

# Vision Survey of the Nnamdi Azikiwe University Medical Students

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## ABSTRACT

**Aim:** To determine the ocular problems of 1<sup>st</sup>-year preclinical medical students at the Nnamdi Azikiwe University, Nnewi Campus, Nnewi, Nigeria. **Materials and Methods:** All registered 1<sup>st</sup>-year preclinical medical students were examined in October 2008. Ocular investigation included filling out self-administered questionnaire, visual acuity estimation, anterior segment examination, ophthalmoscopy, refraction, squint assessment, and measurement of accommodation amplitude. **Results:** One hundred and eight students including 80 (74.1%) males and 28 (25.9%) females (M: F = 3:1), age range was 16–30 years, median – 21 years, were examined. Fifty-two (48.2%) students had a positive family history of eye disease; 23 (21.3%) had symptoms of eye disease. Poor distance vision was the most common symptom; itching and poor near vision were uncommon. Of the 23 students with ocular symptoms, 18 (78.3%) had a positive family history of eye disease. Nine (8.3%) students had low vision. Ninety students (83.3%) had ocular problems, with 78 (63.0%) having ametropia (astigmatism, 72 [66.7%]; myopia, 5 [4.6%]; and hypermetropia, 1 [0.9%]), 2 (1.8%) latent strabismus, and 9 (8.3%) allergic conjunctivitis. One (0.9%) student had bilateral leukoma and dry eyes. The range of binocular amplitude of accommodation was 8.00–25.00 D with a median of 16.50 D. The mean accommodation amplitude was significantly higher than the population age norm ( $t = 5.739$ ;  $P = 0.0003$ ). **Conclusions:** Some fresh university students have ocular problems that could interfere with their academic work. Preregistration ocular examination is recommended to enable the detection and treatment of any ocular disease that may impede optimal academic pursuit.

**Keywords:** Eye disorders, medical students, Nigeria

## INTRODUCTION

Schooling is a serious business. At every level, educational activities in the school require a physically and mentally fit person to obtain optimal results. Schooling often entails bringing persons from diverse background together. Such situation involves living together in hostels and dormitories; staying together in classrooms and laboratories as well as participation in other communal activities including sports.

Most university undergraduates are either adolescents or young adults. A previous population-based study in Anambra state reported that some young adults had visual problems that impeded their economic and social independence.<sup>[1]</sup> Although one does not expect a high incidence or prevalence of visual impairment among students,<sup>[2,3]</sup> those with ocular problems need to be detected early and treated to ensure optimal academic work.

Apart from the inability of the physically and mentally challenged to cope and maximally benefit from some academic and extracurricular activities, there is also

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concern that any student harboring infection may be a source of spread of such contagion to colleagues and classmates. On the other hand, a student may develop illness which may be a direct hazard of the schooling although great care is usually taken to minimize such problems.

These concerns are essentially the reasons for the preregistration medical examination, including ocular examination, of students at all levels including entry into the university. This compulsory medical examination to ascertain the fitness of the student to embark on university education has been the practice at the Nnamdi Azikiwe University, Awka, and Nnewi Campuses. However, this time-honored requirement for fresh students was abandoned a few years ago coincident with the introduction of electronic registration of students via the internet.

However, there is a need to obtain rational scientific information that may support the need to continue or not with the compulsory medical examination. There is also need to determine the natural changes that may occur in the students during the course of schooling.

In an effort to bridge this information gap, we embarked on a longitudinal cohort study to determine the ocular problems and natural changes that may occur over time in the eyes of medical students at the Nnamdi Azikiwe University Nnewi Campus, Nnewi, Nigeria. The present report is on the baseline findings among 1<sup>st</sup>-year preclinical students.

## MATERIALS AND METHODS

All registered 1<sup>st</sup>-year preclinical medical students at the Nnamdi Azikiwe University, Nnewi Campus, Nnewi, Nigeria were examined in October 2008. Each student filled out a self-administered questionnaire on vital statistics (biodata), present and past ocular complaints, ocular treatment including the use of eyeglasses and family ocular history. Ocular investigation included visual acuity measurement with the Snellen chart at 6 m in ordinary daylight, anterior segment examination including testing the extraocular muscle movements with the penlight, direct ophthalmoscopy, refraction with the Potec auto-refractor (Potec, Korea) and measurement of accommodation amplitude with the gradient method. The corneal light reflection and the cover tests were used to examine for strabismus. Further, test for tear production, wetting of corneal surface, and tear break-up time were conducted on the student with extensive corneal pathology. In line with provisions of the International Classification of Diseases-10, low vision for this study was defined as presenting visual

acuity  $<6/18$  and blindness as acuity  $<3/60$ . Refractive error was defined as  $>0.5$  diopters (D) in the student's better eye. Statistical analysis was with the risk ratio and paired Student's *t*-test with the alpha level at 0.05.

## RESULTS

A total of 108 students made up of 80 (74.1%) males and 28 (25.9%) females (M: F = 3:1) were examined. The age range was 16–30 years; median – 21 years. Fifty-two (48.2%) students had a positive family history of eye disease; 23 (21.3%) had symptoms of eye disease. Some students had more than one symptom. Poor distance vision was the most common symptom. Itching and poor near vision were uncommon [Table 1]. Of the 23 students with ocular symptoms, 18 (78.3%) had positive family history of eye disease. According to these participants, at least one of the family members had similar. Eye disease symptoms were more likely to students with positive family history (risk ratio - 3.88). While no student was blind, 9 (8.3%) had low vision. Table 2 shows the presenting visual acuity in the better eyes of the students.

The clinical diagnosis is shown in Table 3. Ninety students (83.3%) were diagnosed with ocular problems, although as mentioned above, only 23 (21.3%) complained of ocular problems. Some students had more than one diagnosis. Refractive error was the most common diagnosis occurring in the 78 (63.0%) of the students. The bilateral dense corneal opacity caused visual impairment in the affected student. While the degree of ametropia varied between the 2 eyes, in no

**Table 1: Ocular complaints**

Symptom	n (%)*
Poor distance vision	17 (73.9)
Tearing	3 (13.0)
Grittiness	2 (8.7)
Eye strain	2 (8.7)
Redness	2 (8.7)
Swollen lids	1 (4.4)
Itching	1 (4.4)
Poor near vision	1 (4.4)

\*Based on 23 students

**Table 2: Presenting visual acuity (better eye)**

Visual acuity (snellen)	n (%)
6/6	87 (80.6)
6/9	8 (7.4)
6/12	4 (3.7)
6/24	1 (0.9)
6/36	6 (5.6)
6/60	2 (1.8)
Total	108 (100.0)

student was the difference more than 1.00 D. Thus, no significant anisometropia was recorded in the students. The 2 students with latent strabismus had hypermetropic astigmatism, but the refraction was the same in each eye.

Among students with ametropia, spherical errors were observed in 6 (5.6%), namely: Hypermetropia (+2.25 D), 1 (0.9%) and myopia (0.75–6.00 D), 5 (4.6%). Astigmatism was recorded in 72 (66.7%) students with 15 (24.6%) having hypermetropic astigmatism and 46 (75.4%) myopic astigmatism. Mixed or compound astigmatism was not recorded. The range of astigmatism was 0.75–4.50 D. Refraction was unrecordable in either eye of one student with bilateral cornea scar from previous chemical injury with visual acuity of 6/60 in each eye. (As a child this student was treated with harmful traditional eye medicine including ground pepper during an episode of febrile convulsions). Considering the extensive corneal pathology, it is likely that this student had irregular astigmatism. This student on further assessment also had poor tear production; poor wetting of corneal surface and short tear break-up time and was therefore taken as having dry eyes in addition to the aforementioned corneal pathology.

The range of binocular amplitude of accommodation was 8.00–25.00 D with a median of 16.50 D. Three students aged 20–22 years who had myopia of 1.25 D had the lowest accommodation amplitude (8.00 D), whereas 2 other students aged 19 years who were emmetropic had the highest amplitude of accommodation (25.00 D). However, as shown in Table 4, the mean accommodation amplitude in the students was significantly higher than the population age norm ( $t = 5.739$ ;  $P = 0.0003$ ).

## DISCUSSION

The results of this study suggest that some undergraduate medical students have eye problems that could interfere with their academic work. Nearly, 74% of the students with eye disease symptoms complained of poor distance vision. Indeed, ocular examination revealed that 19.4% had subnormal visual acuity (<6/6) and 8.3% had low vision (<6/18) in the better eye [Table 2]. The implication of these findings is that the affected students may not see clearly the blackboard or slide projection if they do not sit close to the board or slide screen. In a class of at least 108 students, only a few students will be able to occupy the front row.

A common cause of poor distance vision is ametropia. This was the most common diagnosis in the students, occurring in 63.0% [Table 3]. Refractive errors are common in Nigeria. Hospital-based studies in different

parts of Nigeria had reported varying incidences of 12.7–53%.<sup>[4-7]</sup> Studies have also shown that ametropia is common among school children in Nigeria.<sup>[8,9]</sup> While spherical errors (myopia and hypermetropia) were small, astigmatism constituted 66.7% of ametropia. This is similar to the findings in a previous study of refractive errors among students at the Guinness Eye Centre Onitsha.<sup>[8]</sup> For now, we have not found a convincing reason for the preponderance of astigmatism. Perhaps there may be a hereditary factor since participants in both studies are from the same ethnic group– the Igbo ethnic group.

Visual obscuration, eye strain, and asthenopia are ocular symptoms associated with ametropia and muscle imbalance. Two students with asthenopic symptoms had latent strabismus and refraction also revealed that they also had hypermetropic astigmatism. However, none of the students had manifest squint. The mean accommodation amplitude in the students was significantly higher than the population age norm.<sup>[10]</sup> Eye strain and poor distance vision, which up to 82.6% of the students complained about [Table 1], are more likely to be due to ametropia. If untreated the afflicted may develop phobia for close work including reading. However, ametropia is treatable with simple optical aids. Medical examination at school enrollment offers an excellent opportunity to detect and treat such ailments.

**Table 3: Clinical diagnosis**

Diagnosis	n (%)*
Ametropia	
Astigmatism - 72	78 (63.0)
Myopia - 5	
Hypermetropia - 1	
Allergic conjunctivitis	9 (8.3)
Latent strabismus	2 (1.8)
Leukoma	1 (0.9)
Dry eye	1 (0.9)

\*Based on 108 students; some students had more than one diagnosis

**Table 4: Mean binocular amplitude of accommodation of the students compared with the population age norm**

Age (years)	Population age norm (diopters)	The present study (diopters)
16	12.0±02.0	12.50±0.0
17	11.75±2.0	13.10±2.6
18	11.50±2.0	12.40±1.8
19	11.25±2.0	13.70±2.8
20	11.00±2.0	13.80±2.8
21	10.75±2.0	11.80±1.2
22	10.50±2.0	11.60±1.8
23	10.25±2.0	13.20±2.6
24	10.00±2.0	11.00±0.0
30	9.50±2.0	11.00±0.0

Paired two-tailed *t*-test: 5.739, df: 19,  $P = 0.0003$

Many eye diseases run in families. Therefore, it is not surprising that eye disease symptoms were more likely to students with positive family history. It is gratifying that no student was blind and none had ocular communicable disease. However, 9 (8.3%) had low vision and 2 (1.8%) had latent strabismus with asthenopic symptoms. These ocular disorders need to be properly treated to enable the students face their academic work with comfort. However, different treatment approaches are required for the different symptoms and diagnoses elicited in the students.

Twenty-three students had eye complaints but in all 90 of them were diagnosed with visual problems. The difference in number draws attention. But it is important to state that not all of these require very costly intervention. While students with refractive errors need simple optical aids to enable them get on smoothly with their studies, those with allergic symptoms require antiallergic medications. However, all the students including those without eye disease symptoms need regular eye health education.

## CONCLUSIONS

Eight out of the 9 (88.9%) students with low vision had improved distance vision with refraction. However, none of the 8 students was using any form of optical aid. These students required simple spectacle correction of their ametropia. The student with bilateral cornea scar from previous chemical injury also had evidence of dry eye. This student needs to be followed up more closely with frequent treatment of the dry eye symptoms and may also require low vision aid. In addition to optical aids, the students with latent strabismus will also benefit from orthoptic exercises. Relevant health education, including informing the students that some common eye diseases run in families, will help these students seek regular medical care that will enable them maintain optimal eye health during their studies. In conclusion, this baseline examination suggests that a good proportion of fresh

university students have ocular problems. Important lessons from this study include that (i) the number with eye conditions which could negatively impact on the students' academic performance is significant enough to necessitate a mandatory preregistration ocular examination in them; (ii) family history of eye disease is a significant risk factor for eye disease in the study population. Therefore, detailed preregistration ocular examination is recommended to enable the detection and treatment of any ocular disease that may impede optimal academic pursuit.

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## Conflicts of interest

There are no conflicts of interest.

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