

# Magnitude of refractive errors among children in urban and rural areas of Ahmedabad district

Ashish S Chaudhari<sup>1</sup>, Sohil H Mansuri<sup>2</sup>, Anoop Singh D Rajput<sup>2</sup>, Niti J Talsania<sup>2</sup>

<sup>1</sup>Department of Community Medicine, Pacific Medical College and Hospital, Udaipur, Rajasthan, India.

<sup>2</sup>Department of Community Medicine, BJ Medical College, Ahmedabad, Gujarat, India.

Correspondence to: Ashish S Chaudhari, E-mail: ashishchaudhari3737@gmail.com

Received October 20, 2015. Accepted November 9, 2015

## Abstract

**Background:** The number of people worldwide with refractive errors has been expected from 800 million to 2.3 billion. Refractive error as a cause for blindness has not received much attention, because several explanations of blindness have been established on best-corrected distance visual acuity, including the definition used in the International Statistical Classification of Diseases and Related Health Problems. So, this study was conducted to study the occurrence of eye problems.

**Objective:** To study the occurrence of eye problems such as refractory error among children of 10–18 years in urban and rural areas of Ahmedabad district and provide epidemiological data, appropriate suggestions, and recommendations for National Health Programs of Adolescent.

**Materials and Methods:** This cross-sectional study was conducted among 1,032 urban and 1,043 rural children of 10–18 years of age during the period December 2012–December 2014.

**Result:** In this study, refractory error was found among 7.28% of children. The occurrence of refractory error was found to be 8.53% among urban children when compared with 6.04% among rural children.

**Conclusion:** Refractory error was found higher among urban children when compared with rural children. Statistical difference was found significant. It was found much higher among schoolchildren when compared with nonschoolchildren.

**KEY WORDS:** Occurrence, squint, ocular morbidity

## Introduction

According to the WHO statistics, there were 0.7 million of the world's blind children living in Southeast Asia region.<sup>[1-3]</sup> Blindness is one of the most significant social problems in India. National Program for Control of Blindness (NPCB) was launched in the year 1976 as a 100% centrally sponsored scheme, with the goal to reduce the prevalence of blindness from 1.4% to 0.3%. As per survey in 2001–2002,

prevalence of blindness is estimated to be 1.1%. Rapid Survey on Avoidable Blindness conducted under NPCB during 2006–2007 showed a decline in the occurrence of blindness from 1.1% (2001–2002) to 1% (2006–2007). Numerous accomplishments/initiatives are going to achieve the objective of decreasing the occurrence of blindness to 0.3% by the year 2020 under NPCB during the Five Year Plans. A national survey on blindness 2001–2002 showed that 7% of children aged 10–14 years presented difficulties with their eye sight. Refractive errors are common in children, the commonest cause of visual impairment around the world, and the second leading cause of treatable blindness. Reduced vision in childhood affects performance in school or at work and creates a negative impact on the future life of the child. The WHO suggests incorporation of vision screening and refractive services for school students within screening for other health problems. Visual impairment is a socioeconomic problem prevalent all over the world. In developing countries

### Access this article online

Website: <http://www.ijmsph.com>

DOI: 10.5455/ijmsph.2016.20102015232

Quick Response Code:



International Journal of Medical Science and Public Health Online 2016. © 2016 Ashish S Chaudhari. This is an Open Access article distributed under the terms of the Creative Commons Attribution 4.0 International License (<http://creativecommons.org/licenses/by/4.0/>), allowing third parties to copy and redistribute the material in any medium or format and to remix, transform, and build upon the material for any purpose, even commercially, provided the original work is properly cited and states its license.

such as India, problem is more complicated because of the combined effects of poverty, illiteracy, and lack of medical facilities.

## Materials and Methods

This cross-sectional study "Magnitude of refractive errors among children in urban and rural areas of Ahmedabad district" was carried out in urban and rural areas of the Ahmedabad during the period December 2012–December 2014. This study was conducted among 1,032 urban children of 10–18 years of age. In rural area, there were 1,043 children. It compared of school-going and nonschool-going children. Informed consent was taken from the school principal in school-going children and from the parent/guardian in case of nonschool-going children. All participants were assessed including those not wearing or wearing glasses for refractive error correction. A Snellen's chart was used to assess the visual acuity of study participants at a distance of six meters. Moderate visual impairment was defined by the WHO as a presenting visual acuity <6/18 but >6/60 in the better eye.<sup>[4]</sup> Data entry was done in Microsoft Office Access Database, and analysis was done by Epi Info 3.5.1. The  $\chi^2$ -test was used for comparison of frequency. A *P* value below or equal to 0.05 was considered to be statistically significant for a 95% confidence Interval.

## Result

This study was conducted in urban and rural areas of Ahmedabad district. In urban and rural areas, there were 1,032 and 1,043 children, respectively.

Table 1 shows that, overall, 182 (8.78%) children were found with eye problems. The occurrence of refractive error was found to be 88 (8.53%) among urban children when compared with 63 (6.04%) among rural children. Statistic difference for refractive error among urban and rural children was found to be significant ( $\chi^2 = 4.75$ , *df* = 1, *p* < 0.05).

Of 1,378 school-going children studied, 142 (10.30%) showed eye problems. Refractive error was commonest in 124 children of 142 (87.32%) children. Of 697 nonschool-going children studied, 40 (5.74%) showed eye problems. Refractive error was commonest in 27 of these 40 children (67.50%). Among overall children studied, refractive error was seen in 151 (7.28%) of children. This was followed by conjunctivitis among 31 (1.49%) children and squint in 17 (0.82%). Statistic difference for refractive error among school-going and nonschool-going children was found to be highly significant (Yates correction  $\chi^2 = 17.2$ , *df* = 1, *p* < 0.001).

## Discussion

Although vision is very important to people of all ages, it is more so in children and adolescents as it has a key role in their mental, physical, and psychological developments. Most of adult blindness is easily treatable and preventable; however, if it is not detected and prevented in time, it may lead to a permanent disability. Among the overall children in the study, refractive error was seen in 7.28% of children. The occurrence of refractive error was found to be 8.53% among urban children when compared with 6.04% among rural children. The prevalence of ocular morbidity among schoolchildren (9.00%) was higher than nonschoolchildren (3.87%). Occurrence of conjunctivitis was found to be in 31 (1.49%) children, followed by squint in 17 (0.82%).

Almost similar findings were found in study conducted by Kamath *et al.*,<sup>[5]</sup> in which they have found the prevalence of refractive error as 5.6% among school-going children of rural area in Karnataka.

Higher prevalence was found in several studies. Study conducted by Prakash *et al.*<sup>[6]</sup> revealed the prevalence of 13% (7.8% in boys, 5.6% in girls) among school adolescents of Gandhinagar district, Gujarat. Urmil *et al.*<sup>[7]</sup> reported an even higher prevalence of ocular morbidity for boys (38.5%) and

**Table 1:** Distribution of the schoolchildren and nonschoolchildren according to the presence of eye problems in urban and rural areas of Ahmedabad district

Eye problems	Urban		Test	Rural		Test	Total
	School	Nonschool		School	Non School		
Normal	606 (88.34)	325 (93.93)		630 (91.04)	332 (94.59)		1893 (91.22)
Conjunctivitis	7 (1.02)	6 (1.73)	Yates corr. $\chi^2 = 0.45$ , <i>df</i> = 1, <i>p</i> > 0.05	11 (1.59)	7 (1.99)	Yates corr. $\chi^2 = 0.63$ , <i>df</i> = 1, <i>p</i> > 0.05	31 (1.49)
Refractive error	72 (10.49)	16 (4.62)	Yates corr. $\chi^2 = 9.45$ , <i>df</i> = 1, <i>p</i> < 0.05	52 (7.51)	11 (3.13)	Yates corr. $\chi^2 = 7.1$ , <i>df</i> = 1, <i>p</i> < 0.05	151 (7.28)
Squint	4 (0.59)	3 (0.88)	Yates corr. $\chi^2 = 0.01$ , <i>df</i> = 1, <i>p</i> > 0.05	6 (0.88)	4 (1.13)	Yates corr. $\chi^2 = 0.009$ , <i>df</i> = 1, <i>p</i> > 0.05	17 (0.82)
Total	686	346		692	351		2,075

Figures in parentheses denote percentage distribution.

girls (28.6%) in schoolchildren in Pune during 1988. Seema et al.<sup>[8]</sup> found the refractive error was 13 % among schoolchildren in rural block of Haryana. Datta et al.<sup>[9]</sup> found the prevalence of 21.19% refractive error among adolescent schoolchildren in Pune. In the study conducted by Bhagwati et al.<sup>[10]</sup> also refractive error was the commonest eye problem in both boys (17.8%) and girls (12.8%). Study conducted by Basu et al.<sup>[11]</sup> among urban female school students of Surat found prevalence of refractive error to be 15.22%, which was much higher almost double from this study. Lower prevalence of ocular morbidity in this study compared with previous studies may be owing to improved living conditions compared to past, with better availability of health services.

## Conclusion

Refractive error was found higher among urban children when compared with rural children. Statistic difference was found significant. It was found much higher among schoolchildren when compare with nonschoolchildren. Statistic difference for refractive error among school-going and non-school-going children was found to be highly significant.

## References

1. Dunaway D, Berger I. Worldwide distribution of visual refractive errors and what to expect at a particular location. Presentation to the International Society for Geographic and Epidemiologic Ophthalmology, InFOCUS Center for Primary Eye Care Development. Available at: <http://www.infocusonline.org/WORLDWIDE%20DISTRIBUTION%20OF%20VISUAL%20REFRACTIVE%20ERRORS1.doc> (last accessed on August 18, 2015).
2. World Health Organization. *International Statistical Classification of Diseases and Related Health Problems: Tenth Revision*. Geneva: WHO, 1992. pp. 456–7.
3. World Health Organization. *Health situation in the South-East Asia Region 1998-2000*. New Delhi: WHO, 2000.
4. World Health Organization. *International Statistical Classification of Diseases and Related Health Problems. 10th Revision*. Current version. Version for 2003. Chapter VII. H54. Blindness and low vision. Geneva: WHO.
5. Kamath BTP, Prasad BSG, Deepthi R, Muninrayana C. Prevalence of ocular morbidity among school going children (6–15 years) in rural area of Karnataka, South India. *Int J Pharm Biomed Res* 2012;3(4):209–12.
6. Prakash P, Jaydeep O, Prajapati J, Kedia G, Chudasama RK. Prevalence of ocular morbidity among school adolescents of Gandhinagar district, Gujarat. *Online J Health Allied Sci* 2010;9(4):102–3.
7. Urmil AC, Dutta PK, Ahmed KA, Ghosh AK. A prevalence study of eye diseases among children in a school of Pune. *Indian J Community Med* 1988;13(3):134–41.
8. Seema S, Vashishth BM, Meenakshi K, Manish G. Magnitude of refractive errors among school children in a rural block of Haryana. *Internet J Epidemiol* 2009;6(2):5.
9. Datta CA, Bhardwaj Lt N, Patrikar SR, Bhalwar CR. Study of disorders of visual acuity among adolescent school children in Pune. *MJAFI* 2009;65(1):26–9.
10. Bhagwati S, Kulkarni N, Raje S, Prayag RD. Some neglected aspects of school health checkups. *Indian J Community Med* 2004;29:125–7.
11. Basu M, Das P, Pal R, Kar S, Desai VK, Kavishwar A. Spectrum of visual impairment among urban female school students of Surat. *Indian J Ophthalmol* 2011;59(6):475–9.

**How to cite this article:** Chaudhari AS, Mansuri SH, Rajput AD, Talsania NJ. Magnitude of refractive errors among children in urban and rural areas of Ahmedabad district. *Int J Med Sci Public Health* 2016;5:1457-1459

**Source of Support:** Nil, **Conflict of Interest:** None declared.