SOCIO-DEMOGRAPHIC CORRELATES OF OCULAR MORBIDITY IN SCHOOL CHILDREN OF RURAL HARYANA

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ABSTRACT

BACKGROUND

Vision impairment and blindness in children are important because of their impact on the child's development, education, future work opportunities and quality of life. These negative effects are experienced throughout the child's life. It leads to serious social and economic burden to the family and the society.

This study was conducted with the objectives of estimating the prevalence of ocular problems among school going children in rural area and to study the association of ocular problem with socio-demographic factors.

MATERIALS AND METHODS

This cross-sectional study was done in Govt. Senior Secondary Schools of Block Lakhanmajra, Haryana. Out of 16 Govt. Senior Secondary Schools, 4 were randomly chosen. Students aged 6 - 15 years studying in class 1 to 10 were included in the study. Test performed were Visual acuity (Snellen's E-chart), Cover Test, Ocular motility and External examination by torch, lens and loupe and an interview was done on the basis of questionnaire. The findings of clinical examination were recorded on a pre-tested Performa. After collection, the whole data was compiled; analysed and appropriate statistical tests like simple proportions, chi-square (χ^2) test were applied.

RESULTS

Out of 1265 students 41.4% boys and 38.9% girls were suffering from one or more eye problems. Out of total 451 children (35.65%) were having one or more eye problems; however, the overall prevalence of ocular morbidity was found to be 39.9%. Defective vision was the commonest morbidity (13.6%) followed by squamous blepharitis (12.3%), vernal conjunctivitis (5.1%), conjunctivitis (4.7%), conjunctival xerosis (2.8%), squint (0.8%) and stye (0.7%). Defective vision was significantly associated with girls. Squamous blepharitis was significantly associated with boys. Except defective vision all diseases were more prevalent in boys. Eye problems were found to be more among students whose father and mother were illiterate. Association of vernal conjunctivitis with father's literacy was found to be significant.

CONCLUSION

Ocular disorders among school going children can be easily identified by regular eye screening programmes. Prompt treatment can protect the child from future complications and blindness. The eye health awareness among children and school teachers should be improved.

KEYWORDS

Socio-Demographic, Ocular Morbidities, Rural Area, School Children.

BACKGROUND

The eyes are nature's meticulously designed most valuable gift for mankind. Eyes act as our windows to the world. Vision contributes greatly to one's learning capacities right since childhood.[1] So it is important to take care of eyes during the development of a child. The eyes can perform their function well only if their growth and development is well established. It is therefore essential that the common afflictions of the eyes that cause visual impairment or loss of eyesight are possibly prevented and properly treated.[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]

Around 80% of all visual impairment can be prevented or cured and that about 90% of the World's visually impaired live in developing countries.[4]

Poor vision in childhood affects performance in school or at work and has a negative influence on the future life of the child.[5]

Most eye disorders do not manifest dramatic visual disability initially; hence, they may be detected at a late stage.

If the disease affects a single eye quite often the patient is unaware of the defect until there is severe visual loss, so awareness programmes to educate the public regarding eye disorder is essential.[2]

With changing lifestyles eyes are under a lot of stress, younger children have much more to study. Increased use of computer, mobiles, long hours of television viewing and poor lighting all add to the problem.

Childhood blindness is a challenging problem in developing countries. In rural areas, neither the children nor the parents are intelligent enough to detect the eye problems and gradually these problems may result in blindness.

MATERIALS AND METHODS
The present cross-sectional study was carried out from September 2006 to July 2007 in Block Lakhanmajra, which is the field practice area attached to the Department of Community Medicine, Pt. B. D. Sharma Postgraduate Institute of Medical Sciences, Rohtak. The study subjects were school going children in the age group of 6 - 15 years. Out of total 16 Govt. schools existing in the block, two girls' schools and two boys' schools were randomly selected and all the students between 6 - 15 years of age, studying in class 1st to 10th were included in the study. The students were divided into three age groups: 6 - 10 years, 10 - 13 years and 13 - 15 years. All concerned Principals, Teachers and Students were briefed about the study. Each student was interviewed individually by the author in their local language, so that they can understand questions easily. The students present on day of visit were included in the study. No followup visits were done. The age of students was ascertained as per the school records. Visual Acuity (VA) test was performed using Snellen's E chart. If distant visual acuity was < 6/6, then those students were subjected to refraction by ophthalmic assistant. VA < 6/6 was taken as criteria of defective vision, because criterion of low vision according to WHO (VA ≤ 6/18 in better eye) is already grossly subnormal for school children.

Information was collected on a pre-tested semi-structured schedule. After collection, the whole data was compiled; analysed (SPSS-10) and appropriate statistical tests like percentages and chi-square (χ^2) tests were applied.

Inclusion Criteria
All the Children in the age group of 6 - 15 years in the selected schools.

Exclusion Criteria
Those who are not responding well and absentees on the day of examination.

RESULTS
Table I shows the distribution of different eye problems.

Table II shows most of the morbidities were found in oldest age group (13 - 15 yrs.), while least morbidities in the youngest age group (6 - 10 yrs.). Strong significant association was found with increase in age group in cases of defective vision* and xerosis*.

Table III shows that 41.4% boys and 38.9% girls were suffering from one or more eye problem. Defective vision* was significantly associated with girls. Squamous blepharitis* was significantly associated with boys. Except defective vision, all diseases were more prevalent in boys as compared to girls.

Table IV shows that out of all only conjunctival xerosis* was associated significantly with caste, it was more prevalent in scheduled caste students.

Table V shows that eye problems were found to be maximum among students whose father was illiterate as compared to those whose father was literate. Association of vernal conjunctivitis* with father's literacy was found to be significant.

Table VI shows that eye problems were found to be maximum among students whose mother was illiterate as compared to those whose mother was literate. Association of vernal conjunctivitis* with mother's literacy was found to be borderline significant.

Table VII shows that farming and labour were common occupation of the area. Maximum no. of eye problems were found in students, whose fathers were labourer. Association of individual problems was calculated, but no significant association found.

Eye Problems	Total n = 1265	Percentages [%]
Defective Vision	172	13.6
Squamous Blepharitis	156	12.3
Conjunctivitis	59	4.7
Vernal Conjunctivitis	64	5.1
Stye	9	0.7
Squint	10	0.8
Conjunctival Xerosis	35	2.8
Total	**505**	**39.9**

Table I. Prevalence of Eye Problems among Study Subjects

Age Groups	Eye Problems							Total [%]
	Defective Vision [%]	Squamous Blepharitis [%]	Conjunctivitis [%]	Vernal Conjunctivitis [%]	Stye [%]	Squint [%]	Conjunctival Xerosis [%]	
6 - 10 Years N = 282	14 [4.97]	36 [12.8]	10 [3.6]	14 [5.0]	3 [1.1]	5 [1.8]	1 [0.4]	83 [29.4]
10 - 13 Year N = 536	56 [10.45]	62 [11.6]	23 [4.3]	30 [5.6]	3 [0.6]	4 [0.75]	16 [2.99]	194 [36.2]
13 - 15 Years N = 447	102 [22.82]	58 [13]	26 [5.8]	20 [4.8]	3 [0.7]	1 [0.22]	18 [4.03]	228 [51]
Total N = 1265	172 [13.6]	156 [12.3]	59 [4.7]	64 [5.1]	9 [0.7]	10 [0.8]	35 [2.8]	505 [39.9]
χ2 Value (df- 2)	46.07	0.496	2.13	0.51	0.690	5.355	8.807	
P value	< 0.000*	0.78	> 0.10	0.50	0.70	0.07	0.012*	

Table II. Age Wise Distribution of Eye Problems

Eye Problems	Sex		Total [%] n = 1265	χ² Value (df-1)	P Value
	Boys [%] n = 510	Girls [%] n = 755			
Defective Vision	46 [9.02]	126 [16.69]	172 [13.6]	15.40	< 0.000*
Squamous Blepharitis	75 [14.7]	81 [10.7]	156 [12.3]	4.491	0.034*
Conjunctivitis	30 [5.9]	29 [3.8]	59 [4.7]	2.65	> 0.10
Vernal Conjunctivitis	33 [6.5]	31 [4.1]	64 [5.1]	3.35	> 0.05
Stye	4 [0.78]	5 [0.66]	9 [0.7]	0.064	0.80
Squint	5 [0.98]	5 [0.66]	10 [0.8]	0.393	0.531
Conjunctival Xerosis	18 [3.5]	17 [2.2]	35 [2.8]	1.858	0.173
Total	**211 [41.4]**	**294 [38.9]**	**505 [39.9]**		

Table III. Sex Wise Distribution of Eye Problems

Eye Problems	Caste			Total n = 1265 [%]	χ² (df-2)	p Value
	Backward Class n = 291 [%]	General Caste n = 551 [%]	Scheduled Caste n = 423 [%}			
Defective Vision	32 [11]	85 [15.4]	55 [13.0]	172 [13.6]	3.40	> 0.1
Squamous Blepharitis	36 [12.4]	68 [12.3]	52 [12.3]	156 [12.3]	0.001	1.00
Conjunctivitis	8 [2.8]	25 [4.5]	26 [6.2]	59 [4.7]	4.63	0.10
Vernal Conjunctivitis	15 [5.2]	28 [5.1]	21 [5.0]	64 [5.1]	0.02	> 0.50
Stye	1 [0.3]	5 [0.9]	3 [0.2]	9 [0.7]	0.852	0.653
Squint	0 [0.0]	5 [0.9]	5 [1.2]	10 [0.8]	3.249	0.197
Conjunctival Xerosis	9 [3.1]	8 [1.5]	18 [4.3]	35 [2.8]	7.166	0.028*
Total	**101 [34.7]**	**224 [40.7]**	**180 [42.6]**	**505 [39.9]**		

Table IV. Caste Wise Distribution of Eye Problems

Eye Problems	Father's Literacy					Total n = 1223 [%]	χ2 (df-4)	P Value
	Illiterate n = 257 [%]	Primary n = 193 [%]	Middle n = 270 [%]	Matric n = 349 [%]	≥Intermediate n = 154 [%]			
Defective Vision	36 [14]	28 [14.5]	40 [14.8]	39 [11.2]	19 [12.3]	162 [13.3]	4.78	0.869
Squamous Blepharitis	33 [12.8]	27 [14.4]	26 [9.6]	43 [12.3]	22 [14.3]	151 [12.4]	3.313	0.855
Conjunctivitis	11 [4.3]	5 [2.6]	16 [5.9]	17 [4.9]	7 [4.5]	56 [4.6]	3.34	> 0.1
Vernal Conjunctivitis	17 [6.6]	6 [3.1]	12 [4.4]	17 [4.9]	9 [5.8]	61 [4.9]	82.08	< 0.000*
Stye	4 [1.6]	2 [1.0]	0 [0]	3 [0.9]	0 [0]	9 [0.7]	6.349	0.50
Squint	2 [0.8]	0 [0]	3 [1.1]	3 [0.9]	2 [1.3]	10 [0.8]	2.793	0.903
Conjunctival Xerosis	11 [4.3]	8 [4.2]	4 [1.5]	11 [3.2]	0 [0]	34 [2.8]	9.886	0.1959
Total	**114 [44.4]**	**76 [39.4]**	**101 [37.4]**	**133 [38.1]**	**59 [38.3]**	**483 [39.6]**		

Table V. Father's Literacy in Relation to Eye Problems

Eye Problems	Mother's Literacy					Total n = 1254 [%]	χ² (df-4)	p Value
	Illiterate n = 656 [%]	Primary n = 292 [%]	Middle n = 163 [%]	Matric n = 105 [%]	≥ Intermediate n = 38 [%]			
Defective Vision	95 [14.5]	36 [12.3]	18 [11]	15 [14.3]	4 [10.5]	168 [13.4]	3.25	0.904
Squamous Blepharitis	75 [11.4]	33 [11.3]	24 [14.7]	13 [12.4]	8 [21.1]	153 [12.2]	6.098	0.297
Conjunctivitis	30 [4.6]	16 [5.5]	7 [4.3]	6 [5.7]	0 [0]	59 [4.7]	2.58	>0.50
Vernal Conjunctivitis	43 [6.6]	14 [4.8]	4 [2.5]	1 [0.9]	1 [2.6]	63 [5.0]	9.29	0.056*
Stye	5 [0.7]	2 [0.6]	1 [0.6]	1 [0.9]	0 [10]	9 [0.7]	0.495	0.992
Squint	6 [0.9]	3 [1.0]	1 [0.6]	0 [0]	0 [0]	10 [0.8]	1.641	0.896
Conjunctival Xerosis	23 [3.5]	8 [2.7]	0 [0]	2 [1.9]	1 [2.6]	34 [2.7]	7.652	0.176
Total	**277 [42.2]**	**112 [38.4]**	**55 [33.7]**	**38 [36.8]**	**14 [36.8]**	**486 [38.8]**		

Table VI. Mother's Literacy in Relation to Eye Problems

Eye Problems	Occupation						Total n = 1223 [%]	χ² (df-5)	P Value
	Farmer n = 437 [%]	Labourer n = 435 [%]	Shop Keeper n = 163 [%]	Govt. Job n = 71 [%]	Driver n = 41 [%]	Others n = 76 [%]			
Defective Vision	62 [14.2]	60 [13.8]	16 [9.8]	7 [9.9]	5 [12.2]	12 [15.8]	162 [13.3]	3.29	>0.50
Squamous Blepharitis	57 [13.0]	60 [13.8]	15 [3.1]	5 [7.0]	1 [2.4]	13 [17.1]	151 [12.4]	11.652	0.167
Conjunctivitis	23 [5.3]	22 [5.1]	5 [3.1]	2 [2.8]	1 [2.4]	3 [4.0]	56 [4.6]	2.69	>0.50
Vernal Conjunctivitis	19 [4.3]	22 [5.1]	10 [6.1]	4 [5.6]	2 [4.9]	4 [5.3]	61 [5.0]	1.03	>0.50
Stye	4 [0.9]	4 [0.9]	0 [0]	0 [0]	0 [0]	1 [1.3]	9 [0.7]	3.304	0.914
Squint	4 [0.9]	4 [0.9]	0 [0]	1 [1.4]	1 [2.4]	0 [0]	10 [0.8]	4.195	0.839
Conjunctival Xerosis	12 [2.7]	15 [3.5]	3 [1.8]	1 [1.4]	0 [0]	3 [4.0]	34 [2.8]	3.566	0.894
Total	181 [41.4]	187 [42.8]	49 [30.1]	20 [28.2]	10 [24.4]	36 [47.4]	483 [39.5]		

Table VII. Relation of Eye Problems with Father's Occupation

DISCUSSION

The present study observed that out of total 451 children (35.65%) were having one or more eye problems. This finding is similar to those of Shreshtha et al[6] (34.2%). Gupta Madhu et al[7] observed 31.6%, Rajesh et al[8] observed 24.6%, Kuruvilla et al[9] observed 12.5%, Pankaj Kumar et al[10] found 11.5% and Nepal et al[11] observed 11% prevalence of ocular morbidity in school children. In this study, overall prevalence of ocular morbidity was 39.9%.

Khurana et al[12] observed 58.77% ocular morbidity in 1984 in school children (4 - 18 yrs.) of Rohtak City. The observed difference may be due to difference of studied age group and urban area and the study being old.

In this study, most of the morbidities (51%) were found in oldest age group (13 - 15 yrs.), while least morbidities (29.4%) in the youngest age group (6 - 10 yrs.). Strong significant association was found with increase in age group in cases of defective vision and conjunctival xerosis. Prasanna et al[13] also showed an increase in ocular morbidity with age.

Fathers of 503 students (39.8%) were educated up to matriculation and above. While mothers of only 143 students (11.3%) were educated up to this level. Vernal Conjunctivitis shows significant association with father's literacy. Pankaj et al[10] and Deshpande et al[14] observed a significant association of ocular morbidity with mother's and father's literacy status. Dandona et al[15] Murthy et al[16] and Trivedi et al[17] observed a significant association of myopia in the child with higher educational status of the father.

In the present study, the prevalence of squamous blepharitis was found to be 12.3%, which was much more than the prevalence found in other studies, i.e. Prajapati P et al[18] observed 5.7%, Rajesh et al[8] observed 1.3%, Kumar R et al[19] observed 1%, Deshpande et al[14] observed 0.96%, Trivedi et al[17] observed 0.93% and Kuruvilla et al[9] observed 0.14% prevalence of squamous blepharitis. The difference may be because of rural area chosen for the present study.

In this study, the prevalence of conjunctivitis was found to be 4.7%. This is similar to those of Kumar R et al,[19] where in the prevalence was found to be 4.6%. Trivedi et al[17] observed 5.1%, Rajesh et al[8] 4.3%, Prajapati P et al[18] 3.8%, Deshpande et al[14] 2.57%, Prasanna et al[13] 2.3%, Shaffi et al[20] 1.5%, Kuruvilla et al[9] observed 1.1% prevalence and Khurana et al[12] observed 23.43% prevalence.

In the present study, the prevalence of vernal conjunctivitis was found to be 5.1%. This is higher than that found in other studies like Kehinde AV et al[21] (4.55%), Shaffi et al[20] (0.7%) and Kuruvilla et al[9] (0.66%). The higher prevalence may be because the spring season was also included in this study.

In the present study the prevalence of stye was found to be 0.7%, which is slightly lower than that reported by Deshpande et al[14] (1.74%) and Kumar R et al[19] (1.3%). Rajesh et al[11] found 1.0% and Madhu et al[7] observed 0.9% prevalence.

In this study, the prevalence of strabismus was found to be 0.8%. This finding is similar to those of Prasanna[13] (0.77%). Khurana et al[12] reported 0.66%, Murthy et al[16] reported 0.53%, Kuruvilla et al,[9] Gupta Madhu et al[7] and Singh Harpal et al[22] reported 2.02%, 2.5% and 2.08% prevalence of strabismus respectively. In the present study, strabismus was more prevalent in lower age groups.

In this study the prevalence of Vit. A deficiency was found to be 5.4%, which is more than Kehinde AV[21] (4.55%). Singh Harpal[22], Deshpande et al[14] and Prajapati P et al[18] recorded much higher prevalence of 13.66%, 25.58% and 29.3% respectively in school children.

In the present study, night blindness was observed in 2.6% children. This finding is greater than 0.30% as reported by Khurana et al.[12]

Conjunctival xerosis was recorded in 2.8% students in this study. Nepal et al[11] recorded 0.36% prevalence. In the present study, conjunctival xerosis was found to be more in higher age groups and this association was significant.

Not a single case of Bitot's spot was recorded in this study. This finding is similar to those of Shaffi et al,[20] wherein the Bitot's spots were prevalent in only 0 - 5 yrs. of age and no case was found in 6 - 15 yrs. of age group. Trivedi et al[18] recorded 3.9% prevalence. Kuruvilla et al[9] recorded 0.43% prevalence.

In this study, the prevalence of corneal opacity was found to be 0.15%. This finding is quite similar to 0.18% recorded by Khurana et al.[12] Kehinde et al[21] recorded 0.08% and Singh Harpal[22] observed much higher prevalence 5.86% in school children.

In the present study, the prevalence of ocular injuries was found to be 2.13%. Deshpande et al[14] and Singh Harpal et al[22] reported 3.48% and 5.33% prevalence. In this study,

prevalence of ocular injuries was more in boys as compared to girls and this difference is statistically significant. The reason may be the higher outdoor exposure in boys. Nystagmus was found in 5 students (0.4%) in this study.

CONCLUSION

Ocular morbidities among school going children can be easily identified by regular eye screening programmes and if treated promptly reduces the visual disabilities. The present study shows defective vision in one or both eyes and squamous blepharitis are the main causes of visual disability in school children. The eye health awareness among school children and school teachers help in reducing ocular morbidity, so that they can attain their full potential in the course of their education.

Recommendations

Eye checkup should be done at the time of entry in school and periodic evaluation of eye screening programme should be done. A good functioning referral system should be attached to the school health services. School health records should be maintained for followup. Community based vision screening programme should be encouraged and provision of good quality and affordable spectacles should be an integral part of the vision screening programme. Chaupal and other religious places can be used for spreading awareness regarding common eye diseases and advocating the need to focus on the health status of the growing children.

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