The Burden of Blindness According To Age and Sex In Some Communities In Niger Delta Of Nigeria

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ABSTRACT

Background: There are differences in the impact of blindness by age and sex; blind males having a higher risk for death than females. The aim of this study was to describe the age and sex difference among the blind in some Niger Delta communities of Nigeria.

Methods: A community based, cross-sectional study was done and age and sex data analyzed for the 19 blind persons seen. A total of 1513 subjects were studied and their ages estimated from historical events or verified from hospital/immunization cards. Ocular examination of subjects included visual acuity, pen torch examination, fundoscopy and applanation tonometry.

Results: A total of 1513 subjects were examined consisting of 754 males and 759 females. Subjects less than 20years accounted for 31.5%, those above 60years accounted for 26.4% while others contributed 42.1%. All the 19 blind persons were over 50years. The difference in age among the blind was statistically significant ($p<005$). The sex specific prevalence for blindness was 0.79% for males and 1.71% for females. Females were more likely to be blind than males.

Conclusion: The study found blindness to be commoner in older age groups and female gender appeared to be an important risk factor. Eye health education should target the elderly and females more and factors contributing to their vulnerability addressed.

Keywords: Blindness; Age; Sex; Niger Delta; Nigeria

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INTRODUCTION

The global prevalence of blindness is 0.7% ranging from 0.3% in the developed countries to 1.4% in sub- Saharan Africa[1].

Blindness constitutes serious public health and socio-economic problem for individuals and communities especially in developing nation where 90% of all blind persons are found[2], especially as blindness leads to loss of productivity and social dependence.

Blindness impedes learning in children and proper development while it prevents adults from finding gainful employment. This situation results in increased pressure on social welfare resources.

People who are blind are at an increased risk of death, and this seems to be related to age and sex[2] in the USA, the overall risk of death is 1.45% for the blind and 2.5% higher for blind males than females. In Tanzania, the mortality rate for blind persons aged 40-79 years is 3.3 times higher than for eye matched controls[3]. It is important to know the vulnerable age groups and sex distribution of blindness in our locality as this will help in planning blindness prevention programs.

This aim of this study was to determine the burden of blindness according to age and sex in some communities in Niger Delta of Nigeria, in order to generate additional data for the national data bank, which will be useful for effective planning and implementation of eye care services in the state in line with the National Programme for the Prevention of Blindness. Other objectives were to compare blindness data obtained with that from other parts of the country in addition to making recommendations on blindness prevention. This importance of this survey is justified by the need for population based studies like this which will provide a more accurate assessment of the blindness prevalence in contrast to hospital based studies which provide most of the blindness data available in Nigeria. Furthermore data from population-based studies are encouraged by the NPPB, as they are more accurate and better for both short and long term planning for blindness prevention.

MATERIALS AND METHODS

A community based cross-sectional and multistage sampling techniques were used to select 1513 persons in seven out of thirteen communities of Ikwerre local Government Area of Rivers State between the 8th of September and 20th of October 2007.

Ethical clearance was obtained from the University Of Port Harcourt Teaching Hospital Ethics Committee and those in the study gave informed consent.

Definition of blindness In order to make the data on blindness comparable worldwide and acceptable, the World Health Organisation (WHO) Programme for Prevention of Blindness (PBL) recommended the definition of blindness as incorporated in the International Statistical Classification of Disease, and Related Health Problems, tenth revision (ICD-10)[1]. This defines blindness as visual acuity less than 3/60 or corresponding visual field less than 10^0 in the better eye with best possible correction (visual impairment categories 3, 4, and 5 in ICD-10); and low vision as visual acuity less than 6/18 but equal to or better than 3/60 in the better eye with the best correction (Visual Impairment Categories 1 and 2 in ICD-10). This

definition of blindness was utilized in this study.

The WHO estimate for the prevalence of blindness in Nigeria is 1% and the population of the local Government Area was 441,610 projected from 2006 census. The sample size was estimated using the formula: $n = \frac{Z^2 Pq}{d^2}$ with 95% confidence Interval and sampling error set at 5%.[7]

Where:

n = minimum sample size

Z = standard normal deviation corresponding to the probability of an error of 0.05 and is equal to 1.96

p = The prevalence = 1%

q = 1 p = 1 0.01

d = Precision (the margin of sampling error tolerated) = 0.5%

$$\therefore n = \frac{1.96^2 \times 0.01 \times (1-0.01)}{0.005 \times 0.005} = 1521.3$$

The minimum sample size was 1521.3

In the first stage sampling, seven (>50%) communities were randomly selected by balloting from the thirteen communities in the LGA which formed the sampling frame. In the second Stage Sampling, one village was selected also by balloting from a list of villages in each community selected. The third- stage sampling involved the selection of households. The size of each village selected determined the number of households selected. It was assumed that at least 6 persons made up a household. The required sample size for each village was then divided by 6 to get the number of households.

Everybody in the selected households was examined beginning with visual acuity. This was tested under daylight with Snellen's illiterate chart. Each eye was tested separately at 6 meters and where the subject could not see 6/60, the test was repeated at 3 meters. Pictorial chart was used to test the vision of children between the ages of 4 and 6 years old while those less than 4 years had their central fixation tested. Visual acuity was repeated with pinhole if it was less than 6/18 and aphakics were tested with a +10 dioptre sphere lens.

The lids, conjunctiva, cornea, anterior chamber and pupils were examined with a pen torch this was followed by ophthalmoscopy with a direct ophthalmoscope. Intraocular pressure measurement was done for subject with cupped optic discs (C/D ratio of > 0.5) using Perkins applanation tonometer after applying 1% tetracaine and fluorescein eye drops. The WHO/PBL form was used to record the data of subjects which was analysed using the statistical package for Social science (SPSS) version 11.

The duties of the survey team members are described as follows:

Ophthalmologists:

Supervision of the entire project
Education of other team members on the significance of the study
Training of other team members on their specific roles
Assessment of visual acuity in young uncooperative children
Perform basic and special eye examination on patients with VA <6/18, measure intraocular pressure of those with cupped discs with Perkin's applanation tonometer
Complete parts D, E, F, G, of the WHO /PBL eye examination record
Determine the cause of visual loss in all those with visual acuity < 6/18
Treat and refer patients
Collection, collation and analysis of data.

Ophthalmic nurse:

Dilate patients' pupils with mydriatics
Perform basic eye examination on all those with visual acuity > 6/18
Complete part C of the WHO /PBL form

Community Health Extension Worker CHEW:

Identification of compounds and households
Measurement of visual acuity
Completion of part B of the WHO / PBL eye examination record.

Local Helpers (two per village):

General organization of subjects
Mobilization of the people and information dissemination about the survey
Run errands for survey team
Registration of subjects and completion of part A of WHO / PBL form.

RESULTS

A total of 1513 subjects were examined giving a good coverage of 99.4%. Males accounted for 754 while females were 759 giving a male/female ratio approximately 1:1. As shown in table1, subjects less than 20years old were 476 accounting for 31.5% while those between 20years and 39years accounted for 27.8% others were 40 years to 59years accounting for 16.4%; 60 years to 79 years accounting for 12.5%. Those 80years and above were only 28 in the study accounting for 1.8%.

Nineteen persons were bilaterally blind giving a prevalence of 1.26%. All those blind were 50years and above and distributed as follows: 50-59 years had 2 blind with ASP(age specific prevalence) of 1.09%, 60-69years 5(4.09%), 70- 79 years had 8 blind with ASP of 11.94%, 80 years and above had 4 blind with ASP of 14.29% (table 1). There were 26

Table 1: Age Specific Prevalence of Blindness

S/n	Age Group (yrs)	Number Examined (%)	Bilateral Blindness no. and ASP*	Unilateral Blindness no. and ASP
1.	0-9	251 (16.6)	0(0)	1(0.39%) 1 (0.44%)
2.	10-19	225 (14.9%)	0 (0)	2 (0.99%)
3.	20-29	202 (13.4%)	0 (0)	0 (0%)
4.	30-39	218 (14.4%)	0 (0)	3 (1.38%) 5 (2.73%)
5.	40-49	217 (14.3%)	0 (0)	6 (4.92%) 5 (7.46%)
6.	50-59	183 (12.1%)	2 (1.09%)	3 (10.71%)
7.	60-69	122 (8.1%)	5 (4.09%)	
8.	70-79	67 (4.4%)	8 (11.94%)	
9.	80 and above	28 (1.8%)	4 (14.29%	
	Total	**1513 (100%)**	**19 (1.26%)**	**26 (1.72%)**

unilaterally blind persons most of whom were above 50years old as shown in the table.
The pattern above shows age as a risk factor for blindness as no subject below 50years was found to be blind and those above 80years had the highest age specific prevalence of blindness of 14.29%, followed by 70- 79 years (11.94%), 60 69 years (4.09%) and 50- 59 years (1.09%).

More females were found blind, accounting for 13 out of the 19 blind. This gives a sex specific prevalence of 0.79% for males and 1.71% for females (table 2)

On the other hand, more males were found to be unilaterally blind accounting for 14 out of the 26 unilaterally blind with a

Table 2: Sex distribution of blindness

S/n	Sex	No Examined	Bilateral Blindness no.(SSP*)	Unilateral Blindness no. (SSP)
1	Male	754	6 (0.79%)	14 (1.86%)
2	Female	759	13 (1.71%)	12 (1.71%)
	Total	**1513**	**19**	**26**

SSP* = sex specific prevalence

sex specific prevalence of 1.86% while female accounted for 12 with a sex specific prevalence of 1.71%.

DISCUSSION

Subjects less than 20years old formed most of the total sample population accounting for 31.5%. This conforms to the trend in developing countries[4] and other parts of the country[5] where similar studies were carried out. Fifty percent or more of the survey population was found to be less than 40 years. Subjects above 50years old accounted for only 26.4% and this is the group where all the blind were found. The number of subjects reduced as their ages increased as shown in table 1. Those less than 9 years were 251 while those above 80 years were only 28. The subjects above 80 years, though few, contributed to 4 of the blind giving an age specific prevalence of 14.29%. This was the highest followed by those between 70-79 years with age specific prevalence of blindness of 11.94%. This high age specific prevalence of blindness in these age groups is expected since the commonest causes of blindness in our environment are cataract[6] and glaucoma[7] which are commoner in the older age groups[8]. This agrees with the global distribution of blindness by age[9, 10]. Blindness should, therefore, be expected to increase as life expectancy increases. Blindness control programs for the local government area should therefore, target the elderly.

Though both sexes were equally represented in the study, there were more bilaterally blind females[11]. This could be due to the restrictions placed on females from seeking medical help. This is contrary to the findings of some studies in Nigeria[12,13]. Males contributed only 6 out of the 19 who were bilaterally blind giving a male/female ratio of approximately 1:2 but contributed more of the number of unilaterally blind[14-16]. This is because most of the unilaterally blindness were caused by trauma and males are more exposed to trauma than women.

In conclusion, eye care programs should target the vulnerable groups which are the elderly and females. This should include health education aimed at highlighting the risk factors to blindness and ways of preventing blindness.

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