

## Original Article

### School eye health screening in Kaduna -Northern Nigeria

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#### Abstract

**Background:** Five public primary schools referred to as Local Education Authority (L.E.A.) primary schools, were identified for this study. The aim was to find out the pattern of eye disorders affecting primary school children in Kaduna North metropolis and to offer treatment to those with treatable disorders.

**Method:** A total of 2,397 pupils whose classes ranged from primary one to six and aged between five to eighteen years were examined.

**Results:** Of this number, 1,232 (51.57%) were males and 1,161 (48.43%). The commonest causes of eye disorders were allergic conjunctivitis (14.5%), refractive error (1.7%), and infective conjunctivitis (1.4%).

**Conclusion:** School eye screening visits should be at least once a year and should involve screening of all nursery one and primary one pupils. School teachers can be trained to measure visual acuity. Primary eye care workers may be trained and utilised to carrying out school screening in schools, while basic eye health classes can be taught in ante-natal classes to enlighten mothers who are the primary care givers. Early detection of eye conditions in children is an advantage for management.

#### Materials and Methods

Five public primary schools referred to as Local Education Authority (L.E.A.) primary schools, were identified for this study. Permission was sought from the schools' head-teachers after which a date was set on which per-designed school screening formats drawn up by the authors were distributed to the various class teachers. They were taught to assess visual acuity using Snellen's charts. In addition, they were to collect demographic data such as age, sex, religion. Following a pre-drawn roster, five teams consisting of one consultant ophthalmologist and two ophthalmic residents visited one school each to examine the students. All pupils with visual acuities less than 6/6 were double checked by a resident ophthalmologist. Pupils with visual acuity less

than 6/6 had a visual acuity test with a pin-hole and were referred to the clinic for refraction, which was done with a streak retinoscope. Ocular examination was done with a pen torch for the anterior segment and a direct or (indirect ophthalmoscope) where indicated for the posterior segment. Pupil dilatation was with 1% Tropicamide and 2.5% Phenylephrine. Tonometry, and when indicated was with a Goldmann applanation tonometer. Data entry was into a pre-designed form after which a diagnosis was made. All pupils with allergic conjunctivitis were given a bottle of a topical antihistamine preparation free, whilst those with infective conditions were treated with antibiotic ointment.

Table 1a: Visual acuity by sex

Sex	Vision		Visual acuity not measured; believed not blind	Total
	6/4-6/18	6/24-6/60		
M	1232	2		1234
F	1161	1	1	1163
<b>Total</b>	<b>2393</b>	<b>3</b>	<b>1</b>	<b>2397</b>

#### Results

**Table 1b: Visual acuity by age**

Age (years)	6/4-6/18	6/24-6/60	Cannot be measured: believed not blind	Total
0-5	36			36
5-10	1451		1	1452
10-15	873	3		876
15-20	33			33
<b>Total</b>	<b>2393</b>	<b>3</b>	<b>1</b>	<b>2397</b>

Of the 2397 pupils examined, 2393 had unaided visual acuity of between 6/4-6/18, 3 pupils had between 6/24-6/60, whilst one sighted pupil who was said to have said to have subnormal intelligence was uncooperative.

**Table 2a: Diagnosis by sex**

Diagnosis	Male	Female	Total
No abnormality detected	1132	1063	2195
Vernal/Allergic conjunctivitis	64	45	109
Refractive error	7	34	41
Infective conjunctivitis	19	14	33
Subconjunctival haemorrhage	2	2	4
Stye	2	1	3
Corneal opacity	2		2
Optic atrophy	1		1
Molloscum contagiosum	1		1
Squint		1	1
Others (Distichiasis, hyaloid artery remnants)	4	3	7
<b>Total</b>	<b>1234</b>	<b>1163</b>	<b>2397</b>

**Table 2b: Diagnosis by age**

Diagnosis	0-5	5-10	10-15	15-20	Total
No abnormality detected	34	1322	808	31	2195
Vernal/Allergic conjunctivitis	2	72	35		109
Refractive error		24	16	1	41
Infective conjunctivitis		23	9	1	33
Subconjunctival haemorrhage		2	2		4
Stye		2	1		3
Corneal opacity		2			2
Optic atrophy		1			1
Molloscum contagiosum		1			1
Squint		1			1
Others (Distichiasis, hyaloid artery remnants)	3	5	8		16
<b>Total</b>	<b>36</b>	<b>1452</b>		<b>33</b>	<b>2397</b>

The commonest disorder found was allergic conjunctivitis (4.5%), followed by refractive error in 41 pupils (.7%), and infective eye conditions 33 pupils (1.4%). Two pupils (0.08%), had corneal opacities following trauma.

## Discussion

Children constitute about 45%<sup>1</sup> of the population of Nigeria, with about 15-20% being within the range of 5-15 years. School children are a “captive” population and are relatively accessible to intervention, this facilitates easy and early assistance to any child with visual problems<sup>2</sup>. Childhood eye disorders can contribute to the burden of blindness in a society. The magnitude of childhood visual disorders in Nigeria is unknown. However, reported studies conducted among school children have shown that ocular morbidity is a hindrance in the identification of cases where preventable causes of blindness and low vision can be addressed at an early age. In addition, procured data is important in planning primary eye health care services and in the determination of relevant health policies. Unfortunately however, primary school screening parameters vary with different programmes and there is need for standardisation<sup>5</sup>. The DANPCB Vision screening programme uses the Snellen’s 6/9 E-chart<sup>7</sup>. Inability to read this with any eye is a failed screening test, following which further examination is then carried out on the subject. Other programmes have used the WHO recommended level for visual impairment of less than 6/18 in the better eye<sup>8</sup>. In Onitsha, Anambra state of Nigeria, Nwosu<sup>9</sup> found major ocular disorders to be vernal conjunctivitis, ametropia, and external eye infections and concluded that the major causes of ocular morbidity in the children were treatable or preventable. The commonest cause of ocular morbidity in this study was allergic conjunctivitis. Several studies in various parts of Nigeria have documented the high prevalence of allergic conjunctivitis in children<sup>10,11,12,13</sup>. It is not as common in temperate countries where it is usually seen in higher frequency during the warm summer months<sup>14</sup>. Refractive error was responsible for 1.7% of ocular disorders. Abiose<sup>10</sup> in a hospital based study for 500 children in Kaduna, found a prevalence of 2%. In the south-western Nigerian city of Lagos, Majekodunmi<sup>15</sup> in a similar study found a frequency of 24%, Akinsola<sup>11</sup> 26.8%, and Onwuasigwe<sup>13</sup> in the south-eastern city of Enugu, 38%. A three-year school health screening report of 54,909 school children in Kaduna<sup>16</sup> found 6284 children with eye disease. 5% of ocular morbidity in this group was caused by refractive error.

## Conclusion

In this study the commonest causes of eye disorder were allergic conjunctivitis, refractive errors and infective conjunctivitis. About 30% of the pupils referred to the clinic for further examination kept their appointments. Some of the parents and guardians, who were artisans, and market traders, felt they could not afford to come to the hospital as this would result in loss of income. Defaulting in keeping referral appointments is a problem that has been identified elsewhere. For example, in vision screening of pre-

Refractive error appears to be more common in children in the south of Nigeria than in the northern parts. In General however, refractive errors and squints are believed to have a relatively lower incidence in black skinned races<sup>10,11,15</sup>. Hereditary factors are thought to be responsible for the peculiar epidemiology of these disorders in black skinned races. Despite the low incidence, pre-school screening to enable early diagnosis has been advocated. Unilateral opacities following trauma were seen in two male children, and did not affect vision. Trauma is a leading cause of corneal scarring and unilateral blindness in children. The incidence is higher in males than in females, obviously due to their rambunctious nature. Onwuasigwe<sup>13</sup> in Enugu, reported 60 children with trauma forming 8.2% of paediatric out-patients seen, with blunt trauma as the commonest cause. Although penetrating trauma and intraocular foreign bodies are not as frequently seen in children as blunt trauma, Pam in a retrospective study in Kaduna found that up to 35% of patients with retained intraocular foreign bodies were children who had sustained injury playing with broomsticks<sup>17</sup>. In Tanzania<sup>18</sup>, another study found refractive errors, trachoma, strabismus, amblyopia, corneal scarring resulting from trauma as well as night blindness and other causes of vitamin A deficiency in school children. Naidooks et al in South Africa found the prevalence of reduced vision to be due mainly to uncorrected refractive errors as well as corneal and other anterior segment abnormalities. In southern India, Kalikivayi V<sup>20</sup> collected data which supports the assumption that vision screening of school in developing countries is useful in detecting correctable causes of low vision, especially refractive errors, and in reducing long term permanent visual disability. Limburg et al<sup>21</sup>, in India found vision screening in schools increased the coverage of eye care provision and reduced the workload of eye care staff. They found refractive errors to be very common. In Saudi Arabia, Bardisi<sup>22</sup> concluded that vision screening is very important and recommended it to be carried out as part of a periodic health examination for pre-school children. It is considered cost effective, highly sensitive, acceptable and easy to administer

school children by Bardisi in Jeddah, Saudi Arabia<sup>22</sup>, 70% of 102 children referred to the ophthalmologist kept their appointment. In a population based study of 2,938 children in Manhattan, U.S.A, 91% of children referred to eye-care professionals were re-evaluated. However, visits to an eye care professional were often delayed; median time was 0.8 years for children seeing an ophthalmologist and 1.8 years for children seeing an optometrist. School teachers can be trained to measure visual acuity, and to detect a ‘bad’ eye. Pupils w

Primary eye care workers may be utilised for school eye screening. School visits should be at least once a year and should involve screening of all nursery one and primary one pupils. Basic eye health care may be taught in antenatal health classes. This would raise We wish to express our gratitude to the head teachers and teachers of L.E.A Primary School Sabon Gari, L.E.A. Primary School Kabala-Costain, Kaduna North Local Government Area Nursery/Primary School

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suspected abnormalities can be referred to the nearest eye clinic or primary health care centre in rural areas. awareness in mothers who are the primary child care givers.

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