

PATTERN OF REFRACTIVE ERRORS AND PRESBYOPIA SEEN IN A PRIVATE EYE CLINIC IN PORT HARCOURT, NIGERIA.

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ABSTRACT

Refractive errors and presbyopia pose a challenge in the developing world in spite of the priority it attracts in vision 2020 programme. It can negatively affect the socio-economic life of an individual. Ignorance and poor mobilization of refractive services are the major contributors to this problem. The aim of this study is to determine the pattern of refractive errors and presbyopia in patients attending a private eye clinic in Port Harcourt as this will help to improve their management and education. The case files of patients with refractive error and presbyopia who presented at DDS Eye Centre and Surgery, Port Harcourt over a period of 6 years were studied. Their bio data and relevant medical and ocular history were reviewed. Their visual acuity and complete clinic evaluation were also reviewed including objective and subjective refractions done with appropriate techniques. A total of 700 patients with refractive errors and presbyopia were seen during the study period. Three hundred and sixty-eight (52.6%) were males and three hundred and thirty-two (47.4%) were females giving a M: F= 1.1:1. Eighty-eight (12.6%) were children 18 years old or less. Sixty six subjects (9.4%) of the study population had myopia, 35 (5%) had hypermetropia, 156 (22.3%) had astigmatism while 443 (63.3%) had presbyopia. Among the children, astigmatism was the highest form of refractive error (64.8%), while myopia constituted 27.3% and hypermetropia 7.9%. Astigmatism was the leading refractive error among children attending DDS Eye Centre and Surgery, Port Harcourt and it should be addressed by prescribing glasses and educating parents on the importance of acceptance and compliance with spectacle use to prevent amblyopia. The establishment of a vision screening programme for children of school age will also be of great benefit. Adults presented more with presbyopia than with refractive errors in the study. This should be treated so that it does not interfere with the daily activities of those affected.

Introduction

Refractive errors in eyes prevent light rays from forming a single focus on the retina and may be corrected with spectacles otherwise they may lead to poor progress in academics, poor performance at work and reduced socio economic satisfaction¹.

KEYWORDS: *Refractive Errors, Presbyopia, Private Eye Clinic*

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The problem of refractive error has remained difficult to curb in less developed economies probably because there are few eye-care personnel in the developing world and ignorance and there is also a problem of unequal distribution of these personnel and eye care facilities, with more being concentrated in the urban areas². Avoidable blindness including those due to uncorrected refractive error is one of the world's major ocular health problems and along with refractive error affects a large proportion of the population worldwide irrespective of age, sex and ethnic group³. It is a common cause of impaired vision and leading cause of treatable blindness in some parts of the world^{4,5}.

It is estimated that 0.8-2.3 billion people have errors of refraction worldwide⁶. In October 2006, the World Health Organization (WHO) released new global figures which reported that about 153 million people around the world are visually impaired from uncorrected refractive error⁷. Severe refractive error accounts for about 8 million blind people and about 90% of all people with uncorrected refractive error reside in low and middle-income countries^{5,7}. The report of the Nigeria National Blindness and Low vision Survey (2005-2007) showed that 61% of adults aged 40 years and above are visually impaired from uncorrected refractive error⁸.

In order to tackle the problems of avoidable blindness, the WHO in collaboration with the International Agency for the Prevention of Blindness (IAPB) and Non Governmental Organizations (NGOs) launched "Vision 2020: The Right to Sight" in 1998¹ with the sole objective of eliminating avoidable blindness by the year 2020. Uncorrected refractive error has been considered one of the priorities of the global initiative for the elimination of avoidable blindness^{9,10}. There are different types of refractive error which include myopia, hypermetropia and astigmatism¹¹⁻¹⁵.

Materials and Methods

All cases of refractive error and presbyopia presenting to DDS eye centre, Port Harcourt between August 2006 and November 2012 were reviewed. The patients' ages, sexes, occupation, relevant past medical and ocular history as well as family ocular history were recorded. A complete clinical evaluation including measurement of visual acuity at 6 metres, with Snellen's charts was carried out. Pictorial chart and Snellen's tumbling (illiterate) 'E'-chart were used to test the visual acuity of children between the ages of 4 and 6 years old while those less than 4 years

had their central fixation tested. Visual acuity was repeated with pinhole if it was less than 6/18. Standard ophthalmic examination was done for the anterior segment with a pen torch and slit lamp bio microscope. The posterior segment was examined with Welch Allen ophthalmoscope. Near vision was ascertained where appropriate. Their refraction was done objectively with Reiko ORK 11 Auto Ref-keratometer before the subjective refraction.

In all paediatric cases a cycloplegic objective refraction using 0.5% tropicamide and Welch Allen retinoscope was done followed by subjective refraction with trial lenses. Jackson's cross cylinder and duochrome tests were carried out and rounded off 2 weeks later with a post mydriatic refraction.

WORKING DEFINITIONS

1. In this study, Refractive Error was defined as presenting vision less than 6/6 and improved by one or more lines on the Snellen's chart when looking through the Pin-hole or the aid of a lens greater than 0.25D for adults or by cycloplegic objective refraction for children.

Emmetropia is when parallel rays of light strike a physiologically normal eye, they are refracted and converge on the photo-sensitive retina where they come to a focus forming a clear image of the object². When these ideal optical conditions occur with the eye at rest the condition is termed emmetropia. Emmetropia was taken to be the refractive correction of the eye between minus 0.25DS to plus 0.25DS.

Myopia (short-sightedness) is the form of refractive error wherein parallel rays of light come to a focus in front of the retina when the eye is at rest². The myopes have impaired distant vision and clear near vision. Myopia is diagnosed when the correction of the eye is more than minus 0.25DS.

Hypermetropia (long-sightedness) is when parallel rays of light are focused behind the photo-sensitive retina when the eye is at rest². Distant objects are thus seen clearer than near objects. Hypermetropia is diagnosed where the correction of the eye is more than plus 0.25DS. Astigmatism is the type of refractive error where the powers of the focusing elements of the eye are different in the different meridians². It may occur in addition to myopia or hypermetropia¹¹⁻¹³. For the purpose of comparison with other studies¹⁴⁻²⁰, astigmatic refractions were recorded as their spherical equivalent value.

Presbyopia was defined if both of the following were true: subjects were unable to read N6 optotype with distance correction and if they were able to read at least one more line with the addition of a plus lens.¹⁸

Visual impairment caused by uncorrected or inadequately corrected refractive errors is defined as visual acuity on presentation of

less than 6/18 in the better eye that could be improved to equal to or better than 6/18 by refraction or pin-hole¹⁹.

In order to make the data on visual impairment and blindness comparable worldwide and acceptable, the World Health Organization (WHO) Programme for Prevention of Blindness (PBL) recommended the definition of blindness as incorporated in the International Statistical Classification of Disease, and Related Health Problems, tenth revision (ICD-10)⁹. This defines blindness as visual acuity less than 3/60 or corresponding visual field less than 10° in the better eye with best possible correction (visual impairment categories 3, 4, and 5 in ICD-10); and low vision as visual acuity less than 6/18 but equal to or better than 3/60 in the better eye with the best correction (Visual Impairment Categories 1 and 2 in ICD-10). This will be used throughout this study.

The data obtained were analyzed using SPSS version 20.

RESULTS

Table 1: Age Distribution of Total Refractive Error and Presbyopia of Patients who attended DDS Eye Centre between August 2006 and November 2012.

	Myopia (%)	Hypermetropia (%)	Astigmatism(%)	Presbyopia(%)	Total (%)
Age					
0-9	6 (9.1)	1 (2.9)	11 (7.1)	-	18 (2.6)
10-18	18 (27.3)	6 (17.2)	46 (29.5)	-	70 (10)
19-29	22 (33.3)	12 (34.2)	53 (34.0)	-	87 (12.4)
30-39	14 (21.2)	10 (28.6)	45 (28.8)	48 (10.8)	117 (16.7)
40-49	3 (4.6)	4 (11.4)	-	174 (39.3)	181 (25.9)
50-59	1 (1.5)	2 (5.7)	1 (0.6)	119 (26.9)	123 (17.6)
60-69	1(1.5)	-	-	63 (14.3)	64 (9.1)
70-79	1 (1.5)	-	-	26 (5.8)	27 (3.8)
≥80	-	-	-	13 (2.9)	13 (1.9)
TOTAL (%)	66 (100)	35 (100)	156 (100)	443 (100)	700 (100)

Table 2: Sex Distribution of total refractive error and presbyopia of Patients who attended DDS Eye Centre between August 2006 and November 2012.

SEX	MYOP.	HYPER.	ASTIGM.	PRESBY.	TOTAL (%)	Chi-Square	p-value
MALE	29(43.9)	16 (45.7)	76 (48.7)	247 (55.8)	368 (52.6)	5.363	0.147
FEMALE	37(56.1)	19 (54.3)	80 (51.3)	196 (44.2)	332 (47.4)		
TOTAL (%)	66 (100)	35 (100)	156 (100)	443(100)	700(100)		

Discussion

A total of 700 patients with refractive errors and presbyopia were attended to at DDS Eye centre between August 2006 and November 2012. Eighty-eight (12.6%) were children 18 years old or less. Mean age in the study population was 36.7±3.8 Males were 368 (52.6%) while females were 332 (47.4%). Male : Female = 1.1:1. See tables 1 & 2. Sixty-six (9.4%) had myopia, 35 (5%) had hypermetropia, 156 (22.3%) had astigmatism while 443 (63.3%) had presbyopia. Among the children, 27% were myopic, 8% were hypermetropic while 64% were astigmatic.

Refractive error in children accounted for only 12.6% in this study This could be attributed to ignorance as some parents fail to bring their children, who complain of poor vision to eye care providers. They claim wearing glasses early in life worsens the vision of these children. The children only present when their performance in academics is affected. This makes health education imperative¹⁶.

More males were found with refractive errors than females in the study, though this is not statistically significant but it agrees with a similar study done in Bayelsa State, Nigeria¹⁷ where men accounted for 50.99%; this contrasts with the study by Adegbehingbe¹⁴ in 2006 who found that females tend to seek

care for correction of refractive errors than their male counterpart probably because they had more female patients in their centre.

Among the adults in this study, presbyopia was found to be the commonest cause of visual impairment accounting for over 72%. This compares well with the studies by Patel et al who had 62% in a Baltimore population¹⁸. Astigmatism accounted for 16.2%; myopia 6.9% and hypermetropia 4.6%. This agrees with the findings in Bayelsa State¹⁷, Nigeria where presbyopia accounted for 74.92% of all cases of visual impairment while astigmatism (45.63%) accounted for majority of cases of refractive error followed by myopia (22.54%) and hypermetropia (31.33%). A study done in South-South, Nigeria showed similar results¹⁹.

Conclusion:

Refractive errors still pose a great challenge in our environment. Establishment of effective primary eye care centres and embarking on health education and enlightenment programmes will go a long way to reverse this trend.

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