of Low Vision in Farming Communities in South-South Nigeria

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ABSTRACT

BACKGROUND: The impact of low vision (visual impairment categories 1 and 2) is felt more in developing countries of the world due to the problems of access to effective eye care. In severe cases it leads to social problems with economic implications. When children are involved, learning is affected leading to dependence even when they become adults and the community also suffers from this. Effective care, more often than not, brings about cure in some cases but unfortunately, access to this care is denied for reasons ranging from ignorance and harmful traditional practices to lack of commitment by governments.

OBJECTIVE: To determine the prevalence and causes of low vision in some farming communities in South-South Nigeria in order to proffer solution on its prevention and possible management.

METHODS: A cross-sectional, population based, multi-stage survey was carried out between the 8th of September and 20th of October, 2007 to determine the burden of low vision. Households were picked from seven villages selected from seven communities by random sampling in Ikwerre Local Government Area of Rivers State. Basic eye examination involving visual acuity assessment, pen torch examination, funduscopy and intraocular pressure measurement was done. Refraction was manually done and high plus (+8 to + 10) lenses used for aphakics. Visual field was assessed using confrontation method. Data was recorded with World Health Organization Prevention of Blindness (WHO/PBL) form.

RESULTS: A total of 754 males and 759 females were examined, giving a male to female ratio (M: F) of approximately 1:1. The prevalence of low vision was 5.5% (category 1: moderate visual impairment = 4.1% and category 2: severe visual impairment = 1.4%). There were more females (51.8%) with low vision than males (48.2%) most of them being more than 50 years old. No child below 10 years had low vision though those between 10-19 years made up 1.78% of all case of low vision.

The commonest causes of low vision were refractive error (50.6%), cataract and aphakia (26.5%), glaucoma (8.5%), optic atrophy (8.5%), while others contributed 10%.

CONCLUSION: The management of low vision should target vulnerable groups (females and those >50 years) through effective planning and implementation of programs for prevention of blindness, outreach programs for enlightenment about causes and the use of low vision aids, making treatment affordable, training of health personnel on basic eye care and establishment of a functional state program for blindness prevention.

KEY WORDS: Low vision, Burden, Farming Communities, South-South Nigeria.

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INTRODUCTION

Low vision (visual impairment categories 1 and 2) is an important public health problem with serious socioeconomic consequences worldwide¹. This study utilized the WHO definition of low vision as applied by low vision specialists with modification to include untreated cataract and refraction by the use of pinhole and high plus lenses. It states that “a person with low vision is an individual, who after refraction and medical or surgical treatment, has a best corrected visual acuity of <6/18 to =3/60 in the better eye, but who uses, or has the potential to use the vision for the planning and/or execution of task”².

Poor attention given to it has led to social dependence and loss of productivity especially in developing countries³.

Ignorance, infections, malnutrition, and inadequate eye care services have all contributed to the rise in the prevalence of low vision. This is worsened by poor rehabilitative and supportive measures due to lack of government commitment⁴.

The major causes of low vision in Nigeria are refractive errors, cataract, glaucoma, and optic atrophy and this follows a similar trend in other developing countries⁵. It is estimated that 124 million people worldwide have low vision⁶ and 4.08 million of them are in Nigeria¹.

People with low vision and the prognosis of eventual blindness are at comparable high risk of suicide and thus may be in need of supportive services such as establishment and extension of therapeutic and preventive programs are strongly advocated and should incorporate mental health professionals. This will prevent the onset of depression and avoid self destructive behavior. Seeking the support of other people affected is a good therapy to overcome the disability, not only for the individual affected but for their families as well.

This study is therefore aimed at determining the prevalence and causes of low vision in some farming communities in South-South Nigeria in order to assist eye care policy formulators, implementers and eye care

providers on its prevention and possible management. Data on the prevalence and causes of low vision are limited and urgently needed for rational planning of low vision services.

MATERIALS AND METHODS

Ethics approval was obtained from the University of Port Harcourt Teaching Hospital and consent from the subjects. The state ministry of health and community heads were duly informed and approval granted.

Ikwerre Local Government Area (LGA) is one of the upland LGAs of River State. It is made up of thirteen communities. The LGA is located between latitude 4° 15' and 4° 50' north and longitude 6° 30' and 7° 15' east. Its land mass is about 2,400sq km i.e. About 20% of the total cultivable land in the whole of Rivers State.

Projected from the 2006 census population figure of 430,000 at an annual growth rate of 2.7%, the population of the LGA is 441,610.

The ethnic group is Ikwerre and the language spoken is also Ikwerre. Ikwerre is the largest ethnic group in Rivers state. The people are mainly farmers and they grow cassava, yam, palm oil and cocoyam predominantl. Water supply is mainly from boreholes and streams. Being the largest ethnic group and owing to its central location in the state it was thought that a study here would be representative.

There are 14 Primary Health Centres, five Secondary Health facilities and one tertiary health facility. University of Port Harcourt Teaching Hospital is partly located in the LGA. There are also 12 private health facilities in the LGA. In all there are 32 health facilities in the LGA and these provide only skeletal eye care services.

A minimum sample size of 1513.3 was calculated using standard methods⁷. The study utilized the multistage random sampling method. First-stage sampling was selection of communities where the 13 communities in the LGA formed the sampling frame. Seven (>50%) communities were randomly selected by balloting. Second-stage sampling was selection of villages from a list of villages in each community selected. One village was selected by balloting from each community to make up seven villages. Third-stage sampling was selection of households and the size of the villages determined the number of households selected. It was assumed that at least 6 persons would make up a household. The required sample size for each village was then divided by 6 to get the number of households (eg. 91/6=15.2 households for Apani, etc). More households were therefore selected from larger villages. A Table of Random Numbers was used for this.

Every resident in a selected household formed part of the survey. Individuals in the households were examined beginning with visual acuity (VA) in day light using Snellen's illiterate chart. Pictorial chart was used for children between 4 to 6 years old while central fixation was tested for those less than 4 years. Visual acuity (VA) with pinhole and subjective refraction were done for those with VA <6/18 while aphakics were tested with +10 diopter sphere lens.

The external and anterior segment of the eye were examined with a pen torch followed by direct ophthalmoscopy. Perkin's applanation tonometry was done to determine the intraocular pressure of those with cupped discs (C/D ratio >0.5). Diagnosis was made clinically and where two disease conditions were identified in the same eye, the one implicated more in lowering the patient's vision was considered to be the cause of low vision in that eye. Data was entered into the WHO/PBL form and analyzed with statistical package for social sciences (SPSS) version 11.

The tools used to examine the subjects in the survey include: -WHO / PBL Eye Examination Record form, Visual acuity charts (Snellen's, E-, Pictorial), Pin hole / + 10 dioptersphere lens, Pen torches, Direct ophthalmoscope / magnifying loupe, Perkin's applanation tonometer, Mydriacyl 0.5% eye drop / Pilocapine 4% eye drop, Tetracaine 1% eye drop, Fluorescein drops.

RESULTS

The age group of 0-19 years had the highest population of those examined (31.5%) while those above 80 years had the least (1.8%). Males contributed 49.8% of those examined and also had lower prevalence of category 2 (severe) visual impairment (43%), while females contributed 50.2% with a prevalence of 57%. See tables 1 and 2.

A total of 1513 individuals were examined giving a very good coverage of 98.8%. Eighty three persons had low vision (95% CI), 62 of them with category 1 (moderate) visual impairment and 21 with category 2 (severe) visual impairment. See table 3.

Isiokpo community with many health facilities had the least prevalence of low vision (2.6%) while Ipo and Apani with limited number of health facilities had the highest of 10% each (table 4).

The top three causes of category 1 (moderate) visual impairment were refractive errors (64%), cataract and aphakia (21%) and optic atrophy (8%) while the top four causes of category 2 (severe) visual impairment were cataract (42%), glaucoma (28%), optic atrophy (10%) and refractive errors (10%). See table 5.

Table 1: Age distribution of low vision (visual impairment categories 1 & 2)

S/N	Age group (yrs)	No Examined (%)	VI category 1 No (%)	VI category 2 No (%)	Total VI No (ASP*)
1	0-19	476 (31.5)	4 (6.5)	0 (0.0)	4 (1.78)
2	20-39	420 (27.8)	6 (9.7)	1 (4.8)	7 (3.24)
3	40-59	400 (26.4)	24 (38.7)	4 (19.0)	28(14.45)
4	60-79	189 (12.5)	27 (43.5)	11 (52.4)	38(49.98)
5	80-100	28 (1.8)	1 (1.6)	5 (23.8)	6 (21.43)
	Total	1513 (100)	62 (100)	21 (100)	83 (5.49)

VI = Visual Impairment, ASP* = Age Specific Prevalence derived from total no. examined.

Table 2: Sex distribution of low vision (visual impairment categories 1 & 2)

S/N	Sex	Number examined	VI category 1 no (%)	VI category 2 no. (%)	Total No (%)
1	Male	754 (49.8)	31 (50.0)	9 (43.0)	40 (48.2)
2	Female	759 (50.2)	31 (50.0)	12 (57.0)	43 (50.8)
	Total	1513 (100.0)	62 (100.0)	21 (100.0)	83 (100.0)

Table 3: Low vision in the seven communities

s/n	Categories of low vision	Number of persons	Prevalence (%)
1	Visual impairment category 1 (moderate VI) (VA < 6/18 e 6/60)	62	4.1
2	Visual impairment category 2 (severe VI) (VA < 6/60 e 3/60)	21	1.4
	Total	83	5.5

Table 4: Community Specific Prevalence (CSP) of low vision

S/N	Community	Number examined	Category 1: moderate visual impairment and (CSP)	Category2: severe visual impairment and (CSP)	Total (CSP)
1	Apani	100	7 (7.0)	3 (3.0)	10 (10.0)
2	Elele	413	17 (4.1)	6 (1.5)	23 (5.6)
3	Ipo	50	4 (8.0)	1 (2.0)	5 (10.0)
4	Isiokpo	350	7 (2.0)	2 (0.6)	9 (2.6)
5	Omerelu	200	12 (6.0)	4 (2.0)	16 (8.0)
6	Ozuaha	150	3 (2.0)	1 (0.6)	4 (2.6)
7	Ubima	250	12 (4.8)	4 (1.6)	16 (6.4)
	Total	1513	62(4.1)	21(1.4)	83 (5.5)

Table 5: Causes of low vision

s/n	Causes	Visual impairment category 1(%)	Visual impairment category 2(%)	Total (%)
1	Cataract +Aphakia	13 (21.0)	9 (42.0)	22 (26.5)
2	Glaucoma	1 (1.5)	6 (28.0)	7 (8.5)
3	Optic atrophy	5 (8.0)	2 (10.0)	7 (8.5)
4	Chorioretinitis	2 (4.0)	1 (5.0)	3 (3.5)
5	Maculopathy	0(0.0)	1 (5.0)	1 (1.2)
6	Refractive error	40 (64.0)	2 (10.0)	42 (50.6)
7	Retinitis pigmentosa	1 (1.5)	0(0.0)	1 (1.2)
	Total	62 (100)	21 (100)	83 (100)

DISCUSSION

There were more females (57%) with severe visual impairment (SVI) than males (43%). This may be due to the fact that men, who are the usual breadwinners in developing countries, are given more priority in health care.

No child under the age of 20 years had SVI even though they accounted for most of those examined (31.5%) while those above 60 years accounted for 76.2% of SVI with a population of only 14.3%.

The prevalence of low vision in this study was 5.5% (category1: moderate visual impairment = 4.1% and category2: severe visual impairment = 1.4%) with a 95% confidence interval (CI). This prevalence is comparable to the national value of 6.1% (5.3% for moderate VI and 0.8% for severe VI), though the national survey was for individuals above 40 years old and utilized "presenting" rather than best "corrected" visual acuity⁸. The national study also showed that in the South-South geopolitical zone (GPZ) of the country, the prevalence of severe VI was 1.78% and that for moderate VI was 13.7% even though the demographic characteristics differ. Other studies done in the South-South GPZ showed higher prevalence of low vision than the values in this study. This could be attributed to the greater sample size in this study and the presence of many health facilities in this study area compared to other South-South communities where similar studies were carried out^{9,10,11}.

The high prevalence of low vision in this study could be said to be due to ignorance, poverty, harmful traditional practices and inhibitions since the people in this study are mostly illiterate and poor.

Communities like Isiokpo with many health facilities had low prevalence of low vision (2.6%). Ozuaha located near many health facilities had lower prevalence of low vision (2.6%) than those far away from these facilities e.g Ipo (12%).

Refractive error was the commonest cause of low vision accounting for 50.6% of all cases while cataract and aphakia (42%) accounted for most cases of category2 (severe VI) low vision. This could be due to poor access to health facilities in some of the communities. Optic atrophy was third commonest cause of low vision probably due to high consumption rate of cassava in these communities since its cyanide and coumarin contents are suspected to be associated with optic atrophy^{12,13}.

Most of the causes of low vision in this study are attributed to treatable causes¹⁴ and comparable to global findings¹⁵, national survey findings⁸ and findings in some communities in South-South⁹.

Increasing the cataract surgical rate by making cataract surgeries more affordable, improving access to health facilities and getting the government more involved may

reduce the prevalence of severe visual impairment. This is because cataract is the commonest cause of severe visual impairment (SVI). The possibility of reducing cyanide and coumarin levels in processed cassava should be further explored since optic atrophy, associated with them, is the 3rd commonest cause of SVI.

Low vision category2, which is also severe VI, poses more problems than the category1 (moderate VI), as the individual affected has less potential to use vision for planning and/or execution of a task. There is also prognosis of eventual blindness and possibility of suicide⁶ a worrying implication.

Public enlightenment on the need for a comprehensive eye examination, at least once every year, by all especially those above 40 years which can help detect glaucoma early and prevent it from causing severe visual impairment is highly recommended.

The main limitation in this study is having to examine so many subjects over a short period and absence of some members of some households in the study period. In conclusion, emphases should be placed on prevention of avoidable causes of low vision. The general population should be encouraged to go for regular eye checks. The government should be more involved in the provision of adequate eye care facilities in order to effectively manage cases of low vision. These should be pursued in order to meet the WHO target of vision 2020.

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