



# PREVALENCE OF OCULAR MORBIDITIES AMONG SCHOOL CHILDREN: A COMPARATIVE STUDY ACROSS SOCIAL CATEGORIES IN AJMER CITY

Renu Bedi<sup>1</sup>, Dinesh Kumar Bedi<sup>2</sup>, Charushila N Dudule<sup>3</sup>, Nizamuddin<sup>4</sup>, Mahesh Keswani<sup>5</sup>, Prabha Saxena<sup>6</sup>

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#### Author's Affiliation:

<sup>1</sup>Prof & Head, Dept of Community Medicine; <sup>2</sup>Senior Prof, Dept of Ophthalmology; <sup>3</sup>Resident, Dept of Ophthalmology, JLN Medical College, Ajmer; <sup>4</sup>Asso Prof, Dept of Ophthalmology, Govt Medical College, Kota; <sup>5</sup>Asso Prof, Dept of Community Med; <sup>6</sup>Senior Demonstrator, Dept of Community Med, JLN Medical College, Ajmer

#### Correspondence:

Dr. Renu Bedi  
dr.renu.bedi@gmail.com

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## ABSTRACT

**Introduction:** School children constitute a particular vulnerable group for ocular morbidities which can have detrimental effect on the academic, social and later the functional potential of individuals. This study was conducted to determine the comparative prevalence of category wise distribution of common ocular morbidities and their demographic correlates.

**Methods:** Descriptive cross sectional study done in J.L.N. Medical College and Hospital, Ajmer. **STUDY PERIOD:** October 2012 to September 2013.

**Results:** 2754 study subjects comprised the sample. In our study category wise distribution of refractive error showed that there was descending order of percentage of student of refractive error was in general, OBC, SC, ST category students in all types of refractive errors i.e. myopia, astigmatism and hypermetropia.

**Conclusion:** Reserved categories showed high ocular morbidity in total as compared to general unreserved category amongst the studied social categories.

**Key Words:** ocular morbidity, refractive error, school going children.

## INTRODUCTION

School children form an important large target group which must be screened adequately for early detection of eye diseases and prevention of blindness. During a child's first 12 years 80% of all learning comes through vision, and yet most children have not had a comprehensive eye examination prior to starting school<sup>1</sup>.

Common eye related problems in school children are- Refractive errors, amblyopia, squint, vitamin

A deficiency, allergic conjunctivitis, ocular infections, and less commonly congenital cataract glaucoma.

Children and adolescents comprise a major proportion of Indian population and are important as they are future of country's development. School children constitute a particular vulnerable group, and uncorrected refractive errors can have detrimental effect on the academic, social and later the functional potential of individuals.

A study pattern of ocular diseases in children and young adults is very important because while some eye conditions are just causes of ocular morbidity, others invariably lead to blindness. Also while some conditions like refractive errors and cataract are treatable, others like trachoma and vitamin A deficiency are largely preventable. Here we have studied prevalence of various ocular morbidities comparison in all social categories in the school going children in Ajmer city just to find out whether there is any significant difference in prevalence of ocular morbidities in children of all social categories to compare their causes in specific categories in relation to overall socioeconomic impact causing present status or not so that we can modify some factors to improve their outcome for betterment of vulnerable group.

No such social category wise study carried out anywhere so we could not find any reference to support our study in relation to comparative prevalence in all social categories and since it is an original article of such study at present till date further study with larger population is needed for more definitive conclusion.

## MATERIAL AND METHOD

This study was a community based, descriptive observational study carried out in 2754 school children in the age group of 10-18 years including all social categories in urban area of Ajmer city from October 2012 to September 2013. Six schools, both government and private were selected by simple random sampling. Children of these schools belong to different socio-economic strata of the society selected through PPS Sampling.

Prior written informed consent was acquired from the principal of the school. Preliminary examination was carried out in the school premises itself. This included torch light examination and direct ophthalmoscopy followed by testing of visual acuity & colour vision.

All the children were subjected to examination by an ophthalmologist like examination of orbit and adnexa, extra ocular motility, alignment of visual axis via Hirschberg test, lacrimal sac.-eye lid, anterior segment - with the help of torch light conjunctiva, cornea, anterior chamber, iris, pupil and lens were examined, posterior segment with the help of direct ophthalmoscope in every child, Visual acuity was done with Snellen's chart. The children with visual acuity less than or equal to 6/9 were referred for refraction, Colour vision with Ishihara's plates and diagnosis - Based on clinical assessment mostly and with diagnostic procedures when required and if preliminary assessment required fur-

ther work up then such students were referred to ophthalmology OPD, JLN Hospital, Ajmer.

All the observations were recorded in the pre designed pretested proforma.

**Data analysis:** All the data were entered in MS excel 2007 and analyzed by using Primer software. Difference in proportion was analyzed by using chi-square test.

## RESULT

A total of 2754 students were subjected to eye check up, where a total of 10-18 years age group of students among them, 1357 were boys and 1397 were girls. (M:F ratio=0.97:1), 1095(39.76%) students in general category, 985(35.77%) in OBC, 608(22.08%) in SC, and 66(2.40%) in ST category were examined.

Total 381 students having refractive error out of which 199 (52.23%) students were in general category, 116(30.45%) in OBC, 62(16.27%) in SC and 4(1.05) in ST category.

Conjunctival disorders like conjunctivitis, pterygium and conjunctival mole were found in 35 students of which 10(28.57%) were in general category, 11 (31.43%) in OBC, 12 (34.29%) in SC and 2 (5.71%) in ST category.

Lid disorders like ptosis, sty, chalazion, blepharitis, and vitiligo lid were found among 18 students out of which 8(44.44%) students were in general category, 6(33.33%) in OBC category, 4(22.22%) in SC category and 0(0.00%) in ST category.

Total 7 students were having squint of which 4 were of divergent and 3 were of convergent type. Divergent squint in general category was found in 1(14.29%) student, 2(28.57%) in SC category student and 1(14.29%) in ST category. Whereas convergent squint was found in 2 student of SC category and 1 in OBC category.

Other ocular disorders like nystagmus, amblyopia, colour vision defect, corneal opacity, congenital cataract and some miscellaneous disorders were found in total 27 students out of which 7(25.93%) in general category, 10(37.04%) in OBC, 9(33.33%) in SC and 1(3.70%) in ST category students.

**Table 1: Category wise distribution of students**

Category	Male (%)	Female (%)	Total (%)
ST*	34 (51.51)	32 (48.48)	66 (2.40)
SC#	449 (73.84)	159 (26.15)	608 (22.08)
OBC@	517 (52.48)	468 (47.51)	985 (35.77)
General	357 (32.60)	738 (67.39)	1095 (39.76)
Total	1357	1397	2754

\*Schedule tribe; #Schedule caste; @Other Backward Class

**Table.2: category wise distribution of total ocular morbidity**

Category	Male			Female			Total Students		
	Examined	Ocular morbidities	Prevalence (%)	Examined	Ocular morbidities	Prevalence (%)	Examined	Ocular morbidities	Prevalence (%)
ST	34	2	5.8	32	5	15.6	66	7	10.6
SC	449	52	11.58	159	33	20.75	608	85	13.98
OBC	517	58	11.21	468	75	16.03	985	133	13.50
General	357	65	18.20	738	150	20.32	1095	215	19.63
Total	1357	177	13.04	1397	263	18.82	2754	440	15.97

ST=Schedule tribe; SC=Schedule caste; OBC= Other Backward Class

**Table 3: category wise distribution of different ocular morbidities in Social categories**

Category*	Refractive Errors (%)	Conjunctival Disorders (%)	Lid Disorders (%)	Squint (%)
General (unreserved) (215) (A)	196 (91.16)	10 (4.65)	08 (3.72)	01 (0.46)
OBC (133) (B)	114 (85.71)	11 (3.27)	06 (4.51)	02 (1.50)
SC (85) (C)	66 (77.64)	12 (14.11)	03 (3.52)	04 (4.70)
ST (7) (D)	04 (57.14)	02 (28.57)	0 (0.00)	1 (14.28)
Reserved (E=B+C+D) (225)	184 (81.77)	25 (11.11)	09 (4)	07 (3.11)
$\chi^2$ between A & B	13.89 (p<0.001)	0.21 (p>0.05)	0.11 (p>0.05)	0.44 (p>0.05)
$\chi^2$ between A & C	14.90 (p<0.001)	3.44 (p>0.05)	0.34 (p>0.05)	4.286 (p<0.05)
$\chi^2$ between A & D	6.11 (p<0.05)	2.72 (p>0.05)	0.48 (p>0.05)	7.33 (p<0.01)
$\chi^2$ between A & E	25.70 (p<0.001)	0.53 (p>0.05)	0.38 (p>0.05)	2.48 (p>0.05)

ST=Schedule tribe; SC=Schedule caste; OBC= Other Backward Class; P <0.05 is statistically significant

\*Figures in bracket indicate number of children with ocular morbidities

As shown in table 2 The difference in male:female prevalence of ocular morbidities was more in SC and ST categories than OBC and General categories. Overall prevalence of ocular morbidities was highest in general category.

As shown in table 3 refractory errors were most common morbidity across all social categories followed by conjunctival disorders. Refractory errors were significantly more in general category students compare to other categories (p<0.05). However in other type of ocular morbidities were distributed similarly across all social categories (p>0.05).

## DISCUSSION

Although vision is very important to people of all ages, it is more so in children and adolescents as it has key role in their mental, physical and psychological development. Most of the childhood blindness is easily treatable and preventable, however if it is not detected and prevented in time it may lead to a permanent visual disability. A fact that 30% of India's blind lose their sight before the age of 20 years emphasizes the importance of early detection and treatment of ocular morbidity and visual impairment in younger children. This is why WHO launched Global Initiative Vision 2020 for the prevention of avoidable visual impairment by the year 2020.

The present study was undertaken by screening of school children of various schools of Ajmer city. A total of 2754 children were examined, out of which

1357(49.27%) were males and 1397(50.73%) were females.

The students were divided by two different ways, first by their age group in which nearly half (46.94%) were in the age group of 13-15 years and second by their category where maximum number of students were of general category (39.76%) followed by OBC (35.77%) with total prevalence of 19.63% in General, 13.50% in Other backward caste, 13.98% in Schedule Caste and 10.6% in Schedule Tribe categories

In our study total morbidity in general category was 215 (48.86%), and in reserved category it was 225(51.13%) out of 440 total students having ocular morbidities. Total 196(91.16%) children were having refracting error in General category as compared to 184 (81.77%) in reserved categories,

In our study category wise distribution of refractive error showed that there was descending order of percentage of student of refractive error was found in general, Other backward caste, Schedule Caste and Schedule Tribe category students in all 3 types of refractive errors i.e. myopia, astigmatism and hypermetropia which proved that there is no change in observation in category distribution with total prevalence of refractive error out of studied population 17.89% in General, 11.57% in Other backward caste, 10.85% in schedule caste, 6.06% in schedule tribe.

Adegbehingbe B.O. et al(2005)<sup>8</sup> found same Prevalence of refractive error 13.5% in their study in Llelfe, Nigeria, Ovenseri Oogbomo GO et al (2009)<sup>10</sup> 13.3%, Mahapatro S et al (2010)<sup>9</sup> 16.6%

and Shrestha R.K. et al (2011)<sup>3</sup> 11.9% in their study. These results are more or less comparable to our study.

Total 10 (4.65%) children were having conjunctival disorders as compared higher morbidity around 25 (11.11%) children in reserved category which shows high prevalence in reserved categories. Lid disorders in unreserved categories were present in 08 (3.72%) whereas 09 (4%) in reserved categories again showing high prevalence among reserved category children. Children in unreserved category having squint disorder was 1 (0.46%) as compared to 07 (3.11%) in reserved category again supporting high prevalence in reserved category. Desai et al (1989)<sup>2</sup> found the prevalence of conjunctivitis 5% , Adegbehingbe B.O. et al (2005)<sup>8</sup> 49.0%, Kumar Rajesh et al (2007)<sup>7</sup> 4.6%, Mahapatro S et al (2010)<sup>9</sup> 3.5% and Shrepa D et al (2011)<sup>6</sup> 1.71%.

Our study showed 133 (30.22%) children with overall ocular morbidity in Other backward caste category whereas 92 (20.90%) children in Schedule Caste, Schedule Tribe category in total morbidity of 440 children, out of which 114 (85.71%) children were having refractive error in Other Backward Caste category and total 70 (76.08%) in Schedule Caste, Schedule Tribe category, conjunctival disorder in Other Backward Caste were found in 11 (8.37%) and 14 (15.21%) in Schedule Caste, Schedule Tribe category, Lid disorders were 6 (4.51%) in Other Backward caste and 3 (3.26%) in Schedule Caste category and none in Schedule Tribe category, Children having squint disorder in Other Backward Caste were 2 (1.5%) whereas it was 5 (5.43%) in Schedule Caste, Schedule Tribe category showing much higher prevalence in Schedule Caste and Schedule Tribe category than OBC.

In our study category wise distribution of refractive error showed that there was descending order of percentage of student of refractive error was found in general, Other Backward Caste, Schedule Caste and Schedule Tribe category students in all 3 types of refractive errors i.e. myopia, astigmatism and hypermetropia which proved that there is no change in observation in category distribution.

In our study 2 (5.71%) Schedule Tribe category students had conjunctivitis. 2 (5.71%) Schedule Caste category students had conjunctivitis, 1 (2.86%) had pterygium and 9 (25.71%) had conjunctival mole. 6 (17.14%) Other Backward Caste category students had conjunctivitis, 2 (5.71%) had pterygium and 3 (8.57%) had conjunctival mole while 5 (14.29%) general category students had conjunctivitis and 5 (14.29%) had conjunctival mole.

For lid disorders in our study 2 (11.11%) Schedule Caste category students had sty, 1 (5.56%) had chalazion and 1 (5.56%) had vitiligo lid. 1 (5.56%)

Other Backward Caste category student had ptosis, 3 (16.67%) had sty and 2 (11.11%) had chalazion while 1 (5.56%) general category student had sty, 6 (37.33%) had chalazion and 1 (5.56%) had blepharitis. No Schedule Tribe category student had any lid disorder.

Desai et al (1989)<sup>2</sup> found the prevalence of chalazion 0.25% and of sty 0.21%. These results were more or less comparable to our study. Where as Mahapatro S et al (2010)<sup>9</sup> found the higher prevalence of chalazion 1.0% and sty 0.8%. This is probably because of higher prevalence of refractive errors in their study and association of these diseases with the refractive errors.

In our study prevalence of squint was found 0.25%. More than half of the cases (57.14%) were of divergent squint. Males were more affected than females. The age wise distribution was nearly same to all age groups. The Schedule Caste category students were more affected as compared to other categories.

Desai et al (1989)<sup>2</sup> found the prevalence of squint 0.21%, Ajaiyeobe AI et al (2006)<sup>12</sup> 0.3%, Kumar Rajesh et al (2007)<sup>7</sup> 0.5% , Ayanniyi AA et al (2010)<sup>13</sup> 0.4%, Shrepa D et al (2011)<sup>6</sup> 0.43% and Singh Harpal (2011)<sup>4</sup> 0.3%. These results are more or less comparable to our study.

The prevalence of amblyopia was found to be 0.25% in our study. Males were more amblyopic as compared to females and maximum number of cases of amblyopia was found in higher age group 16-18 years. SC category students had maximum number of cases of amblyopia as compared to other categories. This is probably because of ignorance as well as less awareness of the diseases in SC category students.

Mahapatro S et al (2010)<sup>9</sup> found the prevalence of amblyopia 0.4%, Ayanniyi AA et al (2010)<sup>13</sup> 0.4% , Shrepa D et al (2011)<sup>6</sup> 0.43% and Shrestha R.K. et al (2011)<sup>3</sup> 0.142% in their study.

The percentage of colour vision defect was found to be 1.82% of ocular morbidity i.e. the prevalence of the disease was 0.29%. More than ¾ cases (87.50%) were males. This is because of the disease is X-linked recessive and manifest in all males having X-chromosome. While females manifest only when both of the X-chromosomes are diseased, otherwise remain carrier in their life. The distribution of the disease is nearly equal in 13-15 years age group and 16-18 years age group and in general category students and OBC category students.

In the study of Shrepa D et al (2011)<sup>6</sup> in Dhulikhel, Nepal, the prevalence of colour vision defect was found to be 0.43% This results are comparable to our study. Whereas higher prevalence was reported

ed by Desai S et al (1989)<sup>2</sup> in Jodhpur , India,2.88%, Shrestha RK et al (2006)<sup>3</sup> 2.2% in Kathmandu, Nepal, Kumar Rajesh et al (2007)<sup>7</sup> 1.0% in Delhi, India.

Its an original article with this kind of objective studied for the first time hence no similar category study was found in the country for comparison.

## CONCLUSION

Of the 1095 general category students 215 had ocular disorders thereby constituting 48.86% of total general category students while remaining 1659 of combined Schedule Caste/Schedule Tribe /Other Backward Caste category students 225 students had ocular disorders, thereby constituting 51.13% which points to the fact that higher ocular morbidity in Schedule Caste/Schedule Tribe/Other Backward Caste category students was observed in comparison to General category students.

No other such study has been carried out in country for comparison and for accurate comparison of prevalence amongst the social categories, another study on larger sample is needed. The need of this type of study is to find out importance of ocular morbidity in all social categories and their comparison amongst the group.

In our study newly diagnosed cases of ocular morbidity were very high which demands yearly school eye check up to be made.

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