Refractive errors in, Kaduna, Nigeria

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Abstract

Background: In the face of economic decline in Nigeria, budgetary subvention from government to health institutions has suffered adversely. Health institutions are forced to look inwards, minimize waste and generate resources to sustain the clinical services. One such area of clinical service is the optical area. To sustain this important service area, the need to identify the common refractive error and to commit the meager resources to the purchase of appropriate lens category became imperative.
Methods: Between February 2000 and February 2001, a prospective study on the pattern of refractive errors was carried out at the outpatient eye clinic of the Guinness Ophthalmic Unit, Kaduna. Every consecutive new patient with asthenopic symptoms or blurred vision for distant objects or for small prints was refracted.
Results: One thousand, eight hundred and forty one patients with asthenopic symptoms were refracted. Forty nine percent were males and fifty one percent females. The age range was 6-60 years. Low-grade hypermetropia (0.25D – 1.25D) was the commonest spherical error (21.7%) observed, while astigmatism was observed in 14.3%. Simple myopia constituted 8.0%. Presbyopic patients formed the largest group (56.0%)
Conclusion: Refractive error is a common cause of visual impairment among ophthalmic patients in Kaduna. Judicious management of the meager resources on appropriate lens category, which in this study is presbyopic lens type, cannot be overemphasized.

Key Words: Hypermetropia, myopia, astigmatism

Introduction

Significant visually disabling refractive error affects a large proportion of the world's population, affecting both gender and all age and ethnic groups. [1] Errors of refraction are the most common cause of visual impairment as observed in studies conducted in Nigeria and abroad. High prevalence rates were obtained in Hospital based studies carried out by Olurin in Ibadan, [2] Nworah and Ezepue in Enugu, [3] Adefule-Ositelu in Lagos, [4] Nwosu in Onitsha. [5] Few population studies on refractive errors have been carried out. Stenstom's study [6] in Uppsala, Sweden observed a prevalence of 29% for myopia, 7% had moderate myopia (2D to 6D), and

2.5% had myopia greater than 6D. The great majority of his population (just under 70%) was clustered between emmetropia and 2D of hyperopia, while the remaining small fraction consisted of high hyperopes and aphakes. Symptoms of refractive error often include blurring of vision and eyestrain. However, other ocular disorders may give rise to similar symptoms. [7]

Materials and Method

Between February 2000 and February 2001 a prospective study was carried out in the Guinness Ophthalmic Unit (GOU) outpatient eye clinic, Ahmadu Bello University Teaching Hospital, Kaduna, Nigeria. Every consecutive, new patient with asthenopic symptoms or poor vision for either distant objects of for small prints was refracted by the optometrist.

Objective refraction was carried out using the steak retinoscope, while subjective refraction was administered on all the patients. Some children and teenagers had cycloplegic refraction using guttae cyclopentolate.

Excluded from the study were infants and pre-school children refracted in the theatre as part of examination under anaesthesia (EUA). Also excluded were patients whose ocular pathology accounted for the symptoms presented. Biodata information on all the patients was documented.

Results

During the period of study fourteen thousand four hundred and eight six (14,486) patients were seen in the outpatient clinic. 12.7% (1,841) of these patients formed the subject of this study.

The age range was 6 –60 years, with 30% of patients in the age range 41 – 50 years as shown in table I. 48.7% (896) were males while females constituted 51.3% (945), with a male to female ratio of 0.9:1.1. Students and pupils constituted the largest group of patients (31.1%) refracted during the period of study. Farmers constituted 1.3% and the least refracted group of patients.

The main symptom complained of by the patients was blurring of vision for either near or distant objects or for both. Some patients had more than one symptom.

Tables II and III below show the type and degree of refractive errors encountered. Myopic astigmatism was present in 146 (55%) patients while hypermetropic astigmatism was present in 117 (44.5%). Myopic astigmatism was more evenly distributed in the entire spectrum while most of the hypermetropic astigmatism was 0.50 dioptre and below. Table IV below is a summary of the types of refractive errors seen in 1,841 patients.

Table 1: Age distribution of patients with refractive error

Age (years)	No. (%)
0 – 10	55 (3.0)
11 – 20	320 (17.4)
21 – 30	301 (16.4)
31 – 40	339 (18.4)
41 – 50	570 (30.9)
51 – 60	199 (10.8)
> 61	57 (3.1)
Total	1841 (100)

Table 2: Type and degree of refractive (spherical) errors

Dioptric power	Hyper-metropia	Myopia
	No. (%)	No. (%)
Plano – 0.50	251 (62.9)	40 (27.6)
0.75 – 1.25	111 (27.8)	35 (24.1)
1.50 - 2.00	9 (2.3)	26 (17.9)
2.25 – 2.75	8 (2.0)	6 (4.1)
> 3.00	20 (5.0)	38 (26.2)
Total	399 (100)	145 (100)

Table 3: Distribution and degree of astigmatism

Dioptric power (+cylinder)	Hyper-metropia	Myopia
	No. (%)	No. (%)
Plano – 0.50	104 (88.8)	44 (30.1)
0.75 – 1.25	9 (7.7)	41 (28.8)
1.50 - 2.00	3 (2.6)	38 (26.0)
2.25 – 2.75	0 (0)	6 (4.1)
> 3.00	1 (0.9)	16 (10.9)
Total	117 (100)	146 (100)

Table 4: Summary of types of refractive errors in 1,841 patients

Type of refractive error	No. (%)
Emmetropia / presbyopia	338 (18.3)
Hypermetropia / presbyopia	443 (24.0)
Myopia / presbyopia	49 (2.7)
Hypermetropic astigmatism / presbyopia	149 (8.0)
Myopic astigmatism/ presbyopia	55 3.0)
Hypermetropia	399 21.7)
Astigmatism	263 (14.3)
Myopia	148 (8.0)
Total	1841 (100)

Discussion

Almost 110 million individuals have some degree of low vision or visual impairment. [1] Refractive error being a major aetiology. Elimination or reduction of visual impairment due to refractive error can be achieved by refraction and the provision of appropriate optical device to the patient.

Hospital based studies on refractive errors have been carried out in different geographical location (Eastern, Western and the Lagos area) of Nigeria, however none has been carried out in this part of the country (Northern Nigeria) to the best of the author's knowledge.

The result of this study confirms that refractive error is a common cause of visual impairment among ophthalmic patients in Kaduna State.

Low-grade hypermetropia (0.25 – 1.25) was the commonest spherical error detected in this study. Nevertheless, a shift to hypermetropia with increasing age was observed, similar to the finding of Nwosu [5] in Onitsha. However in a study on refractive errors at the University Teaching Hospital eye clinic, Lagos, Nigeria, Adefule-Ositelu [4] found myopia to be more common. Similarly in another study at the University College Hospital eye clinic in Ibadan, Olurin [2] found myopia to be more common. The differences observed in the pattern of refractive errors in the different geographical zones may be due to racial and hereditary [7] factors. Environmental factors may also exert some influence.

Astigmatism of 0.25D to 1.25D was seen in 199 (76%) patients while astigmatism of greater than 3.0D was seen in 17 (6.5%) patients. Studies conducted in some developed countries indicate that about 15% of the adult population has astigmatism of over 1D and only 2% have astigmatism of greater 3D. [6] The apparent high percent of astigmatism of greater than 3D is not surprising because this study is hospital based and not a population based study. Nwosu [5] in Onitsha observed myopic astigmatism to be more common than hypermetropic astigmatism. The findings in the present report are similar.

Fifty six (56%) percent of all the patients refracted were presbyopic and needed presbyopic correction. Statistics from screening camps in rural Cambodia, also a developing nation, revealed that 57% of the patients with refractive errors require presbyopic correction. [8]

In conclusion, presbyopia was the commonest refractive error observed, followed by low degree of hypermetropia. Astigmatic error closely followed hypermetropia while myopia was the least error observed.

In conclusion, presbyopia was the commonest refractive error observed, followed by low degree of hypermetropia. Astigmatic error closely followed hypermetropia while myopia was the least error observed. To harness and prudently utilize the meager resources/subvention disbursed by the hospital management, the pattern of refractive errors in the eye clinic will served as a guide to the purchase of the appropriate lenses for use in the unit and so avoid wastage and the tying down of capital resources.

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