ORIGINAL ARTICLE

Ocular disorders in children in Zaria children's school

ER Abah, KK Oladigbolu, E Samaila, A Gani – Ikilama[1]

Department of Ophthalmology, Ahmadu Bello University Teaching Hospital, Shika, [1]Hope for the Blind Foundation, Wusasa, Zaria, Nigeria

Abstract

Background: The main causes of blindness in children change over time. The prevalence and pattern of eye diseases in children were studied in northern Nigeria 6 years ago. This study like the previous one was a school eye health screening conducted in Zaria children school located at the centre of Zaria, a city in northern Nigeria.

Aims and Objectives: to determine the current prevalence and pattern of eye diseases affecting school children in Zaria. This is to serve as a current template for planning eye care for children in Zaria and environs.

Materials and Methods: a cross sectional study of 327 children who completed a pre-designed school eye screening format was conducted. Consent was obtained from the school authority and the parents before the screening exercise. It involved assessment of visual acuity, anterior and posterior segment examination and colour vision testing. Intraocular pressure measurement and refraction were done for those with indications.

Result: A total of 327 children were examined, out of which 45.6% (n=149) were males and 54.4% (n=178) were females. M: F=1:1.2. Age range 5-17yrs with mean of 9.6 ± 3.1(SD). The commonest causes of eye disorders were refractive errors 8.0% (n=26), allergic conjunctivitis 7.3 % (n=24), glaucoma suspects 3.7% (n=12) and colour deficiency 1.5%(n=5).

Conclusion: The major causes of childhood eye disorders were uncorrected refractive errors and allergic conjunctivitis. The predominance of uncorrected refractive error is similar to what is obtainable in other parts of the world especially in the urban areas.

Key words: School Children, Ocular disorders, Zaria

Date of Acceptance: 23-Oct-2011

Introduction

School eye health screening is necessary for the following reasons:

- There are 1.4 million blind children in the world and out of which 300,000 are in Africa.[1]
- The children have a lifetime of blindness ahead of them with an estimated 75 million blind years. This is second only to age-related cataract.[2]
- Amblyopia develops if visual disorders in children are not managed promptly.[3]
- In developing countries, 60% of children die within a year of going blind.[2]
- The main causes of blindness in children change overtime.[2]
- Children do not readily articulate their problems and therefore, periodic screening remains a major option.[3]

Children should receive prompt and proper eye care in order to avoid vision-threatening problems, which could affect their learning ability, personality and adjustments in school.[4,5] The complaints related to these eye morbidities may originate from the children themselves, parents or even teachers.[6]

Address for correspondence:
Dr. Abah Emmanuel Raphael,
Department of Ophthalmology, Ahmadu Bello University Teaching Hospital, Shika, Zaria, Nigeria.
E-mail: emmanabah@yahoo.com

Access this article online	
Quick Response Code:	**Website:** www.njcponline.com
	DOI: 10.4103/1119-3077.91759
	PMID: 22248953

The primary school setting serves as a ready pool for interventions with respect to childhood blindness which is a vision 2020 priority.[7]

The age range of those in primary school also falls into one of the stages recommended by American Academy of Ophthalmology and American Association of Paediatric Ophthalmology and Strabismus for examination of children's eyes (new born nursery, six months, three years, five years and older).[8] This is applicable to developing countries as part of vision 2020 action plan which encourages fundus examination as early as four to six weeks after birth for infants at risk.[2] The spectrum of ocular problem varies from country to country and even from region to region in the same country.[4]

Materials and Methods

A descriptive, cross-sectional study of 327 children from Zaria Children's School, a school located within Zaria G.R.A, was conducted. The school was purposively selected because of diverse population. It has three sections: nursery, primary and junior secondary. All the children from these sections were included in the study except those who were either absent or whose parents did not give consent. Written permission from the school authority and informed consent from parents were obtained prior to the screening exercise. Pre-designed school eye screening formats drawn up by the authors to extract information on bio-data, general medical and ocular history and also document vision screening were distributed to various class teachers. The formats were completed with the help of the parents and class teachers a day before the screening.

The students were assessed within the school premises by a team of three ophthalmologists and three staff of "Hope for the Blind Foundation". Anterior and posterior segments of the eyes were examined by the ophthalmologists using pen torch, direct and indirect ophthalmoscope. They also carried out color vision testing on the students using Ishihara chart. The visual acuity of the students for distance and near were tested by three trained staff of the foundation using the conventional Snellen's chart and reduced Snellen's chart respectively. They were trained and tested by the ophthalmologists until they were certified as capable of performing these tests.

The children who had visual acuity of 6/9 or worse but improved with the use of pin hole were refracted with a streak retinoscope. Refractive error was defined as any error of 0.5 diopters or more in one or both eyes. Allergic conjunctivitis was defined as recurrent itching, conjunctival injection/brownish discoloration with or without limbal follicles.

Tonometry was done for children with suspicious cup disc ratio, defined as cup disc ratio of 0.5 or more or asymmetry of >0.2, using Perkin's applanation tonometer after instilling 1-2 drops of proparacaine hydrochloride 5 mg/ml.

Results

A total of 327 students were examined. Their age range was between 5 and 17 years with a mean of 9.6 years ± 3.1 (SD). Males constituted 45.6% (n=149) and females 54.4 % (n=178). The M: F ratio was 1:1.2 [Figure 1].

Out of the total sample, 324 had unaided visual acuity between 6/4 and 6/18 (no visual impairment), but 3 children had visual acuity between 6/24 and 6/60 (visual impairment) – Tables 1 and 2.

The prevalence of ocular disorders in this study population was 22.6%.

The most common disorder was uncorrected refractive

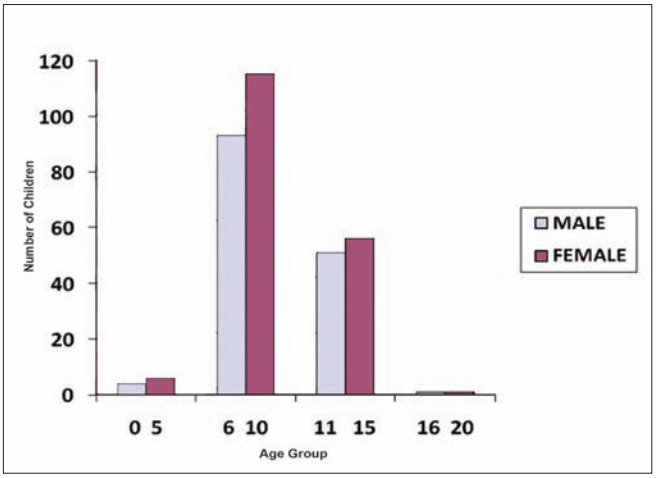

Figure 1: Age and sex distribution

Table 1: Visual acuity by sex

Sex	Vision	6/24 – 6/60	Total
M	148	1	149
F	176	2	168
TOTAL	324	3	327

χ^2 = 2.7020 df = 1, significant level 0.05; Cv = 7.8147 (P> 0.05)

Table 2: Visual acuity by age

Age (Years)	6/4-6/18	6/24 – 6/60	Total
0-5	10	0	10
6-10	207	1	208
11-15	105	2	107
16-20	2	0	2
Total	324	3	327

χ^2 = 2.1841 df = 3 significant level 0.05; cv = 3.8415 (P>0.05)

error prevalence (8.0%, $n=26$) with hypermetropia leading. Prevalence of spectacle use was 3.1%. This was followed closely by allergic conjunctivitis, prevalence = 7.3% ($n=24$).

The prevalence of glaucoma suspects was 3.7% ($n=12$). One child had asymmetry of CD ratio > 0.2 while the others had CD ratio > 0.6 in both eyes. Two children had intra ocular pressure > 21mmHg.

Color vision deficiency was the next with a prevalence of 1.5% ($n=5$). Three children had red – green defect and two had red – blue color defects.

One child was a known sickler who had a tinge of jaundice but no fundal changes. Other abnormalities found include unilateral hyaloid artery remnant, bilateral optic neuropathy, moderate bilateral congenital ptosis, and a convergent esotropia, Tables 3 and 4.

None of the children had the typical nutritional corneal opacity. No case of infective conjunctivitis was seen.

Table 3: Diagnosis by sex

Diagnosis	Male	Female	Total (%)
No abnormality detected	112	141	253(77.4)
Allergic conjunctivitis	12	12	24(7.3)
Refractive error	12	14	26(8.0)
Molluscum contagiousum	0	1	1(0.3)
Hyaloid artery remnant	1	1	2(0.6)
Colour deficiency	2	3	5(0.5)
Glaucoma suspect	7	5	12(3.7)
Sickle cell disease with jaundice	1	0	1(0.3)
Optic neuropathy	0	1	1(0.3)
Ptosis	1	0	1(0.3)
Squrit	1	0	1(0.3)
Total	149	178	327 (100.0)

χ^2 = 6.45 df = 10, significant level = 0.05; cv = 18.3070 ($P>0.05$)

Discussion

The prevalence of ocular disorders in this study group was 22.6%. This was much higher than the 8.4% reported six years ago in this part of the country by Kehinde.[9] However, Ajaiyeoba[10] in a study amongst students of south western Nigeria reported a prevalence of 15.5%. The high prevalence of eye disorder can be attributed to a relative increase and the prevalence due to the higher sample size in the previous study or a true rise in prevalence of eye disorders.

The WHO recommended level for visual impairment of less than 6/18 in the better eye[11] was used in this study. Only 1% had visual impairment. The slightly higher level in females is probably because females were more in the sample population. The higher level between the ages of 6-15years was because most of the children fell within this age bracket.

The prevalence of uncorrected refractive error in this study was 8.0 %. There is a significant rise as compared to 1.7% earlier documented by Kehinde.[9] This is attributable to the fact that Zaria is an urban setting where prevalence of uncorrected refractive error is likely to increase. In South East Asia, the prevalence of myopia has increased dramatically among children particularly in urban areas.[2] In addition, it has been found that globally, uncorrected refractive error is the main cause of visual impairment in children aged 5-15 years.[2] In our study, 92% were in this age bracket. In south – western Nigeria, Ajaiyeoba[10] documented a prevalence of 5.8% for uncorrected refractive errors. Faderin[12] also reported a prevalence of 7.3% for uncorrected refractive error in primary school children of south western Nigeria with hypermetropia predominating. The findings of this study were similar to ours. The prevalence of uncorrected refractive error among Chinese children of school age was found to be 20.7 by Lian *et al*.[13] It is not unusual because the prevalence of uncorrected refractive error in South East Asia is quite high.[2] Allergic conjunctivitis was the next common in our study with a prevalence of 7.3% as compared to 4.5% earlier

Table 4: Diagnosis by age

Diagnosis	0-5	6-10	11-15	16-20	Total
No abnormality detected	8	165	79	1	253
Allergic conjunctivitis	0	19	5	0	24
Refractive error	1	10	14	1	26
Mollusum contagious	0	1	0	0	1
Hyaloid century remnant	0	1	0	0	2
Colour deficiency	0	5	0	0	5
Glaucoma suspect	0	7	5	0	12
Sickle cell disease With jaundice	0	0	1	0	1
Optic neuropathy	0	0	1	0	1
Ptosis	0	1	0	0	1
Squint	0	1	0	0	1
Total	10	208	107	2	327

χ^2 = 7.3010, df = 30 significant level 0.05; cv = 43.7729 ($P>0.05$)

documented in our settling. Several studies in Nigeria have documented the high prevalence of allergic conjunctivitis in children.[14-17] It is less common in temperate countries where it is usually seen in higher frequency during the warm summer months.[18]

Glaucoma suspects constituted 3.7%. This was relatively high compared to the findings in south western Nigeria by Ayanniyi,[19] (0.8%) six years ago. The prevalence may have risen over the years or originally high in this part of the country. The earlier study in northern Nigeria did not document this.

Similarly color deficiency was not documented in the previous study but we found a prevalence of 1.5% ($n=5$) in our study. Out of these, three had red-green defect and 2 had red-blue color deficiency. Tabansi[20] reported a lower prevalence of 2.6% in primary school children of southern Nigeria.

Corneal scars/opacities were not seen in this study probably because it is an enlightened population that has complied with the EPI (expanded program on immunization) program and vitamin A distribution. As a consequence of child survival programs (e.g., integrated management of childhood illness), corneal scarring due to measles and vitamin A deficiency is declining in many developing countries.[2]

Infective conjunctivitis was also not documented, probably because of good personal hygiene. The fact that it is an enlightened population is also likely to have contributed.

Other ocular abnormalities such as molluscum contagiosum, squint, hyaloid artery remnant and optic atrophy [Tables 3 and 4] were seen in insignificant numbers in both studies.

Conclusions

The major causes of childhood eye disorders were uncorrected refractive errors and allergic conjunctivitis. The predominance of uncorrected refractive error is similar to what is obtainable in other parts of the world especially in the urban areas.[2] Corneal opacities / scar and infective conjunctivitis are on the decline probably due to the positive impact of immunization against measles and vitamin A distribution. This must have resulted in a decline in the incidence of measles and vitamin A related keratopathy.

Similar to the findings of Nwosu.[21] in south western Nigeria, the major eye disorders in school children of Zaria are largely treatable or preventable.

This study was designed to serve as a current template for children's eye care in Zaria metropolis and environs.

References

1. World health organization. Preventing blindness in children. Report of WHO/IAPB scientific meeting. Geneva, 2000 (WHO/PBL/00.77).
2. World Health Organization. Vision 2020 Action Plan 2006 – 2010;14:2, 20:28-32.
3. Narayana KM, Bora A, Biswas J. Pattern of uveities in children presenting at a tertiary eye care centre in south India. India J ophthalmology 2003;52:129-32.
4. Pratab VB, Lai H.B. Pattern of pediatric ocular problems in North India. India J ophthalmol 1989;37:171-2.
5. Adegbehingbe BO, Adeoye AO, Onakpoya OH. Refractive errors in childhood. Nig J Surg Sci 2005;15:19-25.
6. King RA. Common ocular signs and symptoms in childhood. Paed Cli North Am 1993;40:753-66.
7. Okoro FI, Okafor UF. Ocular screening among pupils in public primary schools in Edo state of Nigeria. Pak J Nutrit 2009;8:1446-9.
8. Alaettin U, Unal A, Mustafa T. Vision screening among children in primary schools in a district of western Turkey; an epidemiological study. Pak J Med Sci 2009;25:976-81.
9. Kehinde AV, Ogwurike SC, Eruchalu UV, Pam V, Samaila E. School Eye Health screening in Kaduna – northern Nigeria. Nig J Surgi res 2005;7:191-4.
10. Ajaiyeoba AI, Isawumi MA, Adeoye AO, Oluleye TS. Prevalence and causes of eye diseases amongst students in south-western Nigeria. Ann Afr Med 2006;5:197-203.
11. WHO international classification of diseases. World Health Organization Geneva. 1975.
12. Faderin MA, Ajaiyeoba AI. Refractive errors in primary school children in Nigeria. Nig J Ophthalmology 2001;9:10-4.
13. Lian-Hong P, Lin C, Qin L, Ning K, Jing F. Refractive error status and prevalence of refractive errors in sub-urban school age children. Int J Med Sci 2010;7:342-53.
14. Abiose A. Paediatric ophthalmic problems in Nigeria. J Trop Paediatr 1985;31:30-5.
15. Akinsola FB. Pattern of eye disease in Nigerian children seen at L.U.T.H, a decade after. Nig Med Practitioner 1993;25:41-53.
16. Ajaiyeoba AI. Childhood eye diseases in Ibadan, Nigeria. Afr J Med and Med Sci 1994;23:227-31.
17. Onwasigwe EN, Umeh RE, Onwasigwe CN, Aniebue PN. Referral pattern of children to the eye department of UNTH, Enugu, Nigeria. Nig J Ophthalmol 1996;4:5-6.
18. Smolin G, Richard O, Connor G. Ocular immunology. 2nd ed. Boston USA: Little Brown and company limited; 1986. p. 158-70.
19. Ayanniyi AA, Fatai OO, Abdulkareem OM, Rashidat OA. Clinical findings among Nigerian paediatric glaucoma suspects during a school eye health survey. Open Ophthalmol J 2008;2:137-40.
20. Tabansi PN, Anochie K, Nkanginieme KE, Pedro-Egbe CN. Screening for congenital colour vision deficiency in primary children in Port Harcourt city; teachers knowledge and performance. Niger J Med 2008;17:428-32.
21. Nwosu SN. Childhood eye diseases in Anambra state, Nigeria. Nig J Ophthalm 1999;7:34-8.

How to cite this article: Abah ER, Oladigbolu KK, Samaila E, Gani - Ikilama A. Ocular disorders in children in Zaria children's school. Niger J Clin Pract 2011;14:473-6.
Source of Support: Nil, **Conflict of Interest:** None declared.