

Analysis of Refractive Error Pattern in School Children in South Tamil Nadu

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Abstract

Background: Refractive error is one of the avoidable causes of blindness and low vision. It can restrict progress in education, limit career opportunity, and restrict access to information. Hence, it is essential to understand the pattern of refractive error in school children to plan the effective programs to deal with the problem.

Aim: To assess the pattern of the prevalence of refractive error in school going children. To attend the deviation from emmetropic status in the earliest possible time. Early diagnosis and treatment by mass screening and disability limitation were the prima foci of this study.

Materials and Methods: A total of 1000 students were examined from June 2015 to October 2015 in Theni District in South Tamil Nadu, India. Anterior segment examination was conducted with oblique illumination. Uncorrected, presenting and best-corrected visual acuity was assessed in internally illuminated Snellen's vision chart. Extraocular movements and cover tests were performed using torch light, and retinoscopy and subjective refraction were performed in all the children with an auto refractometer. Fundus evaluation was done with a direct ophthalmoscope.

Results: A total of 1000 students were enrolled. Of them, 524 students were male and 476 were female students. Around 54.10% students were emmetropic. Remaining 45.90% were diagnosed to have a refractive error with distribution as follows: Myopic astigmatism 26%, simple myopia 14.7%, simple hyperopia 14.7%, hyperopia with astigmatism 1.1%, and 1.4% were refractive to glasses.

Conclusion: Clinical evidence suggests that refractive error, including amblyopia and strabismus, is common ophthalmic disorders in children. Refractive error, particularly myopia, plays a substantial burden on the individual and on society. Myopia can have a potential negative impact on career choice, ocular health, and sometimes self-esteem. School-age children constitute a particularly vulnerable group, where uncorrected. Refractive error may have a dramatic impact on learning capability and educational potential.

Key words: Disability, Mass screening, Refractive error

INTRODUCTION

Refractive errors are optical defects of the eye wherein the incident parallel rays of light are not brought to a sharp focus by the cornea and the lens onto the light-sensitive layer of the retina.

According to the World Health Organization, 1.2 million children aged between 5 and 15 years are visually impaired because of uncorrected refractive errors.

Children with these problems need to be identified as early as possible because a delay in the treatment can lead to amblyopia.¹ It also has serious social implications for the child in the school.

MATERIALS AND METHODS

A total of 1000 students were examined from June 2015 to October 2015 in Theni District in South Tamil Nadu, India.

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Anterior segment examination was conducted with oblique illumination. Uncorrected, presenting and best-corrected visual acuity was assessed in internally illuminated Snellen's vision chart. Extraocular movements and cover tests were performed using torch light, and retinoscopy and subjective refraction were performed in all the children with an auto refractometer. Fundus evaluation was done with a direct ophthalmoscope.

Assessment of Refractive Status

A methodical evaluation of the anterior segment was done with oblique illumination.

- Uncorrected, presenting and best-corrected visual acuity was assessed with internally illuminated Snellen's vision chart,
- Extraocular movements and cover tests were performed using torch light, and,
- Retinoscopy and subjective refraction were performed in all children with an auto refractometer,
- Detailed posterior segment evaluation was done with a direct ophthalmoscope.

RESULTS

This study included 1000 students in Theni District. Of them, 524 students were male and 476 students were female (Chart 1). Because we analyzed school going children, the age group was between 5 and 15 years. 571 students were in the age group of 5-10 years and 429 students were in the age group of 10-15 years (Table 1).

About 54.10% of students were emmetropic, and remaining 45.90% were diagnosed to have refractive error with a distribution as follows: Myopic astigmatism: 26.1%, simple myopia: 14.7%, simple hypermetropia: 1.4%, hypermetropia with astigmatism and mixed astigmatism: 1.1%.² Few myopes (1.4%) were refractory to glasses (Table 2 and Chart 2).

These refractive errors were corrected by glass prescription and importance of compliance was explained to the teacher and the student. Refractory cases (1.4%) underwent fundus examination to look into the other causes of retarded visual acuity,

DISCUSSION

- The results of this study are on a high note to the study carried out by Sethi and Kartha (2003).³ A study of the prevalence of refractive errors in school children aged between 12 and 17 years was conducted by them in Ahmedabad. The results were that 25.32% of the students included in the study had refractive errors.

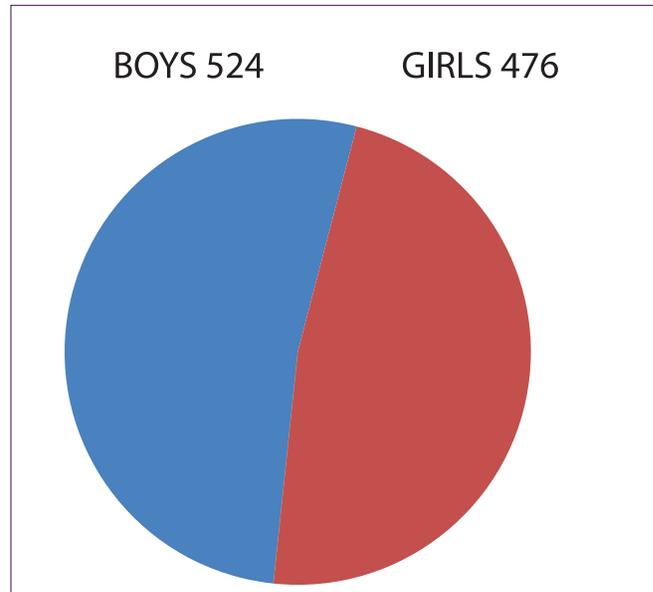


Chart 1: Sex distribution

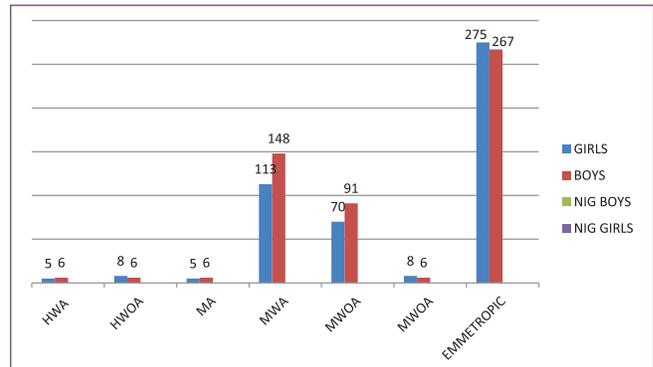


Chart 2: Sex distribution interposed with refractive error pattern

Table 1: Age distribution

Age (years)	Frequency (%)
5-10	571 (57.10)
11-15	429 (42.90)
Total	1000 (100.00)

Table 2: Pattern of refractive error

Pattern	Frequency (%)
Asymmetrical (simple/astigmatism)	63 (6.30)
Emmetropia	541 (54.10)
Symmetrical (simple/simple astigmatic/astigmatic)	396 (39.60)
Total	1000 (100.00)

- Seema *et al.* (2004)⁴ conducted a similar study on the magnitude of refractive errors in school children in a rural block of Haryana. In this study which included 1265 students 172 (13.6%) children were found to have a visual defect.

- In Prema *et al.*,⁵ the results of this study showed that 30.57% of students were identified as having defective vision. Out of which 43.75% are boys and 56.25% are girls. There was a significant difference in their residential area; that is 27.08% were in the rural area, 34.37% were from the urban area, and 38.55% were residing in the semi-urban area. The students and their parents were not aware of complications such as amblyopia which could be caused by uncorrected refractive errors.

CONCLUSION

This study shows that most of the children or the parents are unaware of the refractive errors. Therefore, screening in school and pre-school should be carried out periodically.

- Furthermore, school going children and their parents should be educated about signs and symptoms of refractive errors, ocular hygiene and the risk factors

involved in the development of these, and other pathological problems.

- The data support the assumption that vision screening of school children in developing countries could be useful in detecting curable causes of vision problems provided detected at the early stage especially refractive errors by which long-term visual disability could be avoided.

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