Prevalence of ocular morbidity among school children in Ajmer city

Dr. Renu Bedi,[1] Dr. Dinesh Kumar Bedi,[2] Dr. Nizamuddin[3] Dr. Charushila Dudule[4] Dr Rashmi Gupta[5]Dr Sanjeev Sharma[6]

[1.]*Professor and Head Department of Community medicine J.L.N. Medical College, Ajmer*
[2.]*Sr. Professor Department of Ophthalmology, J.L.N. Medical College, Ajmer*
[3.4Dr]*. Resident , Department of ophthalmology, J.L.N. Medical College, Ajmer*
[5,6] *Assistant Professor, Department of Community medicine J.L.N. Medical College, Ajmer*

***Abstract**:*
Objectives: *To determine the prevalence of common ocular morbidities and their demographic correlates.*
Study Design And Setting: *Descriptive cross sectional study done in Schools of Ajmer city.*
Study Period: *October 2012 to September 2013.*
Results: *A total of 2754 students were subjected to eye check up, where a total of10-18 years age group with(M:F ratio=0.97:1.Ocular morbidity was detected in 440(15.98%) and 5%students had more than one ocular disorders. among males were 40.23% while females constituted 59.77%. According to age, ocular morbidity were significantly more(50.5%) in 13 to 15 years of age group (P=0.023S)and in females .(P<0.05S) Out of 2754 students 381 had refractive error, the most common ocular morbidity which accounted to 13.83% while of 440 students of total ocular morbidity it contributed to 86.59% followed by conjunctival mole (3.86%) then conjunctivitis (3.4%)*
Conclusion: *This study shows the recent prevalence of most common ocular morbidities which include refractive error, were very high which demands yearly school eye check up to be made compulsory to improve the quality of eye-sight.*
Key Words: *ocular morbidity, refractive error, school going children*

I. Introduction

Mostly ocular morbidity originates in childhood and if undetected may result in severe ocular disabilities, in addition to affecting development, educational performance[1]Children in the school-going age group (6-16 years) represent 25% of the population in the developing countries, form an important large target group, are easily accessible and schools are the best forum to the children [2] which must be screened adequately for early detection of eye diseases and prevention of blindness for imparting health education. During a child's first 12 years of life 80% of all learning comes through vision, and yet most children have not had a comprehensive eye examination prior to starting school[2].

According to World Health Organization (WHO) statistics, there were 0.7 million of the world`s blind children living in South-East Asia region.[1] A national survey on blindness 2001-02 showed that 7% of children aged 10-14 years have problems with their eye sight.Considering the fact that 30% of India's blind lose their sight before the age of 20 years, the importance of early detection and treatment of ocular morbidity and visual impairment in young children is obvious.

VISION 2020: The Right to Sight is a global initiative launched by WHO in 1999 to eliminate avoidable blindness like cataract, xerophthalmia, refractive error, trachoma and other causes of childhood blindness by year 2020.[3]

Globally refractive errors are one of the most common causes of visual impairment and second leading cause of treatable blindness. Its presence implies inadequate ophthalmic care services in the population concerned as treatment of refractive error is probably the simplest and most effective eye care intervention. The majority of blindness is either potentially preventable or curable

Periodic screening of all children helps in early identification of visual defects and their correction by spectacles. If children are diagnosed and treated early there is great scope for higher education, better understanding and prosperous life.

Many ocular diseases have their origin in childhood and the morbidity may go unnoticed and adversely affect the child's performance in school and may also cause severe ocular disability in the later part of life. With this background, it was envisaged (i) to estimate the prevalence of ocular morbidity amongst primary school children in Ajmer city treat the treatable to prevent ocular morbidity and (ii) to study the socio-demographic factors responsible for the causes of Ocular morbidity in the school children.

II.   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 in urban area of Ajmer city from October 2012 to September 2013. Six schools,both government and private were selected by simple random 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 following 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 Via Ishihara's plates and diagnosis – Based on clinical assessment mostly and with diagnostic procedures when required and if preliminary assessment required further work up then such students were referred to Ophthalmology OPD , JLN Hospital, Ajmer.

In the OPD, these students were subjected to Visual acuity measurement for distance on Snellen's visual drum ; near vision on the Jeager's chart at a distance of 25-30 cm. Detailed anterior segment examination was done on the slit lamp biomicroscope; Streak retinoscopy was done under cycloplegia. 1% cyclopentolate eye drops were used as cycloplegic in all students, Subjective refractive correction was given after 3 days performing the retinoscopy; Intra ocular pressure was proposed to be measured by Schiotz tonometer in suspected cases of high IOP.Fundus examination was done with direct and indirect ophthalmoscopy in all such students with defective vision(6/9).Syringing was done under topical anaesthesia in the case of chronic dacryocystitis.

2.1Diagnostic criteria for abnormal refraction : Diagnosis of myopia was made if refractive error was > -0.50 D and Hypermetropia was recorded if refractive error was > +1.0 D.

Astigmatism was recorded if refractive error was > ±0.50 D.

Diagnosis of amblyopia was made if vision is 6/12 or worse after best correction with no evident organic pathology.

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

2.2Data 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 .The test of significance was kept P<0.05.

III.   Result:

This study was undertaken in different schools of Ajmer city belonging to different strata of the society by PPS stratified random sampling. A total of 2754 students were subjected to eye check up, where a total of10-18 years age group of students among them ,1357 were boys and 1397were girls. (M:F ratio=0.97:1). ,According to age , maximum of 46.94% were in the age group of 13-15 years, 35.43% in 16 to18 years and least (17.61%) were in 10 to 12 years of the age groups. Out of 2754 students, ocular morbidity was detected in 440(15.98%) among them , males were 40.23% while females constituted 59.77%. Four forty students with ocular morbidity had 468 disorders which can be explained by the fact that 22 cases (5%) students had more than one ocular disorders. According to age, ocular morbidity were significantly more(50.5%) in 13 to 15 years of age group (P=0.023S). Proportion of the cases were significantly more in females as compared to males (59.8% vs 40.2%)(P<0.001S) and significantly more in general category as compared to SC, ST and OBC.

No significant association was observed according to age but males were significantly more as compared to females in Students having more than one ocular disorder as compared to single disorder(P=0.038S).(Table 3)

Out of 2754 students 381 had refractive error, the most common ocular morbidity which accounted to 13.83% while of 440 students of total ocular morbidity it contributed to 86.59% followed by conjunctival mole (3.86%) then conjunctivitis (3.4%) and 8 cases had defective colour vision thereby showing a prevalence of 0.29% while it constituted 1.82% of total ocular morbidity. (Table 4)

Out of 2754 students 381 had refractive error, the most common ocular morbidity which accounted to 13.83% .According to age , Proportion of cases with Refractory error were significantly more in age group (13 to 15 years). Proportion of females were more as compared to males (90.49% vs 80.79%) and in general category cases(92.56%).

Conjunctival disorder constituted 7.95% (35/440)of total ocular morbidity while prevalence was 1.27%. Maximum number of cases was of conjunctivitis and conjunctival mole. Conjunctival mole was found to be the most common type of conjunctival morbidity, 3.86% of ocular morbidity and the prevalence was 0.62%. According to age , Proportion of cases were significantly more(12.98%) in age group (16 to 18 years and in ST category cases(28.57%). No significant difference was observed according to sex.

In this study lid disorders were found to be 4.09% of the ocular disorders i.e. the prevalence of lid disorder was 0.65%. No significant difference was observed according to age, sex and caste.

Out of 2754 students , Squint had 0.25%. with males preponderance (3.39%) while only 0.38% were females(P=0.03S) . No significant difference was observed according to age and caste.

Observation

Table No1:Profile of Study Population

AGE GROUPS (YEARS)	Total(N=2754)	
	No	%
10 to 12	485	17.61
13 to 15	1293	46.95
16 to 18	976	35.44
Sex		
Male	1357	49.27
Female	1397	50.73
ST	66	2.40
SC	608	22.08
OBC	985	35.77
General	1095	39.76
Students having single ocular	418	15.18
Students having more than one ocular disorder	22	0.80

Table No 2. Association of the profile of study population with ocular morbidity status

Age group	Present		Absent		Total		Chi Square Test
	No.	%	No.	%	No.	%	P Value LS
10 to 12	87	19.8	398	17.20	485	17.61	7.505 with 2 df; P = 0.023S
13 to 15	222	50.5	1071	46.28	1293	46.95	
16 to 18	131	29.8	845	36.52	976	35.44	
Total	440	100.0	2314	100	2754	100.00	
Male	177	40.2	1180	50.99	1357	49.27	16.718 with 1df; P <0.001S
Female	263	59.8	1134	49.01	1397	50.73	
	440	100.0	2314	100.00	2754	100.00	
Category							-
ST	7	1.6	59	2.55	66	2.40	18.630 with 3 df; P <0.001S
SC	85	19.3	523	22.60	608	22.08	
OBC	133	30.2	852	36.82	985	35.77	
General	215	48.9	880	38.03	1095	39.76	

Figure: Association of the profile of study population with ocular morbidity status
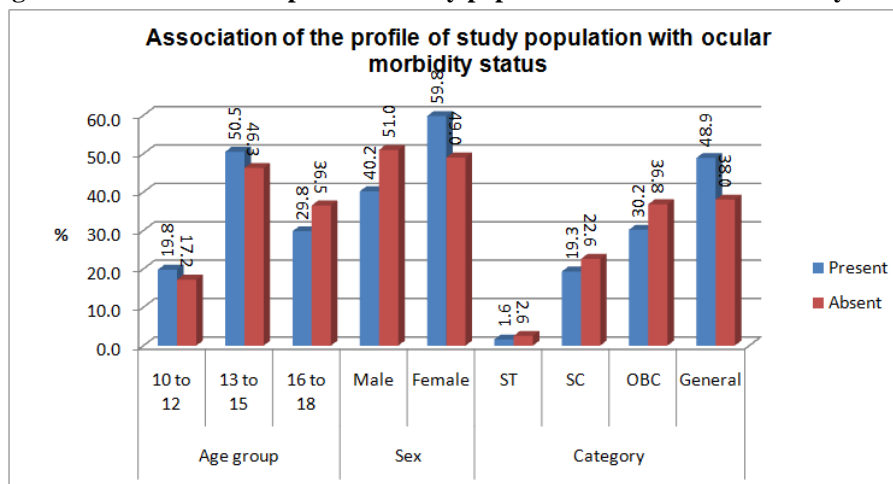
Table No3 Association of age and sex with presence of ocular disorder

	Students having single ocular (N=418)		Students having more than one ocular disorder(N=22)		Total(N=422)		Chi-square Test
	No.	%	No.	%	No.	%	
Age group (years)							
10 to 12	84	20.10	3	13.64	87	20.62	0.550 with 2 df; P = 0.759
13 to 15	210	50.24	12	54.55	222	52.61	
16 to 18	124	29.67	7	31.82	131	31.04	
Male	163	39.00	14	63.64	177	41.94	4.303 with 1 df; P = 0.038
Female	255	61.00	8	36.36	263	62.32	

Table 4 : Distribution of overall prevalence of ocular morbidity

Sr. No.	Ocular morbidity	No.	%out of 440	%out of 2754
1	REFRACTIVE ERROR	381	86.59	13.83
2	CONJUNCTIVAL MOLE	17	3.86	0.62
3	CONJUNCTIVITIS	15	3.4	0.54
4	CHALAZION	9	2.04	0.33
5	COLOUR VISION DEFECT	8	1.81	0.29
6	AMBLYOPIA	7	1.59	0.25
7	STYE	6	1.36	0.22
8	DIVERGENT SQUINT	4	0.9.	0.15
9	NYSTAGMUS	3	0.68	0.11
10	PTERYGIUM	3	0.68	0.11
11	CONVERGENT SQUINT	3	0.68	0.11
12	CORNEAL OPACITY	2	0.45	0.07
13	CONGENITAL CATARACT	2	0.45	0.07
14	PTOSIS	1	0.22	0.04
15	BLEPHARITIS	1	0.22	0.04
16	VITILIGO LID	1	0.22	0.04
17	MISCELLANEOUS	5	1.13	0.18

Table 5 : Age ,Sex And Category Wise Distribution Of The Ocular Morbidities

	Total (N=440)	Refractive Error(381)		Conjunctival Disorders (N=35)		LID DISORDER(N=18)		Squint (N=7)	
Age group (years)		Total							
		No.	%	No.	%	No.	%	No.	%
10 to 12	87	72	82.76	5	5.75	7	8.05	2	2.3
13 to 15	222	201	90.54	13	5.86	9	4.05	2	0.9
16 to 18	131	108	82.44	17	12.98	2	1.53	3	2.29
Chi Square Test P value LS	0.049S			0.04S		0.059NS		0.506NS	
sex									
Male	177	143	80.79	19	10.73	7	3.95	6	3.39
Female	263	238	90.49	16	6.08	11	4.18	1	0.38
Chi Square Test P value LS	0.005S			0.11NS		0.89NS		0.03S	
Category									
ST	7	4	57.14	2	28.57	0	0	1	14.3
SC	85	62	72.94	12	14.12	4	4.71	4	4.71
OBC	133	116	87.22	11	8.27	6	4.51	1	0.75
General	215	199	92.56	10	4.65	8	3.72	1	0.47
Chi Square Test P value LS	<0.001S			0.01S		1.0NS		<0.001S	

IV.   Discussion

In this study, the prevalence of ocular morbidity was found to be 15.98%. A similar prevalence of ocular morbidity was reported by Shrestha R.K.et al (2011)[4] 19.56% and singh Harpal (2011)[7] 14.5% in their study. A higher prevalence of ocular morbidity was reported by Deshpande Jayant et al (2011)[10] 27.65% and Gogate parikshit et al (2011)[11]45.3%and a lower prevalence was reported by Shrepa D et al (2011)[15] 10.08%. The difference may be due to different study areas.

In this study average ocular morbidity per affected child was 1.1, as 28 students (among the affected 440)had more than one ocular morbidity similar results were found in the study of Kumar Rajesh et al (2007) and Shrestha R. K. et al[4].

According to age, ocular morbidity were significantly more(50.5%) in 13 to 15 years of age group (P=0.023S). In study of Kumar Rajesh et al , the prevalence of ocular morbidity increased with age, being minimum (17.5%) in 5-6 years age group and maximum (37.5%) in 13-14 years age group. The association was found to be statistically significant

 Interestingly prevalence of ocular morbidity increased with increase in age, which could be attributed to cumulative effect of diseases such as refractive errors and trachoma and possibly greater exposure in older children leading to higher incidence of conjunctivitis.

Out of 2754 students 381 had refractive error, the most common ocular morbidity which accounted to 13.83% while of 440 students of total ocular morbidity it contributed to 86.59% followed by conjunctival mole (3.86%) then conjunctivitis (3.4%)(Table 4)

Out of 2754 students 381 had refractive error, the most common ocular morbidity which accounted to 13.83%

Adegbehingbe B.O. et al(2005)[19] found same prevalence of refractive error 13.5% in the their study in Mahapatro S et al (2010)[21] 16.6% and Shrestha R.K. et al (2011)[4] 11.9% in their study. These results are more or less comparable to this study. These differences may be explained by the different diagnostic criteria used by different authors, racial or ethnic variations in the prevalence of refractive errors,

different lifestyles or living conditions

According to age , Proportion of cases with Refractory error were significantly more in age group (13 to 15 years). The similar pattern of the prevalence of refractive error was found in Lahore city, Pakistan by Ali Ayub et al (2007) and by Hussein A Bataineh et al (2008)[24] in Tafila city, Jordan. Screening for refractive errors is an integral part of School health problem. Unfortunately it is not taken seriously and children suffering with refractive errors are still high. If we could detect refractive errors early in life, not only will we be reducing the disability but also reducing the chances of developing amblyopia.

Proportion of females were more as compared to males (90.49% vs 80.79%) and in general category cases(92.56%). In the present study females were outnumbered (62.47%) than males (37.53%). Similar results were observed by Ovenseri Ogoboma GO et al (2009)[20] and Mahapatro et al (2010)[21].

Conjunctival disorder constituted 7.95% (35/440) of total ocular morbidity while prevalence was 1.27%. Maximum number of cases was of conjunctivitis and conjunctival mole. Conjunctival mole was found to be the most common type of conjunctival morbidity, 3.86% of ocular morbidity and the prevalence was 0.62%. In the study of Shrepa D et al (2011)[28] in Dhulikhel, Nepal, the prevalence of conjunctival mole was0.43% which is comparable to this study. These results are more or less comparable to this study. While prevalence of conjunctivitis   Mahapatro S et al (2010)[21] 3.5% and Shrepa D et al (2011)[28] 1.71%. The difference in the prevalence in these studied may be due to seasonal variation of conjunctivitis and variation may also occur because of short duration of the illness.

According to age , Proportion of cases were significantly more(12.98%) in age group (16 to 18 years and in ST category cases(28.57%). No significant difference was observed .The study showed an increase in morbidity with age. This may be due to the fact that the dropout rate from school was high due to poverty, and refractive error related to habits like prolonged study hours, watching television, increased bad reading posture and hygienic practice related also increased.

In this study lid disorders were found to be 4.09% of the ocular disorders i.e. the prevalence of lid disorder was 0.65%. Ajaiyeoba AI et al (2006)[2] found 0.7% prevalence of lid disorders in their study which is comparable to this study.No significant difference was observed according to age, sex and caste in lid disorders..

Out of 2754 students , Squint had 0.25%. with males preponderance (3.39%) while only 0.38% were females(P=0.03S) . No significant difference was observed according to age and caste.However, higher (7.4% in 5-15 years) and lower (0.2-0.6% in 4-18 years) prevalence ofsquint has been reported from Rajasthan (Desai S 1989) and Delhi Chaturvedi S (1999).

Of 2754 students examined 8 had defective colour vision thereby showing a prevalence of 0.29% while it constituted 1.82% of total ocular morbidity Almost similar observation was found in Desai S (1989) (2.9% in 4-16 years) reported from Rajasthan. However, lower prevalence of color vision defects (0.11%) has been

reported by Pratap et al.,(1989) it may be due y]to Children are less likely to attend eye care centers for colour blindness.

In this study prevalence of squint was found 0.25%,age wise distribution was nearly same to all the age groups and males had higher preponderance of squint (85.71%) among squint cases while only 14.29% were females .Kumar Rajesh et al (2007)[32]0.5%, Ayanniyi AA et al (2010)[33] 0.4%,and Singh harpal (2011)[7] 0.3%. these results are more or less comparable to this study.

Of 2754 students examined 8 had defective colour vision thereby showing a prevalence of 0.29% while it constituted 1.82% of total ocular morbidity.

V.   Conclusion

The magnitude of occular morbidity was 15.98%.and Refractive error was observed in significant percentage (86.59% of all ocular morbidities) among the school going children at Ajmer(Rajasthan) which should be corrected in time before 12 years of age to avoid development of permanent visual disability in the form of anisometric amblyopia.

Newly diagnosed cases of ocular morbidity were very high which demands yearly school eye check up to be made compulsory to improve the quality of eye-sight. School health problem ,is cost effective strategies and appropriate eye care programs targeting school children to reduce the burden of visual impairment .IEC activities should be promoted regarding the common sign symptoms of ocular disorders, ocular hygiene and health care.

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