



Ocular Morbidity Pattern and Presentation among Residence of a Semi-Urban Community in Rivers State, Nigeria

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Authors' contributions

This work was carried out in collaboration among all authors. Author NEC designed the study and wrote the protocol. Authors NEC and EIE wrote the first draft of the manuscript. Authors NEC, VKO and EIE managed the literature searches. Author FEA performed the statistical analysis and managed the analyses of the study. All authors read and approved the final manuscript.

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ABSTRACT

Background: Ocular diseases vary in different parts of the world and are influenced by racial, geographic, socioeconomic and cultural factors. The common ocular diseases worldwide are cataract, glaucoma, conjunctivitis, corneal ulcers, uveitis, refractive errors, pterygium.

Methods: This was a community-based cross-sectional descriptive study carried out in Rumuokwuta community in Rivers state. Socio-demographic and clinical presentation information was obtained from an interviewer-administered questionnaire. Distant visual acuity was assessed at 6 m with the Snellen's chart while near vision assessment was at 33 cm with a Sussex vision R near vision chart. External eye examination was with pen touch while fundoscopy was with direct Ophthalmoscope. Data were analyzed with the Statistical Package for Social Sciences (SPSS) v20. Using descriptive statistics, categorical variables were presented in the form of frequencies and percentages (%) and summary statistics in means and standard deviations (SD). Using inferential

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statistics, the Chi-Square (X²) test of significance was used to associate categorical variables and a p-value ≤ 0.05 was considered statistically significant.

Results: A total of 114 subjects were examined. The mean age was 41.41 ± 15.49 years. The male to female ratio was 2:3. About 70.5% and 76.2% respectively in Right Eye and Left Eye had normal vision better than 6/18, while 27.1% and 21.9% respectively in Right Eye and Left Eye had a low vision (VA between 6/18 and 6/60). About 2.6% in either eye were blind. The three most common ocular conditions were Glaucoma (13.95%), Refractive error (13.02%) and Presbyopia (12.56%).

Conclusion: The commonest cause of Ocular morbidity in this study are glaucoma, refractive error and presbyopia. The age distribution of a study area was a significantly associated factor in the frequency of visual impairment and blindness.

Keywords: Morbidity; pattern; presentation; ocular; community.

1. INTRODUCTION

Morbidity refers to having a disease or a symptom of disease, or to the amount of disease within a population. Prevalence is a measure often used to determine the level of morbidity in a population. Ocular morbidity, therefore, refers to having an ocular disease or a symptom of ocular disease, or to the amount of ocular disease(s) within a population.

Pattern refers to the occurrence of health-related events (e.g. disease) by time, place, and person. Time patterns may be annual, seasonal, weekly, daily, hourly, weekday versus weekend or any other breakdown of time that may influence disease or injury occurrence. Place patterns include geographic variation, urban/rural differences, and location of work sites or schools. Personal characteristics include demographic factors that may be related to the risk of illness, injury, or disability such as age, sex, marital status, and socioeconomic status, as well as behaviors and environmental exposures.

The pattern of ocular diseases vary in different parts of the world and is influenced by racial, geographic, socioeconomic and cultural factors [1-4]. The prevalence of blindness and visual impairment among those 40 years and above in Nigeria were 4.2% and 1.5% respectively in the National survey conducted in Nigeria [5]. This prevalence varied across the geo-political zones of the country with the highest for blindness recorded in the North East (6.1%) and the lowest in the South West zone (2.8%) of the country [5].

Globally, the common ocular diseases are cataract, glaucoma, conjunctivitis, corneal ulcers, uveitis, refractive errors, pterygium. Other eye diseases include trachoma, onchocerciasis, xerophthalmia and ocular malignancies [3-4,6].

In a study on the prevalence and Causes of Ocular Morbidity in Mbeere district in Kenya, it was found that the leading cause was presbyopia which affected 25.11% (95% CI 22.05–28.45) of participants over 35 and increased with age [7]. Other leading causes of ocular morbidity were conditions that affected the lens (32.58%) and the conjunctiva (31.31%). No association was found between educational attainment or employment and ocular morbidity [7]. Edema et al. [1] from Benin City reported refractive errors, conjunctivitis, cataract and glaucoma to be the common eye diseases seen in Benin.

In a similar study Chukwuka, et al. [8] at Abonnema Rivers state, it was found that 74.7% of the subjects had normal vision, 11.6% had mild visual impairment, 0.48% had severe visual impairment while 13.1% was blind. The commonest cause of visual impairment in this study was refractive error. In another study Chukwuka, et al. [9] at Igwurita in the same Rivers state Chukwuka and Chinawa however found that among the subjects, 68.1% had normal vision, 15% had low vision, while 16.7% were blind. Refractive error was the most frequent eye disorder encountered (45.5%), followed by allergic conjunctivitis (14.8), cataract (10.9%), glaucoma (8.9%) and pterygium (3.9%). Bilateral blindness was observed in 4.5% of them with cataract being responsible for 29% of the blindness.

Globally, about 80% of blindness is avoidable (preventable or treatable) and most of the world's blind live in developing countries such as Nigeria [10]. Poverty and ignorance have been reported as factors responsible for many cases of avoidable blindness [11].

2. METHODOLOGY

This was a community-based cross-sectional descriptive study carried out in Rumuokwuta

community in Rivers state during a two-day outreach in conjunction with the assemblies of God church between 11th and 2th November, 2019. Socio-demographic and clinical presentation information was obtained from an interviewer-administered questionnaire. Distant visual acuity was assessed at 6 m with the Snellen's chart while near vision assessment was at 33 cm with a Sussex vision R near vision chart. External eye examination was with pen touch while fundoscopy was with direct Ophthalmoscope. Those requiring refraction had retinoscopic refraction while presyopic corrections were also given. Subjects requiring further evaluation were referred to a tertiary hospital.

Data were extracted from the questionnaires into Microsoft Excel ® version 2010 where it was coded and cleaned, and then imported into the "Statistical Package for Social Sciences (SPSS) v20 for data analysis." Using descriptive statistics, categorical variables were presented in the form of frequencies and percentages (%) and summary statistics in means and standard deviations (SD). Using inferential statistics, the Chi-Square (X²) test of significance was used to associate categorical variables and a p-value ≤ 0.05 was considered statistically significant.

3. RESULTS

The commonest age group was among those aged between 40-49 years (3.19%). The mean age was 41.41± 15.49 years while the male to female ratio was 2:3 as seen in Table 1.

Table 1. Socio-demographic Characteristics

Characteristics	Frequency n=115	Percentage (%)
Age (n=106)		
≤19	13	12.26
20-29	8	7.55
30-39	19	17.92
40-49	32	30.19
50-59	22	20.75
≥60	12	11.32
Mean	41.41±15.49	years
Sex (n=114)		
Male	45	39.47
Female	69	60.53

About 70.5% and 76.2% respectively in right eye (RE) and left eye (LE) had normal vision better than 6/18, while 27.1% and 21.9% respectively in RE and LE had a low vision (VA between 6/18

and 6/60). About 2.6% in either eye was blind as seen in Table 2.

Table 2. Visual Acuity (VA)

Characteristics	Frequency n=115	Percentage (%)
VA RE (n=114)		
6//4	1	0.88
6//5	20	17.54
6//6	14	12.28
6//9	38	33.33
6//12	7	6.14
6//18	11	9.65
6//24	6	5.26
6//36	4	3.51
6//60	10	8.77
HM	2	1.75
LP	1	0.88
VA LE		
6//4	1	0.87
6//5	16	13.91
6//6	18	15.65
6//9	37	32.17
6//12	15	13.04
6//18	8	6.96
6//24	3	2.61
6//36	6	5.22
6//60	8	6.96
HM	1	0.87
LP	1	0.87
NLP	1	0.87

*HM = Hand movement; LP = Light perception; NLP= No Light perception

About forty-three (43%) of subjects had normal vertical cup disc ratio (VCDR) ≤ 0.3 while more than 12% and 10% respectively in the RE and LE have VCDR more than 0.7 as seen in Table 3.

The three most common ocular conditions were Glaucoma (13.95%), Refractive error (13.02%) and Presbyopia(12.56%) as seen in Table 4.

The commonest presbyopic correction power was 2. 25D (17.78%), followed by 1.5D and 2D(15.56%).

Tables 5 and 6 showed a statistically significant association between age and visual acuity. Mean age was statistically significantly higher in participants that are blind, compared to normal or even the visually impaired (63.50 years vs. 42.38 & 36.25 years)(p=0.03) as shown in Table 5. Also, participants that are 40 years and above had a statistically significant higher proportion of been visually impaired compared to those that are younger (53.85% vs. 30.77% & 15.38%) (p=0.03) as shown in Table 6.

Table 3. Vertical Cup Disc Ratio (VCDR)

Characteristics	Frequency n=115	Percentage (%)
VCDR RE (n=98)		
0.2	3	3.06
0.3	40	40.82
0.4	25	25.51
0.5	10	10.20
0.6	8	8.16
0.7	6	6.12
0.8	4	4.08
0.9	1	1.02
0.95	1	1.02
Mean	0.43 ± 0.16	
VCDR LE (n=95)		
0.2	3	3.16
0.3	38	40.00
0.4	24	25.26
0.5	9	9.47
0.6	11	11.58
0.7	5	5.26
0.8	3	3.16
0.9	1	1.05
0.95	1	1.05
Mean	0.43 ± 0.16	

Table 4. Diagnosis

Characteristics	Frequency n=115	Percentage (%)
Diagnosis (n=215) (Both eyes combined)		
Glaucoma	30	13.95
Refractive error	28	13.02
Presbyopia	27	12.56
Allergy	21	9.77
Glaucoma suspect	20	9.30
Cataract	14	6.51
Presbyopia/allergy	12	5.58
Prsesbyopia/allergy	9	4.19
Refractive error/allergy	7	3.26
Bacterial conjunctivitis	6	2.79
Pterygium	5	2.33
Allergy/dry eye disease	4	1.86
Glaucoma/allergy	4	1.86
Presbyopia/dry eye disease	3	1.40
Aphakia	2	0.93
Age-related maculopathy	2	0.93
Dry eye disease	2	0.93
Glaucoma/cataract	2	0.93
Refractive error/dry eye disease	2	0.93
Glaucoma/squint	1	0.47
Maculopathy	2	0.93
Nld obstruction	2	0.93
Pathological moypia	2	0.93
Stable	2	0.93
Phthisis	1	0.47
Pingueculum	1	0.47
Ppres/dry eye disease	1	0.47
Prosthesis	1	0.47
Pseudophakia	1	0.47
Squint	1	0.47

Table 5. Association between mean age and categories of visual acuity of best eye

VA category for best eye	Age Mean \pm SD	ANOVA (p-value)
Normal ($\leq 6/12$)	42.38 \pm 13.40	3.64 (0.03)*
Visual Impairment (6/18-6/60)	36.35 \pm 20.14	
Blindness ($>6/60$)	63.50 \pm 4.95	

*Statistically significant ($p < 0.05$)**Table 6. Association between categories of age and Visual Acuity of best eye**

Age (years)	Visual acuity for best eye		Total	df	χ^2 (p-value)
	Visual Impairment	Normal			
	Freq (%) n=26	Freq (%) n=80			
≤ 25	8 (30.77)	8 (10.0)	16 (15.09)	2	6.801 (0.03)*
26-39	4 (15.38)	20 (25.0)	24 (22.64)		
40 or more	14 (53.85)	52 (65.0)	66 (62.26)		

*Statistically significant ($p < 0.05$)

4. DISCUSSION

In this study, about 70.5% and 76.2% in Right Eye and Left Eye respectively had normal vision better than 6/18. This was similar to the findings in neighbouring communities, at Abonnema [8] and Igwurita [9] in Rivers state, where 74.7% and 68.1% of the subjects had normal vision. The high percentage of subjects with normal vision could be because the study population as relatively young with a mean age of 41.41 \pm 15.49 bearing in mind that age is a risk factor for most common ocular diseases [12]. Age was also seen to be statistically significant factor associated with visual impairment and blindness. Furthermore, the study area is located in a suburban that had hosted similar medical outreaches where potentially visually-threatening conditions could have been diagnosed and managed early. This high percentage of subjects with normal vision could also be due to the high ratio of female to male as females had been known to have better health-seeking behavior [13-15] especially where there are no cultural barriers.

The commonest ocular morbidity was Glaucoma, Refractive error, and presbyopia. These are among common ocular findings globally [3,4,6]. These were also close to the findings of Edema et al. [1] from Benin City Nigeria who reported refractive errors, conjunctivitis, cataract, and glaucoma to be the common eye diseases seen in Benin. In Mbeere Kenya, the commonest cause of Ocular morbidity was presbyopia [7]. These findings could be because the commonest age group was 40-49 while the mean age was 41.41 \pm 15.49 years and age is a risk factor in the development of both glaucoma and presbyopia.

Glaucoma is the leading cause of irreversible blindness in West Africa and it has been estimated that 20% of people older than age 40 in West Africa may be at risk from the disease [16]. Glaucoma was the commonest cause of blindness in the study by Mahmoud et al. [2], and the second cause of blindness in Nigeria [5]. It was also found to be a common disease in other studies from Nigeria and Nepal [1,3,6,17].

Uncorrected refractive error which was one of the common cause of ocular morbidity in this study has been reported as the commonest cause of ocular morbidity in many studies [1,6]. It was the commonest cause of mild and moderate visual impairment in the Nigerian national blindness and visual impairment survey accounting for 77.9% and 57.1% respectively [5].

Cataract was not common in this study constituting only 6.1%. This could also be related to the fact that the mean age of the subjects was less than the approximate age of commencement of senile cataract which is the commonest cause of cataract. Age also reduces the chances of systemic disease like diabetes which increases the risk of cataract. Furthermore, the study area had had relative peace following amnesty granted to militants so there were fewer chances of riot, assaults, etc which could predispose to traumatic cataract.

In this study, about 2.6% in either eye was blind. This was quite low compared to the higher percentage of blindness seen in the rural communities of Abonnema and Igwurita of the same state which respectively recorded 13.1% and 16.7% blindness. This could be because our

study area was a sub-urban with better chances of health-based awareness and economic empowerment compared to rural communities since Poverty and ignorance have been reported as factors responsible for many cases of avoidable blindness [11]. In this study, participants 40 years and above were more likely to be visually impaired while those aged above 60 years were more likely to be blind. This finding reaffirms the assertion that the tendency of ocular diseases and visual impairment to occur increases at around 40 years of age, with a steep increase after the age of 60 years [18,19]. According to projections, by 2050, 80% of the elderly population will be living in low and middle-income countries [20]. Eye health care targeted at people 40 years and above should, therefore, be a priority in the coming years especially in low and middle-income countries, in order to mitigate against an epidemic of visual impairment and blindness in the near future.

5. CONCLUSION

The commonest cause of Ocular morbidity in this study are glaucoma, refractive error, and presbyopia. The age distribution of a study area was a significantly associated factor in the frequency of visual impairment and blindness.

6. LIMITATION

Perimetry was not done on site although those with Glaucoma or Glaucoma suspects were referred to a tertiary center for further evaluation.

CONSENT

It is not applicable.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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