PATTERN OF CHILDHOOD REFRACTIVE ERRORS IN KANO, NIGERIA

***A LAWAN**

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ABSTRACT

Background: *The study is a retrospective review of the pattern of refractive errors in children 15 years of age and below in Aminu Kano Teaching Hospital from January to December, 2007.*

Patients and methods: *The clinic refraction register was used to retrieve the case folders of all patients refracted during the review period. Information extracted includes patient's age, sex, and types of refractive error. All patients had basic eye examination (to rule out other causes of subnormal vision) and streak retinoscopy at two third meter working distance. Aphakic patients had EUA and refraction four weeks after surgery. The final refraction given to the patients was used to categorize the type of refractive error.*

Results: *Childhood refractive errors accounted for 5.3% of clinic attendance and were the cause of presenting to hospital in 29% of children in that age group. The common types of refractive errors are astigmatism 53%, hypermetropia 19%, myopia 19%, and aphakia 5%.*

Conclusion: *Refractive errors are common cause of presenting in the eye clinic. Identification and correction of refractive errors in children is an integral part of child eye health.*

Author Affiliations: *Department of Ophthalmology
Faculty of Medicine
Bayero University Kano
Nigeria. **Department of Ophthalmology
Aminu Kano Teaching Hospital
Kano, Nigeria

Corresponding Author: DR A LAWAN
Department of Ophthalmology
Aminu Kano Teaching Hospital
Kano Nigeria

Email: lawal1966@yahoo.com

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INTRODUCTION

Parallel rays of light striking the eye in the position of rest are refracted and brought to a focus on the retina.[1] An eye that exhibits this condition is said to be emmetropic (normal). Refractive error or ametropia is said to occur when light rays striking the eye at rest are refracted but, not focused on the retina. Anisometropia is said to occur if there is a difference in the refractive state of the two eyes.[2] A survey in Dambatta district of Kano state, the location of our hospital showed that 2.05% of those examined had low vision and refractive error was the cause in 5%.[3] Uncorrected refractive errors can lead to amblyopia causing serious problems for children and without appropriate optical correction, millions of children can loose life time educational opportunities.[4] A study in Saudi Arabia showed that refractive error is the commonest cause of bilateral visual loss in 56% of children with low vision.[5] The aim of the study is to retrospectively determine the prevalence and different types of refractive errors seen in children (aged 15 years and below) in Aminu Kano Teaching Hospital Kano, Nigeria from January to December, 2007.

PATIENTS AND METHODS

The study is a retrospective analysis of the pattern of refractive errors in children 15 years of age and below from January to December, 2007. The clinic register was used to determine the proportion of out patients presenting with refractive errors, and the prevalence of refractive errors in children. The patient's case folders were retrieved and the following information was obtained; patient's age, sex, and type of refractive error seen in our hospital during the review period. The patients studied had unaided and pin hole visual acuity done with Snellen's or "E" charts (for verbal and school age children). All patients had basic eye examination including fundoscopy to rule out other causes of subnormal vision. All patients had streak retinoscopy at two third meter working distance. Patients for cycloplegic refraction were placed on atropine 1% ointment twice a day for two days before the procedure was done. No ointment was applied on the day of refraction. For these patients subjective refraction was performed three weeks after the cycloplegic refraction. The final subjective correction given was used to define the type of refractive error. Aphakic patients had examination under anesthesia (EUA) refraction four weeks after surgery. Data was collected and analyzed using simple descriptive methods.

RESULTS

A total of 4687 out patients were seen during the study period, 857 were children aged 15 years or less. Of this total, 1376 patients had refractive errors and 248 were children. The overall prevalence of refractive errors in our clinic was 29.4%. Childhood refractive errors accounted for 5.3% of total clinic attendance and were the cause of presenting to hospital in 29% of children in that age group. There were 113 males and 135 females

(M: F= 1: 1.2). Forty nine patients (19.8%) had cycloplegic refraction and 199 (80.2%) had non cycloplegic refraction. Forty patients (16%) had various types of anisometropia. The difference between the two eyes was 2.00 diopters or more in 9 patients (1.05%). Thirteen patients had congenital/ developmental cataracts and were examined and refracted under anesthesia (EUA) four weeks after cataract surgery. The distribution of the patients by age and sex is shown in table I. Refractive errors were most common in the 10 to 14 years age group accounting for 43% of the patients. Various types of astigmatism accounts for 53%, hypermetropia 23% as illustrated in table II.

Table I: Distribution of children with refractive errors by age and sex

Age in years	Sex		Total (%)
	Male	Female	
<5	13	15	28 (11)
5-9	26	17	43 (17)
10-14	51	55	106 (43)
15	23	48	71 (29)
Total	**113**	**135**	**248 (100)**

Table 2: Distribution of types of refractive errors in children

Type of refractive error	Sex		Total (%)
	Male	Female	
Myopia	23	25	48(19)
Hypermetropia	29	28	57(23)
Myopic Astigmatism	19	20	39(16)
Hyperopic Astigmatism	9	12	21(9)
Mixed Astigmatism	27	43	70(28)
Aphakia	6	7	13(5)
Total	**113**	**135**	**248(100)**

DISCUSSION

The diagnosis and successful treatment of visually significant refractive errors in children is a subject of continued study and debate.[6] Childhood visual impairment due to refractive errors is a significant problem in school children and has a considerable impact on public health.[7] Childhood refractive errors accounted for a third of number of children attending our outpatient clinic, it is slightly commoner in girls than boys similar to the studies in Kolkota and Cairo[7,8] although there was no statistically significant difference between the two groups in the Cairo study. Refractive error is the most common eye disease in school children in Accra and was reported in 7% of those examined.[9] Our study is hospital based and may not be an exact representation of a population survey, however there is a clear indication that refractive errors are a common cause of abnormal vision in the patients studied. The prevalence of refractive errors in children in Nkanu-West district of south-eastern Nigeria was 1.97percent.[10] Visual impairment from refractive errors occurred in 0.87% of school children examined in Ilesa, south-western Nigeria.[11] Most school based studies are silent on the types of refractive errors found in the children examined.[7,8,9,10,11] In our study, mixed astigmatism was the commonest type of refractive error. Amongst the native tribe of Arizona the prevalence of astigmatism in school aged children was 44.4%, anisometropia is higher and occurred in 15% of the children examined.[12] In Poland, hypermetropia was reported in 38%, and only 4% were astigmatic.[13] Hypermetropia was the second common type of refractive error in the patients we studied. Hypermetropia is strongly associated with many common eye conditions, particularly amblyopia and strabismus.[14] Hypermetropia (7.5%) and astigmatism (5.5%) are the most frequent refractive errors among low income pre school children in San Diego.[15] Uncorrected visual impairment occurred in 18.6% of school children and 93% was due to refractive errors, myopia was higher among upper-middle socioeconomic school children in Kathmandu than Nepal.[16] Myopia was the third common type of refractive error in this study. Parental myopia was associated with more myopic spherical equivalent refraction and longer axial length in their children, with significant ethnic interactions reported in a study from Sydney, Australia.[17] Spectacle correction was the main modality of correcting refractive errors in our hospital. This is simple, accessible, affordable, available and none invasive means of correcting refractive errors. Pediatric frames that hug the patients face and with a clip at the back of the head (that makes it difficult for the child to remove) are not easily available. Uptake of spectacle correction is poor even when freely given at 3 months follow up in Tanzania.[18] A study of Asian children showed that topical atropine was well tolerated and effective in slowing the progression of low and moderate myopia and ocular axial elongation in Asian children.[19] Contact lenses are a good alternative in children with anisometropia. These are not available in our hospital. The majority of children with anisometropia do well with glasses or contact lenses, but a minority do not. Some pediatric refractive surgeons employ advance surface ablation using the excimer laser such as photo refractive keratectomy or laser assisted sub epithelial keratomileusis.[20] Screening of children for refractive errors is economically attractive and of public health importance. Prompt identification and management of childhood refractive errors should be an integral part of eye care delivery as it affects children in our community.

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