



Original Research Article

Outcomes of school health programme - study at tertiary care centre

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ABSTRACT

Background: Refractive error is most common cause of avoidable blindness and affects large proportion of school students. It has become hurdle for educational lost which leads to long term consequences of nation's economic loss. Hence, visual screening of children on commencement of school will help in early detection of refractive error with better life and empowerment to children in future.

Aim and Objective: To identify magnitude of types of refractive errors, amblyopia and congenital anomalies in school going children

Material and Methods: 350 referred students aged between 6-17 yrs attending tertiary care hospital were assessed for V/A of distance, near along with anterior and posterior segment examination to determine magnitude of refractive error and their data were analyzed by chi- square test.

Results: 350 students were examined at tertiary care centre. 309(88.3%) students were having refractive error. 15 (4.3%) students were detected with media and fundus abnormalities and 10(2.8%) students were amblyopic.

221 students (63.1%) were Myopic (spherical equivalent of at least -0.50 D in either eye) with male predominance and 101(45.7%) students as low degree of myopia. 58(16.6%) were Hyperopic (+2.00 D or more with 32(55.2%) students falling under 5 yrs age group and 30(8.6%) students were Astigmatic (cylinder of > or = 0.75 D).

Conclusion: An ounce of prevention is worth a pound of cure. Refractive error is serious health problem in school going children and its elimination requires integrated system from regular check up to providing spectacles and can lessen the low vision burden on society.

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1. Introduction

1. Childhood blindness is increasingly becoming a major challenge world wide
2. An estimated 15 million children are bilaterally blind, most live in the developing world.^{1,2}
3. Refractive errors (myopia, hyperopia and astigmatism) affect a large proportion of the population worldwide,³ irrespective of age, sex and ethnic group. They can be easily diagnosed, and corrected with spectacles to attain normal vision. If, however, they are not corrected or the correction is inadequate, refractive errors become a major cause of low vision and

even blindness. Visual impairment from uncorrected refractive errors can have immediate and long-term consequences in children and adults, such as lost educational and employment opportunities, lost economic gain for individuals, families and societies, and affects the quality of life.

4. Blurred vision from refractive error can be relieved—in most cases—by neutralizing the refractive error with spectacles, contact lenses, or refractive surgery.⁴
5. Nevertheless, the high prevalence of refractive errors and the cost of refractive correction make these conditions a substantial public health and economic problem in many parts of the world.^{5,6}

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6. Screening programs are valuable to prevent refractive error related vision loss in children. And can help to overcome all barriers against visual rehabilitation.⁷ In countries with high attendance of children in schools, integration of vision screening within screening for other health issues is recommended by WHO.
7. In response to this global need, the WHO launched in 1999 the Vision 2020: The Right to Sight, an initiative in partnership with non-governmental organizations (NGOs) and eye care organizations. Vision 2020 aims to eliminate avoidable blindness in the world by 2020 and targets the world's leading causes of avoidable visual impairment, by developing effective strategies against it.

2. Materials and Method

2.1. Study design

Retrospective study.

2.2. Inclusion criteria

All referred children aged between 6-17 yrs to tertiary care hospital from primary health centre and schools during first 20 months were included in the study.

2.3. Exclusion criteria

Referred children who doesn't allow or is not willing for ophthalmic examination.

All 350 referred children were assessed for visual acuity for distance with Snellen chart at room illumination AT 6 METRE, and for near with near vision chart at 25 cm or working distance.

Calibrated auto-refractometry and Subjective refraction was done to identify the types of refractive error -Myopia, 3.4%) Hyperopia, Astigmatism.

Streak Retinoscopy under cycloplegia (1% cyclopentolate) was performed.

Later, Post-mydriatic acceptance was given to the children.

Those with BCVA 6/12 or worse, underwent anterior segment examination with slit lamp biomicroscope. Intraocular pressure. Retinal examination was performed with the help of direct ophthalmoscope for central fundus involving disc and macula and in dilated pupil with non contact indirect ophthalmoscope 78D or 90D. To rule out any retinal abnormalities.

The data collected were analysed by chi square test.

3. Results

Total 350 screened children in school health programme were examined at tertiary care hospital among which

Unaided V/A was normal (6/6) in 12 (3.4%) referred students. Out of 309 students, 143(46.3%) students had

Table 1: Gender distribution

Sex	Number of Students
Male	186(53.1%)
Female	164 (46.9%)

Table 2: Age distribution

Age (yrs)	Number of students (%)
<5 yrs	102 (29.1%)
5-10 yrs	100 (28.6%)
>10 yrs	150 (42.9%)

presenting V/A 6/9-6/18 and 118(38.2%) students had V/A 6/24-6/60. 158 students were wearing glasses.

Table 3: Presenting visual acuity in children

Unaided visual acuity	Number of students
6/9-6/18	143(46.3%)
6/24-6/60	118(38.2%)
<6/60	48 (15.5%)

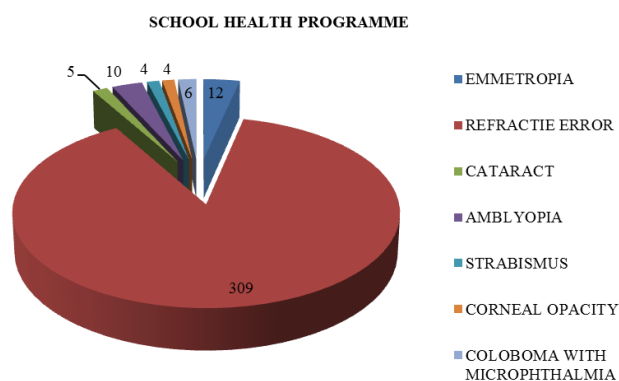


Fig. 1: Analysis of eye diseases

Table 4: Degree of myopia

Degree of myopia	Number of students
Low (<3 d)	101(45.7%)
Moderate (3-6d)	90(40.7%)
High (>6d)	30(13.6%)

Infants with moderate to high hyperopia (greater than +3.50D) are up to 13 times more likely to develop strabismus by age 4 if left uncorrected.⁸ 30(51.7%) students were having <2 D, 16(27.6%) students were having 2-4D and 12(20.7%) students were having <5D.

The chances of astigmatism is decreased with increasing age.

*myopic astigmatism more common than hyperopic astigmatism.

*2 children were having bilateral cataract and 2 children were having unilateral cataract.

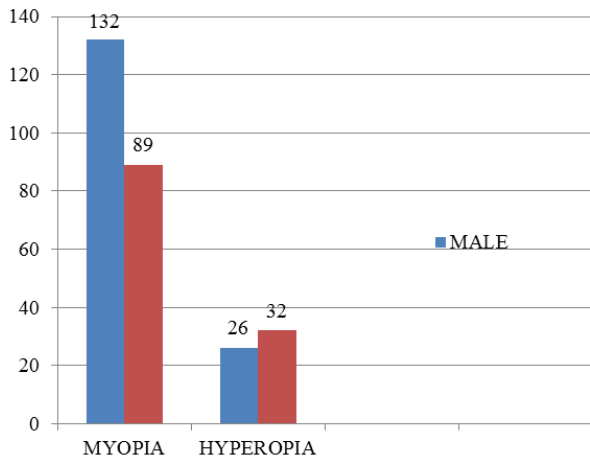


Fig. 2: Gender distribution of myopia and hyperopia

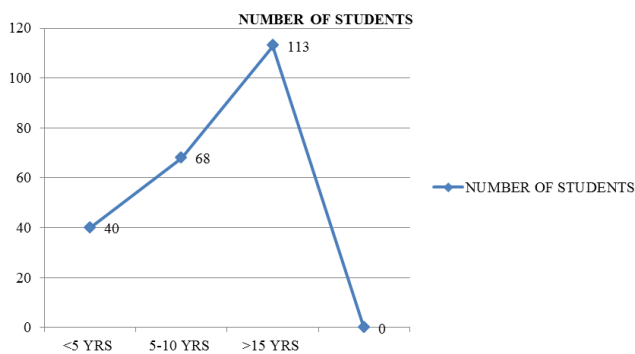


Fig. 3: Age distribution of myopia

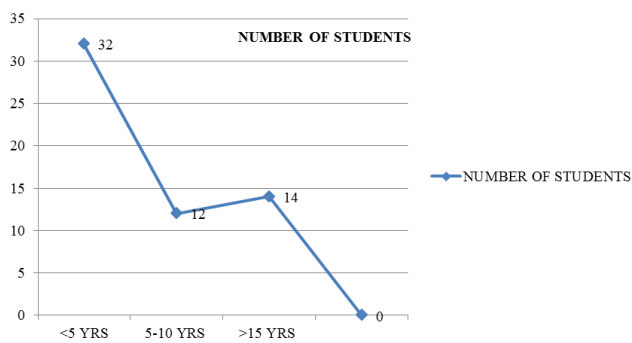


Fig. 4: Age distribution of hyperopia

Table 5: Age distribution of astigmatism

Age	Number of students
>5 yrs	12(40%)
5-10 yrs	8(26.7%)
>15 yrs	10 (33.3%)

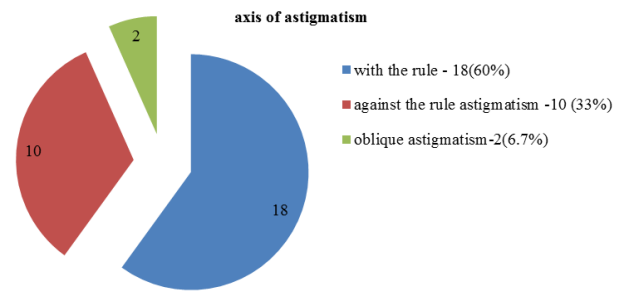


Fig. 5: AXIS of astigmatism

Table 6: Cataract

	Number of students
With torch infection	2
Forceps delivery	2
No cause	1
Total	5

4. Discussion

This is hospital based retrospective study where 350 children enrolled. Out of which 221 (63.1%) were myopic and 58(16.6%) were hyperopic and 30(8.6%) were having astigmatism.

No child is having recurrent sty, chalazion and blepharitis though they are indirect sign of uncorrected refractive errors. Secondly, 20 children among the examined children had bitot spot and were treated with vitamin A syrup by collaborating with pediatrics. 20 among examined children were having vernal kerato-conjunctivitis and were treated with antihistamines and NSAIDS and steroids if required.

In this study, most common refractive error found was Myopia (spherical equivalent of at least -0.50 D in either eye) followed by Hyperopia (+2.00 D or more) and Astigmatism (cylinder of > or = 0.75 D).

This study results were comparable with the study conducted by Rai et al. in Rupandehi district Nepal on primary school children which concluded that the commonest refractive error among school children was astigmatism, followed by myopia (26%) and then hypermetropia (19%).⁹ Pavithra et al. in Bangalore,¹⁰ Sethi S et al. among school children of Ahmedabad,¹¹ and S Matta et al. among the adolescents attending outpatient department of ophthalmology in New Delhi,¹² concluded that myopia was the most common refractive error among school children followed by astigmatism and hypermetropia. Medi K et al. in Kampala district concluded that the commonest refractive error was astigmatism (52%), followed by hypermetropia (37%) and myopia (11%).¹³ In a study of refractive error in southern china He M et al concluded that most common refractive error was myopia, followed by astigmatism and

hyperopia.

In this study, out of 221 myopic, 101(46%) were diagnosed as low degree myopia with male gender predominance in 11-15 yrs compared to 10yrs group (Figures 2 and 3 and Table 4). 113 students were falling under category of >15yrs and was found that with increasing age its ratio compared to other refractive error was more, which was comparable with other studies Andhra Pradesh¹⁴ and Kolkata.¹⁵

Approximately 30(13.5%) students were having high myopia among which 15(50%) were having lattice degeneration and 4 required barrage treatment to prevent retinal tear. 78(35.3%) students were having myopic crescent with tigroid appearance.

198(89.6%) students were having best corrected vision 6/6 after prescribing glasses. Children from families led by parents with higher levels of educational attainment, and probably greater resources, may experience more pressure to study, entailing near work, which in turn could cause the onset of myopia.

As compared to other study In this study, out of 58(18.8%) hyperopic students, 32(51.2%) students were falling under 10 years group as in this age period, there is increase in axial length of eyeballs occurs which can lead to myopic shift (Figure 4). Female gender predominance were observed in this study (Figure 2). It was comparable with other studies in many previous studies conducted in New Delhi,¹⁶ Bangalore.¹⁰ 30(51.8%) students were having 2-4D which was associated with asthenopic symptoms and symptoms were relieved after correcting refractive errors by giving spectacles.

Children with moderate to high hyperopia is more likely to develop accommodative esotropia and approx. 2 children in this study were diagnosed with it and after given acceptable refractive error and on follow up it was found that there is decrease in degree of strabismus. Amblyopia can be another complication of hyperopia.⁸

Out of 30 astigmatism error students, 12(40%) students were having low degree of astigmatic error with 18(60%) students had with rule astigmatism, 10(33.3%) students were given against rule astigmatism and 2(6.7%) students were found to be oblique astigmatisms (Figure 5). Myopic astigmatism 20(66.7%) were more common than hyperopic astigmatism. This study was comparable with results of Visual impairment in school children in Southern India by V Kalikivayi et al.¹⁴

10 (2.9%) students in our study were amblyopic. Amblyopia treatment is most effective when done early in the child's life, as it is plasticity period for children visual development before the age of seven.¹⁴ School screening is the best way to detect amblyopia and treat such children

5. Conclusion

Blindness due to refractive error is a substantial public health problem in developing world. Its presence implies

inadequate eye care services in school health programme hence it requires integrated system with adequate numbers of personnel be trained to carry out reasonable-quality refraction, provision of affordable reasonable-quality spectacles. It casues significant impact on child's life in terms of education, development, economic burden on society.

There was benefit of spectacles in 80% of those who had BCVA of 6/12 or worse. VISION 2020, also emphasized on immediate action needed to achieve goal "RIGHT TO SIGHT" by correcting refractive errors and reducing avoidable blindness by developing effective strategies against it.

6. Source of Funding

None.

7. Conflict of Interest

None.

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