



PATTERN OF OCULAR MORBIDITIES - A CROSS SECTIONAL STUDY ON SCHOOL CHILDREN IN AMRITSAR, PUNJAB, NORTH INDIA.

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ABSTRACT

This study aims to evaluate the prevalence and to make a comparison between the ocular morbidity pattern in school going children of government and private schools of urban area of Amritsar. A school-based cross-sectional study design was adopted to examine children aged 5–15 years in randomly selected government and private schools of Amritsar. The prevalence of ocular morbidity was 18.92% (16.29% government, 21.05% private). Refractive errors showed a significantly higher prevalence ($P < 0.05$) in the private (19.94%) as compared to the government schools (14.91%). This study was the first of its kind in Amritsar, it revealed that refractive errors, Squint, spring catarrh, seborrhoeic blepharitis and styne are important causes of ocular morbidities. Refractive errors were most common ocular disorder. The majority of the causes are either treatable or preventable. Ongoing school health program should be strengthened to reduce the prevalence of visual impairment due to refractive errors.

KEYWORDS : ocular morbidity, prevalence, refractive errors, school children

INTRODUCTION:

Ocular morbidities mostly originate in childhood and if undetected may result in severe ocular disabilities affecting development and educational performance. Childhood blindness and visual impairment are important and perhaps most devastating and disabling than adult-onset blindness, because of long span of life still remaining to be lived. Vision is important special sense in human beings. The prevalence of childhood blindness in India is 0.17%.¹ Most of the cases of childhood blindness in the developing world are avoidable, preventable and treatable.² Treatable refractive error is the major cause of blindness in children in India followed by preventable causes like vitamin A deficiency and amblyopia.^{1,3}

Various studies from different parts of India have reported different patterns of ocular morbidity among children of school going age. In a study of urban school children of low-income families in Kolkata, refractive error was seen in 14.7%,⁴ whereas, a much higher prevalence of refractive error (47.91%) has been reported in children in a study conducted in Bhopal.⁵

School screening programme is an integral part of the National Program for Control of Blindness. Though many studies have been done in different parts of India but to the best of my knowledge no such study has been reported in the border belt region of Punjab. Hence, this study was conducted with the objective of estimating the prevalence and distribution of ocular morbidity among school children of government and private schools.

MATERIAL AND METHODS:

After taking permission from the institution committee the study was planned between April 2018 to April 2019. Three government and three private urban based schools were randomly selected in the border district of Punjab, North India. 2769 students from class one to eight and aged between six to fifteen years were enrolled.

The Principals of the selected schools were informed about the study and permission for the visit to the selected schools was sought.

The standard examination method was used for ocular examination. Visual acuity was measured with Snellen's chart at distance of 6 meters. External examination and anterior segment examination were done with pen torch and undilated posterior segment examination was done with direct ophthalmoscope. Dilated fundus examination was done in the selected cases. Extra ocular motility was recorded in nine positions. The cover test was used to assess the binocular vision function. Hirschberg's test was done to rule out squint. Alternate cover test was done to identify latent squint. The principal cause of ocular morbidity was assigned after completion of the ocular examination.

Ocular morbidity was defined as an abnormality in any of the ocular

structures, which may or may not require or improve with treatment. Visual acuity of $<6/9$ and improving with pinhole was considered to be refractive error. A probable diagnosis of amblyopia was made if vision was $<6/9$ which did not improve with pin hole and no organic lesion was detected after complete ocular examination. Vitamin A deficiency was considered by recording Bitot's spot, conjunctival xerosis, corneal xerosis and night blindness.

The collected data was thoroughly entered into Excel spreadsheets and analysis was carried out. Overall prevalence of ocular morbidity was calculated in percentage. The prevalence of ocular morbidity between two studies were compared using the p value and value of <0.05 was considered statistically significant.

RESULTS:

Total number of 2769 school going children aged between six to fifteen years were examined for ocular morbidity. 1240 children from the government and 1529 children from the private schools were examined. Male: Female ratio was 0.823 and 1.088 among children of government and private schools respectively.

Table 1: Demographic profile of the children

Age (years)	Total number of Children examined		Number of Children with ocular morbidity	
	Government	Private	Government	Private
6-9	402	504	42	82
9-12	415	517	78	121
12-15	423	508	82	119
Male	560	797	108	146
Female	680	732	94	176

The prevalence of ocular morbidity in either eye among total 2769 school children was found to be 18.92%. Refractive errors 490 (17.69%) constitute the major cause of ocular morbidity, followed by strabismus 9(0.32%), spring catarrh 5(0.18%), styne 4(0.14%), seborrhoeic blepharitis (0.14%) and conjunctivitis 3(0.10%). Amblyopia accounted for 3 cases (0.10%) with majority of being refractive in nature, while one child had strabismic amblyopia due to esotropia. Congenital disorders accounted for 3(0.10%) of the total cases, ptosis was observed in two children and one child had right nasolacrimal duct obstruction. One case of corneal opacity was seen in private school. There was no case of fundus pathology and whole globe anomaly. There was no blind child using criteria of best corrected visual acuity $<3/60$. Prevalence of ocular morbidity was significantly ($p < 0.05$) more among children of private schools 322(21.05%) as compared to children in government schools 202 (16.29%). Prevalence of refractive error 305(19.94%) and amblyopia 2(0.13%) was significantly more among students of private schools. There was no significant difference for rest of ocular morbidities among private and government schools. (Table 2)

Table 2: Prevalence of ocular morbidity in government and private schools

Ocular morbidity	Government Schools (n=1240)	Private Schools (n=1529)	Total (n=2769)	'p' value
Refractive Error	185(14.91)	305 (19.94)	490 (17.69)	0.0006
Squint	4(0.32)	5 (0.33)	9 (0.32)	0.96
Vitamin A deficiency	2(0.16)	0	2 (0.07)	0.118
Conjunctivitis	2 (0.16)	1 (0.06)	3 (0.10)	0.418
Spring Catarrh	3 (0.24)	2 (0.13)	5 (0.18)	0.496
Corneal Opacity	0	1 (0.06)	1 (0.03)	0.388
Congenital Disorder	2 (0.16)	1 (0.06)	3 (0.10)	0.418
Seborrhoeic blepharitis	0 (0.00)	4 (0.26)	4 (0.14)	0.072
Stye	3(0.24)	1(0.06)	4(0.14)	0.208
Amblyopia	1 (0.8)	2 (0.13)	3 (0.10)	0.007
Total	202(16.29)	322(21.05)	524(18.92)	0.001

Table 3: Age wise distribution of ocular morbidity in government and private schools.

Disease	Government Schools				Private Schools			
	6-9 n=402 %	9-12 n=415 %	12-15 n=423 %	p-value	6-9 n=504 %	9-12 n=517 %	12-15 n=508 %	p-value
Refractive Error	35 (8.70)	70 (16.86)	80 (18.91)	0.000	76 (15.07)	114 (22.05)	115 (22.6)	0.003
Squint	1 (0.24)	3(0.72)	0	0.173	2(0.39)	2(0.38)	1(0.19)	0.82
Vitamin A deficiency	1 (0.24)	1(0.24)	0	0.595	0	0	0	n/a
Conjunctivitis	1 (0.24)	1(0.24)	0	0.595	1(0.19)	0	0	0.361
Spring Catarrh	2 (0.49)	0	1 (0.23)	0.351	2(0.39)	0	0	0.13
Corneal Opacity	0	0	0	n/a	0	1 (0.19)	0	0.375
Congenital Disorder	1 (0.24)	1(0.24)	0	0.595	1(0.19)	0	0	0.361
Seborrhoeic blepharitis	0	0	0	n/a	0	2 (0.38)	2(0.39)	0.373
Stye	1 (0.24)	2(0.48)	0	0.365	0	1 (0.19)	0	0.375
Amblyopia	0	0	1 (0.23)	0.38	0	1 (0.19)	1(0.19)	0.611

The prevalence of refractive error increased significantly with age in both government and private schools.

Table 4: Sex wise distribution of ocular morbidity

Ocular morbidity	Sex		Total (n=2769)	'p' value
	Male (n=1357) (%)	Female (n=1412) (%)		
Refractive Error	236(17.39)	254(17.98)	490(17.69)	0.684
Squint	5(0.36)	4(0.28)	9(0.32)	0.709
Vitamin A deficiency	1(0.07)	1(0.07)	2(0.07)	1
Conjunctivitis	2(0.14)	1(0.07)	3(0.10)	0.568
Spring Catarrh	2(0.14)	3(0.21)	5(0.18)	0.66
Corneal Opacity	1(0.07)	0	1(0.03)	0.32
Congenital Disorder	1(0.07)	2(0.14)	3(0.10)	0.571
Seborrhoeic blepharitis	3(0.22)	1(0.07)	4(0.14)	0.297
Stye	2(0.14)	2(0.14)	4(0.14)	1
Amblyopia	1(0.07)	2(0.14)	3(0.10)	0.571
Total	254(18.71)	270(19.12)	524(18.92)	0.783

There was no significant difference in the prevalence of ocular diseases among male and female children in the present study.

DISCUSSION:

The prevalence of ocular morbidity was 18.92% among total number of school children in our study, which is similar to the study conducted by Agarwal et al., (21.2 %).⁶ Whereas, a study conducted by Gupta et

al., in Shimla reported higher prevalence of ocular morbidity (31.6%) among 6 to 16-year-old school children.⁷ This difference in the prevalence in their study may be due to different diagnostic criteria used, racial variation, life styles and living conditions.

Different patterns and prevalence of ocular morbidity have been reported from various studies in different parts of the world. In our study refractive error was found to be the most important cause of ocular morbidity accounting for 17.69%. Similarly, in a cross-sectional study conducted in west Uttar Pradesh refractive error was found to be the most important cause of ocular morbidity accounting for 17.36 % of the total students.⁸ The prevalence of squint (0.32%) was the second important cause of ocular morbidity after refractive error which is comparable to another study conducted by Gupta et al., where refractive error (22.0%) was found to be the most common ocular morbidity followed by squint (2.5%).⁷ Among the other disorders in this study spring catarrh accounted for 0.18%, stye for 0.14%, seborrhoeic blepharitis for 0.14% and conjunctivitis for 0.10% of the total ocular morbidities. Whereas, higher prevalence of conjunctivitis (5%) has been reported in study conducted by Desai et al...⁹ Variation in the prevalence of conjunctivitis can be explained by difference in socioeconomic status, personal hygiene of children and seasonal variation of occurrence of conjunctivitis.

In our study prevalence of refractive error increased significantly with age in both government and private schools. A study conducted in Kolkata also reported a similar increase in prevalence of refractive errors with increase of age, but it was not statistically significant (p>0.05).¹⁰

Higher prevalence of ocular morbidity among males (55.9%) as compared to females(44.4%) has been reported in a study conducted by Deshpande et al., as compared to no significant difference in the prevalence of ocular diseases seen among male (18.71%) and female(19.12%) children in the present study.¹¹ Higher prevalence of ocular morbidity among females (33.2%) as compared to males(27.7%) has been reported by Gupta et al., study.¹² The reason for this difference may result from difference in study population.

We found significant difference in overall prevalence of ocular diseases among children in government and private schools in our study, prevalence of ocular morbidity is higher in private schools (21.05%) as compared to government schools (16.29%). This result was comparable with Shrestha et al., who also reported that the prevalence of ocular morbidity among children of private schools (20.5%) is higher as compared to government schools (18.75 %).¹³ Whereas, a study from North India reported no significant difference in the overall prevalence of ocular morbidity in government and private schools.⁷ The significantly higher prevalence of refractive errors among the private schools (19.94%) as compared to government school (14.91%) in this study is similar to a cross-sectional study from western Nepal where a significantly higher refractive error was reported in private schools as compared to government school children and this has been attributed to the higher educational load in private schools.¹⁴

CONCLUSION:

Refractive error is the most common and significant cause of ocular morbidity in this study. Squint, spring catarrh, stye and seborrhoeic blepharitis are other important causes of ocular morbidity seen among school children. Majority of the causes in children are either treatable or preventable. Ongoing school health program should be strengthened to reduce the prevalence of visual impairment due to refractive errors. Information, Education and Communication (IEC) activities should be promoted regarding the common sign and symptoms of ocular disorders, ocular hygiene and health care.

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