

# PATTERN OF REFRACTIVE ERRORS AT OBAFEMI AWOLOWO UNIVERSITY TEACHING HOSPITAL, ILE-IFE, NIGERIA

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## SUMMARY

**Objective:** The objective of this paper is to determine the prevalence and pattern of cases of refractive error reported at the eye clinic of the Obafemi Awolowo University Teaching Hospital, Ile-Ife (OAUTH).

**Methodology:** All consecutive new patients seen at the eye clinic of the OAU Teaching Hospital, Ile-Ife, between October 1997 and September 1998 were examined. Those patients who complained of difficulty in seeing near or far objects, whose vision improved with the pinhole or those who had difficulty doing close work like reading or threading needles were refracted by the author.

**Results:** Out of the 1,550 new patients seen within the period of study, eight-hundred and sixty-eight (54.9%) had refractive errors. Refractive errors were twice as common among the females than the males in this study. Myopia was the commonest spherical error (22.7%). The highest degree was -12.0DS. Presbyopia was present in 31.8% of the patients. The youngest age of presentation for presbyopia was 36 years. Astigmatism occurred in 55.8% of the patients seen. Most of the patients (68.3%) had myopic astigmatism. One of the two patients who had anisometropia had developed amblyopia in the more hypermetropic eye.

**Conclusion:** Since refractive errors were found to be very common in this study increased health education and provision of adequate, affordable and modern facilities for correction of refractive errors are highly recommended.

**Key words:** refractive errors, myopia, hypermetropia, astigmatism, presbyopia, anisometropia, ametropia.

## INTRODUCTION

Decreased visual acuity, which is a cardinal sign of refractive error, is the commonest complaint among patients seen in the eye clinic of the OAU Teaching Hospital Complex, Ile-Ife.

Refractive errors are common causes of visual morbidity; these must be looked for in any patient complaining of inability to see clearly. Refractive errors are common amongst Nigerians. In a study conducted by Olurin<sup>1</sup> in Ibadan, prevalence of errors of refraction was found to be 20-22%. Also in Lagos, Adefule-Ositelu<sup>2</sup> discovered that error of refraction is the commonest visual problem among Nigerian adults. The different types of refractive errors are myopia, hypermetropia, presbyopia, astigmatism and anisometropia.

The prevalence of various types of refractive errors varies from place to place. In studies conducted at different centers in Zaire,<sup>8</sup> Israel<sup>3</sup> and Alaska<sup>4</sup>, myopia was found to be the commonest error of refraction. A study conducted in Hong Kong, however, found that hypermetropia was the predominant refractive error overall while myopia appeared to be more prevalent among the younger age groups.<sup>5</sup>

In two different studies conducted by Nwosu<sup>6</sup> at Onitsha and Nworah and Ezepeue<sup>7</sup> at Enugu, hypermetropia was the commonest spherical error. This was attributed to the role of the genetic factor in the determination of refractive errors.

In order to plan adequately for the control of blindness and visual handicap from a particular eye morbidity in a particular environment, it is necessary to collect data on the pattern of the disease. This will enable planners to provide for both the human and material resources required for appropriate and adequate eye care.

This study is therefore aimed at determining the pattern of refractive errors in patients presenting at the Obafemi Awolowo University Teaching Hospital, Ile-Ife,

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in order to provide useful advise for future blindness prevention programmes.

**PATIENTS AND METHODS**

A prospective study was conducted at the eye clinic of the ophthalmology unit of the Obafemi Awolowo University Teaching Hospital Complex, Ile-Ife. The eye clinic caters for the eye care needs of urban and rural dwellers in Osun, Ekiti, and Ondo states and part of Oyo State and a few people outside these areas.

All new patients who presented at the eye clinic between October 1997 and September 1998 formed the subject of this study.

A questionnaire was given to each of the patients after obtaining his/her informed consent. The questions were asked directly by the author and appropriate responses recorded.

Information on age, sex, visual/ocular and non visual or asthenopic symptoms, general health status and ophthalmic examination findings were recorded.

Visual acuity was tested with a Snellen's chart and near chart. Objective refraction was done as necessary and the final prescription after subjective refraction was used to classify the patients.

Intra-ocular pressure measurement was done with a Goldman applanation tonometer; funduscopy was done with a direct and an indirect ophthalmoscope (where necessary).

Patients were classified as having spherical or astigmatic errors. Patients whose spherical errors were less than 6 dioptres were classified as having low myopia or low hypermetropes.

Verification of the axis and power of the cylindrical corrections was done using a Jackson cross cylinder.

Those patients whose errors of refraction between the two eyes were different by more than 2 dioptres were classified as having anisometropia. All patients with simple and compound myopic astigmatism were classified as having myopic astigmatism while patients with simple or compound hypermetropic astigmatism were classified as having hypermetropic astigmatism.

The data obtained were recorded and analyzed using the SPSS computer software package. The results were as presented in tables 1-6.

**RESULTS**

Within the 12 month period, October 1997- September 1998; 1,580 new patients consisting of 882 males and 698 females were seen at the Ophthalmic Clinic of the Obafemi Awolowo University Teaching Hospital, Ile-Ife. Of these patients, 868 (54.9%) had refractive errors correctable to 6/9 visual acuity or better in both eyes (1736 eyes). There were 336 (38.6%) males and 532 (61.4%) females, a male to female ratio of 1:1.6. The youngest patient was a 5-year-old girl and the oldest

was an 83-year-old man. The mean age was 35.9 years for males and 29.5 years for females.

The prevalence of refractive errors in all the patients seen within the 12-month period was 38.1% in the male patients and 73.2% in the female patients. The largest number of patients (17.2%) were found in the female 11-20 years age group (table 1). The majority of the patients were students and civil servants (see table 2).

Table 3 shows that myopia was the commonest spherical error (22.7%). Of the 171 patients with hypermetropia, only 4 patients (2.3%) were found to have high hypermetropia (error greater than +6.0DS). The highest degree was +8.75DS. Five (2.5%) of the patients with myopia had high grade error (greater than -6.0DS); the highest degree was -12DS. Presbyopia was found in 276 patients

The types and degrees of spherical refractive errors are presented in table 4. Out of the 368 patients with spherical errors only 9 (2.5%) had refractive errors greater than 5.00 DS.

An examination of the distribution of astigmatism among ametropic patients showed that astigmatism occurred in 484 patients. Of these, 196 (40.5%) had myopic astigmatism, and 40 (8.3%) had hypermetropic astigmatism while 248 (51.2%) had mixed astigmatism.. Majority of the patients had small degrees of astigmatism. Of all the patients with astigmatism 96.3% were within 1 dioptre.

The age distribution of the presbyopic patients is shown in table 5. The youngest age of presentation for presbyopia in this study was 36 years. Majority (97.1%) of the patients with presbyopia presented after 40 years of age while only a few - 3 males (1.1%) and 5 females (1.8%) - presented before the age of 40 years.

**Table 1.** Age and sex distribution of patients with refractive errors

Age	Sex		Total
	No. of Males	No of Females	
0-10	5 (0.6)	11 (1.3)	16 (1.9)
11-20	28 (3.2)	149 (17.2)	177 (20.4)
21-30	109 (12.5)	131 (15.1)	240 (27.6)
31-40	47 (5.4)	61 (7.0)	108 (12.4)
41-50	55 (6.3)	73 (8.4)	128 (14.7)
51-60	32 (3.8)	44 (5.1)	76 (8.9)
61-70	30 (3.5)	31 (3.6)	61 (7.1)
71-80	22 (2.4)	21 (2.4)	43 (4.8)
>80	8 (0.9)	11 (1.3)	19 (2.2)
<b>Total</b>	<b>336 (38.6)</b>	<b>532 (61.4)</b>	<b>868 (100)</b>

**Table 2.** Occupation of the patients

Occupation	Sex		Total
	No. of Males	No. of Females	
Student	134	300	434
Civil Servant	43	130	173
Teacher	26	72	98
Pensioners	42	4	46
Traders	30	10	40
Artisans	24	3	27
Unemployed	15	-	15
Farmers	12	2	14
Housewife	-	11	11
Clergy	10	-	10
Total	336	532	868

**Table 3.** Age distribution of spherical refractive errors in 368 patients

Age	Refractive Errors		Total
	Myopia	Hypermetropia	
0-10	1	11	12
11-20	81	23	104
21-30	36	20	56
31-40	16	8	24
41-50	36	48	84
51-60	15	25	40
61-70	7	17	24
71-80	3	13	16
>80	2	6	8
Total	197	171	368

**Table 4.** Types and degrees of spherical errors

Dioptric Power	Hypermetropia	Myopia	Total
≤0.75	101	51	252
1.00-1.75	48	59	107
2.00-2.75	8	27	35
3.00-3.75	7	4	11
4.00-4.75	2	1	3
5.00-5.75	2	1	3
6.00 and above	2	1	6
Total	171	197	368

**Table 5.** Age distribution of presbyopia

Age	Females	Males	Total	%
35-39	3	5	7	3.3
40-44	77	47	124	39.2
45-49	30	44	74	28.0
50-54	17	15	32	16.3
55-59	17	21	38	14.2
Total	144	132	276	100.0

Only two patients had significant anisometropia. One of these patients had already developed amblyopia at the time of this study.

**DISCUSSION**

The results of this study revealed that refractive errors are common among ophthalmic patients presenting at the Obafemi Awolowo University Teaching Hospital. Previous studies in different parts of Nigeria have reported a high occurrence of refractive errors in other centres.<sup>1,2,6</sup>

In this study, myopia was more common (22.7%) than hypermetropia (19.7%), however myopia was still more common when astigmatic errors were included.

These findings are consistent with those of Olurin<sup>1</sup> and Adefule-Ositelu<sup>2</sup>, both of whom recorded a marked dominance of myopia among their patients.

This is contrary to the findings in the two different studies conducted by Nwosu<sup>6</sup> at Onitsha, and Nworah and Ezepue<sup>7</sup> at Enugu. Nwosu and Nworah found that hypermetropia was the predominant spherical error, but recorded an excess of myopia when patients with astigmatic and simple myopic errors were considered. Rosner and Belkin<sup>3</sup> found a dominance of myopia among other refractive errors during a survey conducted in Israel. Also, Kaimbo and Missotten<sup>8</sup> in Zaire documented a predominance of myopia in their study among Zairean blacks.

A study conducted in Hong Kong revealed an excess of hypermetropia in Chinese adults<sup>5</sup>. This was attributed to the role of genetics in the determination of refractive errors.

The role of genetics and race and their influence on the prevalence of refractive errors has been documented.<sup>9</sup> This could also account for the differences in the prevalence of ametropia in different reports by various researchers.<sup>10</sup> This study, like those of Olurin<sup>1</sup> and Adefule-Ositelu<sup>2</sup> was conducted among the Yoruba, the predominant ethnic group in the western part of Nigeria, while those by Nwosu,<sup>6</sup> and Nworah and Ezepue<sup>7</sup> were carried out among the Igbo ethnic group in the East.

Similar to the observations by Nwosu<sup>6</sup> and Olurin,<sup>1</sup> a shift of hypermetropic error with increasing age was also documented in this study. This was more marked especially in the fifth and sixth decades. High myopia was not very common among the patients in this study (2.5%). This low prevalence of high myopia compares with the findings of Adefule-Ositelu<sup>2</sup> who recorded a prevalence of 2.2%.

The group with the highest number of female patients was the 11-20 years age group, while more males were between 21-30 years; most girls between the ages of 14-19 years regard the wearing of glasses as the vogue, so they complained more and earlier than the boys of the same age group. Majority of the males were school leavers and students of higher institutions who were exposed to the stress of studying. This group accounted for a higher number of low grade myopia. This finding was consistent with those of previous studies in Nigeria.<sup>1,2,7</sup>

Astigmatism occurred in 484 patients (55.8%). More females (62.8%) had astigmatic errors than males. Majority of the patients - 62% females and 34.4% males - had their astigmatic errors within 1.00 dioptre cylinder. Most of the patients had myopic astigmatism as one should expect since myopia is the commonest refractive error. This is in agreement with the findings of a study conducted by Minonu Tanaka<sup>11</sup> in Tokyo, which reports that myopic astigmatism is more predominant than hypermetropic astigmatism.

As shown in the study, only two patients had anisometropia greater than 2.00 dioptres. One of them was a 10-year-old girl who had developed amblyopia in the more hypermetropic eye.

Majority of the patients (97.4%) had their vision corrected to at least 6/9 visual acuity. All the patients were in good health and had no other medical or surgical problems.

In view of the high frequency of refractive errors among students and civil servants, it is highly recommended that routine ophthalmic check-ups be encouraged among these groups so that the necessary correction is carried out promptly. This will enhance the visual performance of affected individuals.

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