Prevalence and Causes of Ocular Morbidities among Public Secondary School Students in Enugu-East Local Government Area, Enugu State, Nigeria

ABSTRACT

Background: Good vision is very important for people of all age groups particularly children.

Aim: This study was aimed to determine the prevalence and causes of ocular morbiditiesamong public secondary school students in Enugu-East local Government Area (L.G.A) of Enugu state.

Methods: A descriptive cross-sectional study was carried out among students attending public secondary schools in Enugu-East L.G.A. Nine hundred and fifty students were selected using multi-staged sampling technique. An interviewer-administered structured questionnaire was used to obtain the sociodemographic data, clinical history of the students as well as document their ocular examination findings. Their visual acuity, anterior and posterior segments were examined.They were also assessed for colour vision.

Result: A total of 950 students (361 males, 589 females) were interviewed and examined. The age mean age of the study participants was 14.2 ± 1.9 years. Only 4 (0.4%) students had eye screening at school entrance and none of these 4 students was tested for colour vision. Approximately 96.7% of the students had normal or near normal visual acuity.The overall prevalence of ocular morbidity was 9.2% (95% confidence interval (CI) = 7.3 – 11.2).The most prevalent ocular morbidity was uncorrected refractive error with a prevalence of 5.3%, followed by colour vision defect (1.2%) and suspicious glaucomatous disc (1.1%) with the least being bacterial conjunctivitis, conjunctival naevus, corneal opacity and pseudophakia (each 0.1%).

Conclusion: Secondary school students in Enugu-East L.G.A of Enugu state had some ocular morbidities. Therefore, early detection and appropriate treatment is important for the affected students to maximize their academic potentials.

Keywords: *Ocular morbidity, Prevalence, Causes, Secondary school students.*

ABSTRACT

Comment [U1]: could you consider this opinion

Good vision is very important for people of all ages, especially children. This study aimed to determine the prevalence and causes of ocular morbidities among public high school students in Enugu-East Local Government Area (L.G.A) of Enugu State. The method used was a cross-sectional descriptive study and for this 950 students were selected using the multistage sampling technique, a structured questionnaire administered by an interviewer was used to obtain sociodemographic data, the medical history of the students and document the findings of the study. eye exam. Their visual acuity, anterior and posterior segments of the eyeball were examined, as well as evaluated for color vision perception. Obtaining the following results from a total of 950 students (361 men, 589 women) who were interviewed and examined, the mean age of the participants was 14.2 ± 1.9 years and only 4 (0.4%) students underwent an eye exam upon entering school, but none of these 4 had a color test. Approximately 96.7% of the students had normal or near normal visual acuity. The overall prevalence of ocular morbidity was 9.2% (95% confidence interval (CI) = 7.3 – 11.2). The most prevalent ocular morbidity was uncorrected refractive error with a prevalence of 5.3%, followed by color vision defect (1.2%) and suspected glaucomatous disc (1.1%), with conjunctivitis being the least prevalent. bacterial,

conjunctival nevus, corneal opacity and pseudophakia (each 0.1%). With these data it is concluded that High school students in Enugu-East L.G.A of Enugu State had some ocular morbidities. Therefore, early detection and proper treatment are important for affected students to maximize their academic potential.

Keywords: Ocular morbidity, Prevalence, refractive error, High school students.

Introduction

Vision is very important to people of all ages but in particular children and adolescents because it plays a key role in their mental, physical and psychological development.[1] School children comprise a particular vulnerable group for ocular morbidities which may have detrimental effect on their academic performance, social and later in life their functional potential.[1]

Most schools do not do school entrance eye screening and even among the few that do, colour vision test is not usually done.Occupations relying on colour arenow on the increase because tasks are becoming more complex due to emerging technologies.[2]Therefore, this study was aimed at determining the prevalence and causes of ocular morbidities among secondary school students in Enugu-East Local Government area in Enugu State. Findings from this study may help to make recommendations on the importance of eye screening including colour vision test as part of school entrance medical fitness examination.

Subjects and Methods

This study was a descriptive cross-sectional study among public secondary school students in Enugu-East Local Government Area (L.G.A) of Enugu state between September and December 2017. In the course of the study, the tenets of the Helsinki declaration and the National code of Health research was adhered to. Ethical approval was obtained from the Enugu State University of Science and Technology Teaching hospital Health Research and Ethics Committee before commencement of the study. Approval for the study was also obtained from the Enugu State Post Primary School Management Board. From the statistics obtained from Enugu State Post Primary School Management Board, there were ten registered public secondary schools in Enugu-East L.G.A. The student's population ranged from 287 to 3524 students per school with a total student population of about 13,881.

A total of 950 students were selected by multi-staged sampling technique. In stage one, the sample size was proportionately allotted to the 10 public secondary schools in Enugu-East L.G.A depending on the population of each school. In stage two, the sample size for each school was proportionately allotted to its 6 levels depending on the population of each level. In stage three, the sample size for each level in the 10 schools was proportionately allotted to the different classes depending on the population of each class. In stage four, the students were selected from each class using simple random sampling by balloting. The list of students in each class as recorded in the register was used as the sampling frame.

Informed verbal consent was obtained from the schools' principals and written informed consent was obtained from the parents/guardian of each selected student. Verbal consent was obtained from each student before enrolment into the study. Students who do not give consent or whose parents did not consent to the study were excluded from the study.

A structured interviewer-administered questionnaire divided into 3 sections was used for the data collection. Section A consisted of the demographic data. Section B was used to obtain clinical history from the students while Section C was used to document the ocular examination findings.

The unaided distant visual acuity was assessed separately for each eye using Snellen's chart placed 6 meters away from the student. For students with a reduction in visual acuity in any eye, a pinhole visual acuity was done, occluding the fellow eye. For students using spectacle, visual acuity was also be assessed with the spectacles.

Battery-powered pen torch was used to examine the ocular adnexae, ocular alignment and motility, anterior segment and pupillary reaction. Fundoscopy was done using a direct ophthalmoscope.The students were tested for colour vision using Ishihara 38 plate chart 2011 edition and Farnsworth D-15 plate.

DATA ANALYSIS

Data obtained was analysed using the Statistical Package for Social Science (SPSS) version 20. The demographics, clinical history and prevalence of ocular morbidities were summarized using proportions and percentages while quantitative variables were summarized using mean and standard deviation. They were presented in frequency tables. The level of significance was set at p-value <0.05.

RESULTS

Table 1: Socio demographic data of the selected students

Characteristics	Frequency (%)	Mean (S.D)

	Sex		Total	
	Male	**Female**		
Age				
10-12	92(25.5)	123(20.9)	215 (22.6)	
13-15	177(49.0)	300(50.9)	477 (50.2)	14.2 (1.9)
16-18	89(24.7)	163(27.7)	252 (26.6)	
19-21	3(0.8)	3(0.5)	6 (0.6)	
Total	361(100.0)	589(100.0)	**950 (100.0)**	
Class				
JSS 1	76(21.1)	125(21.2)	201 (21.2)	
JSS 2	76(21.1)	123(20.9)	199 (20.9)	
JSS3	63(17.5)	121(20.5)	184 (19.4)	
SSS1	69(19.1)	97(16.5)	166 (17.5)	
SSS 2	52(14.4)	85(14.4)	137 (14.4)	
SSS3	25(6.9)	38(6.5)	63 (6.6)	
Total	**361(100.0)**	**589(100.0)**	**950 (100.0)**	
Religion				
Christianity	359(99.4)	588(99.8)	947(99.7)	
Muslim	2(0.6)	1(0.2)	3(0.3)	
Total	**361(100.0)**	**589(100.0)**	950(100.0)	

Only 4 (0.4%) students had eye screening at school entrance and none of these 4 students was tested for colour vision. All the 950 (100%) students were not aware of their colour vision status. Thirty-four (3.6%) students had eye injury in the past.

Using the WHO classification, 96.7% of the students had normal or near normal visual acuity (Table 2).

Table 2: Presenting and Best Corrected Visual Acuity (by person) of the study participants

Visual Acuity category (By WHO)	Frequency (%)	
	PVA(person)	BCVA(person)
Normal/Near normal VA (≥6/12)	919 (96.7)	940 (99.0)
Mild or no Visual impairment (<6/12 - 6/18)	19 (2.0)	9 (0.9)
Moderate visual impairment (<6/18 - 6/60)	12 (1.3)	1 (0.1)
Severe visual impairment (<6/60 – 3/60)	0 (0.0)	0 (0.0)
Blind (<3/60)	0 (0.0)	0 (0.0)
Total	950 (100.0)	950 (100.0)

PVA = Presenting visual acuity; BCVA = Best corrected visual acuity, VA means Visual Acuity; VI means visual impairment; ≥ means better than or equal to; < means worse than; WHO means World Health Organization.

The overall prevalence of ocular morbidity was 9.2% (95% confidence interval (CI) = 7.3 – 11.2). The different causes of ocular morbidity as found are shown in Table 3.Out of the 11 (1.2%) students that were found to have colour vision defect, 9 were boys and 2 were girls, 6 (54.5%) were deutan and 5 (45.5%) were protan. No tritan defect was detected.

Table 3: Distribution of Ocular morbidity among selected students

Ocular morbidity	Frequency (%)
Uncorrected refractive error	50 (5.3)
Colour vision defect	11 (1.2)
Suspicious Glaucomatous Disc	10 (1.1)
Allergic Conjunctivitis	6 (0.6)
Stye	2 (0.2)
Chalazion	2 (0.2)
Ptosis	2 (0.2
Bacterial Conjunctivitis	1 (0.1)
Conjunctival Naevus	1 (0.1)
Corneal Opacity	1 (0.1)
Pseudophakia	1 (0.1)
Normal	863 (90.8)
Total	950 (100.0)

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Discussion

In this study, only four students (0.4%) said they had eye screening at the time of their school entrance out of which none was tested for colour vision. It could be due to non-availability of school eye health policy requiring every student to get his/her eyes examined at the time of school entrance. All the students that participated in this study were not aware of their colour vision status. This is in agreement with findings from previous studies[3-7]where almost all the study subjects did not know their colour vision status. This shows that the importance of good vision as well as good colour vision for school children is underestimated thus, eye screening at

the time of school entrance is being neglected. It is not supposed to be so because children need good vision to do well in school. Therefore, their eyes should be properly examined before they are admitted into schools and any abnormality detected should be appropriately treated so as to ensure optimal performance in school. Those found to have colour vision defect should be told of their condition and they should be properly counseled so as to be well guided in the choice of their future career.

Visual status of the study participants

Most of the study participants (98.7%) were found to have good vision (≥6/18). Out of the 950 students, 12 (1.3%) students had visual impairment (< 6/18-3/60) using the WHO classification. This is similar with the findings of Ajaiyeoba et al in South-West Nigeria where the prevalence of visual impairment was also 1.3%[8]. A study by Ubajaka et al in Nnewi, Anambra state which is in the same geopolitical location as the present study found a higher prevalence of visual impairment (8.2%)[9]. This higher figure recorded by Ubajaka et al could be attributed to the fact that visual acuity of 6/18 was classified as visual impairment unlike in the present study[9].

Ocular morbidity among the study participants

The prevalence of ocular morbidity including was 9.2%. This was higher than the prevalence (6.1%) found by Okoye et al in Anambra, South-East Nigeria[10]. However, some studies in other parts of the country reported higher prevalence: Ajaiyeoba et al South-West, Nigeria (15.5%)[8] and Abah et al in Zaria, Northern Nigeria (22.6%)[11]. The most prevalent ocular morbidity was uncorrected refractive error with a prevalence of 5.3%. This was similar to the findings of Abah et al in Zaria.[10] This shows that vision screening of school children could be useful in detecting

correctable causes of decreased vision especially refractive error. The second most prevalent ocular morbidity was colour vision defect (1.2%). In contrast, Abah et al found that allergic conjunctivitis was the second commonest ocular disorder[11] while Okoye et al[10] and Ajaiyeoba et al[8] found that the commonest ocular disorder was allergic conjunctivitis followed by refractive error. This could be because CVD was not even sought for in these studies.

CONCLUSION

Secondary school students in Enugu-East L.G.A of Enugu state had some ocular morbidities. Therefore, early detection and appropriate treatment is important for the affected students to maximize their academic potentials.

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