

Pattern of Ocular Morbidity in School Going Children

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ABSTRACT

BACKGROUND

We wanted to determine the prevalence of ocular morbidity among school going children between ages of 6 and 16 yrs. in public schools of urban and rural areas of Kanpur city and study its pattern.

METHODS

A cross-sectional prospective study was done among a total of 2105 school going children (rural - 956 and urban -1149), 6-16 years of age in rural and urban areas of Kanpur city. A comprehensive ocular examination was done with the help of torch light, slit lamp and +90 D and direct ophthalmoscope to examine the anterior & posterior segment pathologies.

RESULTS

Ocular morbidity in the rural population was 817 (no. of diagnosed cases) of which 43.30 % were in rural areas of which 63.52 % were males. 35.07 % were in urban areas of which 57.81 % were males. The most common type of ocular morbidity in rural population was refractive error (15.9 %), followed by vitamin A deficiency (12.86 %), blepharitis (5.43 %), squint (3.66 %), amblyopia (2.87 %), stye (2.40 %), ptosis (1.67%), colour blindness (1.15 %), and posterior segment pathologies (0.19 %).in urban areas, the most common cause was refractive error (26.19 %), followed by squint (2.78 %), amblyopia (1.91 %), vitamin A deficiency (1.91 %), blepharitis (1.83 %), colour blindness (1.21 %), stye (0.70 %), ptosis (0.35 %) and posterior segment pathologies (0.08 %). The difference was statistically extremely significant with $p = 0.0001$.

CONCLUSIONS

Refractive error was the most common ocular morbidity in both urban and rural areas, but Vitamin A deficiency and blepharitis were more common in rural areas. In rural areas malnutrition seems to be the major cause of ocular morbidity while more use of gadgets and less outdoor activity seems to play vital role in urban areas.

KEY WORDS

Ocular Morbidity, Refractory Errors, Squint, Amblyopia, Vit. A Deficiency

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BACKGROUND

Blindness is one of the significant social problems in India.¹ In India total child population in 2010 was 345 million and number of blind children was 2, 80,000. The prevalence of blindness declined to 1.4 % than previous data after vision 2020.² Childhood eye morbidity is defined as "Any eye disease or condition that requires ophthalmic care and treatment which if untreated can often progress to serious and sight threatening disease."³ Ocular morbidities include refractive errors, vitamin A deficiency, conjunctivitis, trachoma, ocular trauma, blepharitis, stye, chalazion, cataract, squint, corneal diseases, congenital disorder, colour blindness, pterygium and posterior segment pathologies.

According to the pattern of ocular diseases varies in different part of the world and is influenced by racial, geographic, socioeconomic and cultural factors. The rate of infection and complication are influenced by a number of socio-economic and socio-cultural factors and season. Children do not complain of defective vision and may not even be aware of their problem. They adjust to the poor eye sight by sitting near the blackboard, holding the books closer to their eyes, squeezing the eyes and even avoiding work requiring visual concentration. This warrants early detection and treatment to prevent permanent disability. Children in the school-going age group (6-16 years) represent 25 % of the population in the developing countries. They offer significantly representative material for these studies as they fall best in the preventable blindness age group, are a controlled population i.e. they belong to a certain age group and are easily accessible and schools are the best forum for imparting health education to the children. Schools are also one of the best centres for effectively implementing the comprehensive eye healthcare programme.⁴

A study of the pattern of ocular diseases in children is very important because while some eye conditions are just causes of ocular morbidity, others invariably lead to blindness. It is estimated that the cumulative number of blind - person-years worldwide due to childhood blindness ranks second only after the cumulative number of blind-person-years due to cataract blindness.⁵ Considering the fact that 30% of India's blind lose their eyesight before the age of 20 years and many of them are under five when they become blind, the importance of early detection and treatment of ocular disease and visual impairment among young children is obvious.⁶

There are data available on prevalence of ocular morbidity in school going children in developing countries. Many initiatives have been taken at our tertiary care centre for e.g. school to school screening and counselling, school health programme etc. We actively participate under various programs of vision 2020 and NPCB. With this background, the present study was conducted with the objective to determine the pattern and prevalence of ocular morbidity among the children attending school in the district of Kanpur (U.P.) and also compares the prevalence of ocular diseases in children of government schools and private schools, rural and urban locality.

We wanted to study the pattern of ocular morbidity among school going children in the age group of 6 - 16 yrs. in public schools in urban and rural areas of Kanpur city.

METHODS

A cross-sectional prospective study was done among 2105 school going children (rural - 956 and urban -1149) of age 6-16 years, in rural and urban areas of Kanpur city over a period of 1 year. The students were screened with the help of Snellen's, E-chart, Ishihara chart. Any child having visual acuity of 6/9 or worse improving with the pinhole was examined for refractive error. Any child of vision $\leq 6 / 12$ not improving with pin hole was undergone retinoscopy followed by subjective refraction at LLRH hospital, Kanpur. Simple corneal light reflex, ocular movements, cover- uncover, test was done for detection of squint. A comprehensive ocular examination was done with the help of Torch light, Slit lamp and 90D and direct ophthalmoscope to examine the anterior and posterior segment pathologies.

All the children between 6-16 yrs. of age in the selected schools was examined for ocular morbidity. Prevalence of ocular morbidity like refractive errors, vitamin A deficiency, trachoma, ocular trauma, blepharitis, stye, conjunctivitis, chalazion, cataract, squint, corneal diseases, congenital disorder, colour blindness, pterygium, amblyopia and posterior segment pathologies.

Statistical Analysis

Data was analysed using Statistical Package for the Social Sciences (SPSS) Version 19. Comparison of the discrete variables were evaluated and significance was shown as p value ($p < 0.05$) by using Fischer's Exact Test.

RESULTS

Type of Ocular Morbidity	Urban Area (n = 1149)	Rural Area (n = 956)	P Value
Refractive errors	301 (26.19 %)	152 (15.9 %)	< 0.0001
squint	32 (2.78 %)	35 (3.66 %)	= 0.3190
Vitamin A deficiency	22 (1.91 %)	123 (12.86 %)	< 0.0001
Blepharitis	21 (1.83 %)	52 (5.43 %)	< 0.0001
Stye	8 (0.70 %)	23 (2.40 %)	= 0.0017
Colour blindness	14 (1.21 %)	11 (1.15 %)	= 1.000
Ptosis	4 (0.35 %)	16 (1.67 %)	= 0.0025

Table 1. Prevalence of Different Types of Ocular Morbidity in School Going Children Aged 6-16 Years in Rural and Urban Areas

Type of Ocular Morbidity	Males (n = 595)	Females (n = 361)
Refractive errors	97 (16.03 %)	55 (15.23 %)
squint	22 (3.69 %)	13 (3.60 %)
Vitamin A deficiency	73 (12.26 %)	50 (13.85 %)
Blepharitis	37 (6.21 %)	15 (4.15 %)
Stye	16 (2.68 %)	7 (1.93 %)
Colour blindness	8 (1.34 %)	3 (2.21 %)
Ptosis	8 (1.34 %)	8 (0.83 %)
Posterior segment pathologies	2 (0.33 %)	0

Table 2. Sex Wise Distribution of Ocular Morbidity in Rural School Children

The overall prevalence of ocular morbidity was found to be 81 %. Overall Prevalence of ocular morbidity in school going children age 6 - 16 years in rural and urban areas was 38.81 %. In urban area the most common refractive error was myopia (13.23 %) followed by compound astigmatism (5.74 %), simple astigmatism (3.65 %), hypermetropia and least mixed astigmatism (0.35 %). The prevalence of refractive error in rural area was 15.9 % in which myopia (7.32 %)

followed by compound astigmatism (3.66 %), simple astigmatism (2.56 %), hypermetropia (2.24 %) and mixed astigmatism (0.10 %). In study prevalence of ocular morbidity in students was 11.58 %. The prevalence was more in Municipal Corporation School (7.35 %) while in Private English medium school it was 4.24% amongst total Students.⁷

Type of Ocular Morbidity	Males (n = 696)	Females (n = 453)
Refractive errors	170 (24.42 %)	131 (28.91 %)
squint	16 (2.29 %)	16 (3.53 %)
Vitamin A deficiency	14 (2.01 %)	8 (1.76 %)
Blepharitis	13 (1.86 %)	8 (1.76 %)
Stye	4 (0.57 %)	4 (0.88 %)
Colour blindness	13 (1.86 %)	1 (0.22 %)
Ptosis	3 (0.43 %)	1 (0.22 %)
Posterior segment pathologies	0	1 (0.22 %)
	233 (33.47 %)	170 (37.2 %)

Table 3. Sex Wise Distribution of Ocular Morbidity In Urban School Children

Types of Refractive Error	No.	% Out of Total (Prevalence)
Myopia	152	13.23
Hypermetropia	37	3.22
Simple astigmatism	42	3.65
Compound astigmatism	66	5.74
Mixed astigmatism	4	0.35
Total	301	26.19

Table 4. Prevalence of Types of Refractive Error In Urban Population (n=1149)

Types of Refractive Error	No.	% Out of Total (Prevalence)
Myopia	70	7.32
Hypermetropia	21	2.24
Simple astigmatism	25	2.56
Compound astigmatism	35	3.66
Mixed astigmatism	1	0.10
Total	152	15.9

Table 5. Prevalence of Types of Refractive Error In Rural Population (n = 956)

DISCUSSION

The present prospective study was done among a total of 2105 school going children of age 6 - 16 years in rural and urban areas of Kanpur city to determine the prevalence of ocular morbidity in school going children along with its correlation with age and sex.

From this study it was seen that the overall prevalence of ocular morbidity in the school children ages 6-16 yrs. of rural and urban areas of Kanpur city was 38.82 % i.e. 817 out of 2105. In rural area 414 and in urban area 403 were diagnosed as ocular morbidity. Thus, the prevalence in rural area 43.30 % was much higher than that of urban area 35.07 % and it was statistically extremely significance p = 0.0001.

Various other studies in India showed higher prevalence like Rajesh Kumar et al.⁸ In their study observe that the prevalence of ocular morbidity was 24.6 %. Madhu Gupta, Bhupinder P Gupta et al⁴ observed that the overall prevalence of ocular morbidity among school children of age 6-16 years was 31.6 %. Higher prevalence of ocular morbidity was seen in the study at Kathmandu valley, Nepal by Rajesh Kishore Shrestha, et al¹¹ as 34.2 % in age group of 5-16 years. But lower prevalence of 19.9 % was seen by Ayanniyi A et al.¹² Study done on 277 pupils at Ilorin. Similar results were also seen in study by Deshpande Jayant D et al¹⁰ showing 27.65 % as ocular morbidity.

Refractive Error

Among ocular morbidity refractive error was the most common cause in both the rural and urban children. The prevalence of refractive error in urban children (26.19 %) was much higher and statistically significant (p < 0.0001) than the rural children (15.9 %). Females were affected more in urban areas along with higher percentage of refractive error seen in age group 11-16 years.

In refractive errors of urban school children myopia was most common (13.23 %) followed by compound astigmatism (5.74 %), simple astigmatism (3.65 %), hypermetropia (3.22 %) with least of mixed astigmatism (0.35 %). The same pattern followed in rural children also with myopia being the most common (7.32 %) followed by compound astigmatism (3.66 %) and mixed astigmatism being the least one (0.10 %).

Hypermetropia was more common in age group 6-10 yrs. Similar results was seen in study conducted by Naik Ret al¹³ who found Refractive errors (7.57 %) constitute the major cause of ocular morbidity, myopia being the commonest refractive error. In study done by Ghosh S, Mukhopadhyay U et al,¹⁴ Refractive error was seen in 14.7 %. Myopia and hypermetropia was present in 307 (11.9 %) and 65 (2.5 %) children, respectively.

A study by Dandona R, et al¹⁵ found that refractive error was the cause in 61% of the total eyes with visual impairment. A gradual shift to lesser positive values as age progresses was noted. Myopia was present in 4.1 % of the total value. Hypermetropia in 0.8 % of the total. 70 % of the children benefited from wearing spectacles. The results of the present study were quite similar to the study by Rajesh Kishore Shrestha, et al¹¹ that showed refractive error being the most common ocular morbidity (21.8 %).

Simple myopia (10.1 %) was the commonest followed by compound astigmatism (4.6 %) and the least common was mixed astigmatism (0.3%). Pavithra MB et al¹⁶ found that prevalence of refractive error in age 7-15 years of school children was 7.03 %. Myopia being the most common (4.4 %), followed by astigmatism (1.6 %) and hypermetropia (1.03 %).

CONCLUSIONS

Refractive error was the most common ocular morbidity in both urban and rural areas, but Vitamin A deficiency and blepharitis were more common in rural areas. In rural areas malnutrition seems to be the major cause of ocular morbidity while more use of gadgets and less outdoor activity seems to play vital role in urban areas.

Improving the diet, hygiene and education in rural areas may help in decreasing the overall ocular morbidity in rural areas. Whereas, in urban areas increasing outdoor activities, proper reading habits and decrease in gadgets use may help in decreasing ocular morbidities in these areas.

Proper health education to parents as well as regular eye check-ups are essential to prevent and early diagnose ocular disease in children.

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