

Original article:

A study on ocular morbidity and its associates among Madrasah students of Kolkata

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Abstract:

Introduction: Avoiding preventable blindness is a major challenge of Vision 2020. Most ocular morbidities develop during school going period, allowing them to be detected best by school screening programs. Students of madrasah usually belong to the underprivileged section of the community. Present study was to bring out the magnitude and patterns of ocular morbidity among madrasah children of Kolkata and to find out different socio-demographic associates of ocular morbidity.

Material and Methods: 1649 students, ranging from 8-17 years age randomly selected from different madrasahs in Kolkata, during the academic session 2013-14, and were interviewed (including their parents for socio-economic status) and examined for ocular morbidity, the necessary sample was selected by simple random sampling technique using computer generated random numbers from statistical package “Program for Epidemiologists (PEPI)”, version 4.0, windows compatible.

Results: The prevalence of ocular morbidity was found to be 12.67%, majority being refractive errors (9.40%) with myopia being the commonest (7.76%). Amblyopia and squint was observed to be 1.09% and 1.57% respectively followed by Pterygium and Chalazion, 0.12% each. Increasing age and metropolitan habitat were significantly associated with ocular morbidity.

Conclusion: Refractive error was the commonest ocular morbidity observed, myopia being the commonest. The importance of school eye screening should be duly recognised to protect the under privileged.

Key words:Ocular Morbidity, Madrasah students

Introduction:

“Vision 2020, the right to sight”, envisages to reduce avoidable blindness by 2020^[1]. It is a global initiative with a major challenge to avoid the preventable blindness. The school age is a formative period, both physically and mentally, transforming the child into a promising adult. Considering the fact that 30% of India’s blind lose their sight before the age of 20 years, and 80% of the blindness is avoidable, making the importance of early detection followed by treatment of ocular morbidity and visual impairment obvious^[2].

Refractive errors are the leading cause of ocular morbidity in school going and school aged children reported in India^[3]. Multiple studies in different parts in India report a burden of uncorrected refractive errors among school going children to be 2.63-7.4%^[4-6]. Relevant data of Kolkata, the capital of West Bengal, is largely lacking especially about those children of Kolkata belonging to the minority community and receiving their education in madrasahs. Children studying in madrasahs commonly belong to weaker and underprivileged section of our society and our

endeavour here was to bring out the magnitude and patterns of ocular morbidity among madrasah children of Kolkata and to find out different socio-demographic associates of ocular morbidity.

Materials and Methods:

This is a cross-sectional study, carried out during the period, January'13-14, amongst students of class V-VIII standards, comprising of age group 8-17years, studying in Government sponsored Madrasahs of Kolkata, during the academic session 2013-14. The study has been conducted from Regional Institute of Ophthalmology (RIO), Medical College and Hospital, Kolkata. The respective ethical clearance was obtained from ethical committee of Medical College and Hospital, Kolkata. The universe for this study consisted of 20 madrasahs of Kolkata district, comprising of 3917 students of class V-VIII.

Upon extensive searching, no reference study on ocular morbidity exclusively of muslim children of Kolkata / India was available. Therefore, a study conducted among primary school children in Delhi metropolis^[7]. by Rajesh Kumar et al was taken as reference. The sample size was calculated using standard formula $4 PQ/L^2$ where P = ocular morbidity prevalence, Q = 1-P and L = allowable error. Considering P = 0.227^[7] and L=10% of P, the sample size came to be 1498 including 10% allowance for non response. After enlisting all students of all Madrasahs of Kolkata, the necessary sample was selected by simple random sampling technique using computer generated random numbers from statistical package "Program for Epidemiologists (PEPI)", version 4.0, windows compatible. During the study, some students in addition to the sampled students volunteered to participate and they were included. Thus, the final sample size came to be 1649. Madrasah students of Kolkata comprised of two distinct groups e.g. one who were exposed to congested highly populated

metropolitan city life and other residing in green and serene 'rural' conditions at the periphery of Kolkata.

After prior permission from respective authorities, all students were individually interviewed in a friendly manner using predesigned pre-tested schedule followed by examination by ophthalmologists. Snellen's and Jaeger's charts were used for distant and near vision respectively. Colour vision was assessed by pseudo-isochromatic plates of Ishihara. Cycloplegic refraction by trained optometrist was done for those students having vision less than 6/6 and those having suggestive symptoms of headache or eye discomfort even with normal vision followed by post-cycloplegic test, at least 3 days later at Regional Institute of Ophthalmology (RIO), Kolkata. On spot undilated funduscopy was done followed by dilated funduscopy of the complicated or unmanageable patients at RIO for further evaluation and management. Latent and manifest squints were detected by cover-uncover and cover tests respectively. Visual axis deviation was detected by corneal light reflex test. Additional information as required including information on socio-economic status was collected from the parents by suitable questionnaire sent to the students' home including home visits as necessary. All students having ocular morbidity were given appropriate treatment at RIO Kolkata.

Variables included in the study were age (completed years) determined from school records, sex, habitat (metropolitan city and green and serene) and socio-economic status determined by Kuppuswamy's socio-economic status scale^[8]. Ocular morbidities were diagnosed as per standard clinical practice. Data collected were analysed with help of Ms Excel 2007, PEPI version 4.0 and Statistical Product and Service Solution (SPSS)

17.0 all windows compatible. Suitable tests of significance applied as applicable.

Results:

Present study was done among 1649 madrasah students of Kolkata of which boys were 562 (34.0 %) and girls were 1087 (66.0 %) Students residing in metropolitan areas were 970 (58.8%) whereas

those residing in greener conditions were 679 (41.2%). Their age ranges 8-17years. Majority students, (88.65%) belong to socio-economic class IV of Kuppuswamy’s social class.

The patterns of ocular morbidity are depicted in table1. It shows that Refractive errors are the major ocular morbidity among students.

Table – 1

Distribution of Ocular Morbidity among Madrasah students of Kolkata (N= 1649)

Type of Ocular Morbidity	Number (%)
1. Refractive Errors	155 (9.40)
2. Squint	26 (1.58)
3 Amblyopia	18 (1.09)
4.Pterygium	02 (0.12)
5. Chalazion	02 (0.12)
6. Others [#]	06 (0.36)
[# One each of Stye, Colour blindness, Synaeresis of vitreous, Allergic conjunctivitis, Corneal opacity and Iris melanoma.]	
Total	209 (12.67)

Students with less than 6/60 vision, in any one eye is 0.9%.

Table 2 depicts the associates of ocular morbidity among students. It shows that increasing age and metropolitan habitat are significantly associated with ocular morbidity whereas sex and socio-economic status did not have such association.



Table – 2:

Distribution of Ocular Morbidity according to different Socio-demographic variables among Madrasah students of Kolkata(N= 1649)

Variables	Total students	Ocular Morbidity Number (%)	Significance Z, X ² / p value
1. Age (Years)			
Up to 10	129	21 (16.28)	X ² _{df2} =17.22 / p < .01
11-14	1357	152 (11.20)	
>14	163	36 (22.08)	
2. Sex			
Boys	562	59 (10.5)	Z = 1.83 / p = 0.067
Girls	1087	150 (13.8)	
3. Habitat			
Metropolitan	970	184 (18.96)	Z = 9.11 / p <.01
Green & serene	679	25 (3.68)	
4. Socioeconomic status			
Class I& II	21	03 (14.28)	X ² _{df2} =1.328 / p=0.515
III	127	12 (9.44)	
IV & V	1501	194 (12.92)	

Discussion:

The overall prevalence of ocular morbidity was found to be 12.67% in the present study with refractive errors being the commonest, 9.40%. The commonest refractive error was myopia with an overall prevalence of 7.76%, which was lower than a similar study conducted at R.I.O Kolkata on general school children, by Das *et al* [9]. Comparative rates of prevalence of refractive error were found in a study conducted in North Maharashtra^[10] and rural Delhi [6].

No significant difference was observed in the prevalence of myopia in boys and girls (6.58% vs. 8.37%, Z= 1.19, p= 0.234). This is similar to study results of Garner *et al* [11]. Similar pattern was also observed for astigmatism (1.42% vs. 2.94%, Z= 1.73, p= 0.083) but, hypermetropia was significantly higher in boys (1.24% vs. 0.27%, Z=2.08, p= 0.038). Amblyopia was the most

important cause for uncorrected visual loss, mostly caused by refractive error, the present study shows a prevalence of 1.09%. This is similar to prevalence rate observed in Saudi Arabia [12] (1.07%-1.85%).

Ingram RM^[13] reported that hypermetropia was significantly associated with esotropia. However the present study did not observe any such association, probably due to small number of esotropic cases. It has also been observed that madrasah children exposed to greener conditions had significantly lesser refractive errors (1.21% vs. 8.18%, Z = 7.43, p <.01), possibly indicative of a beneficial effect of fresh pollution free environment to ocular morbidity.

Present study revealed a significantly increasing trend of ocular morbidity with increasing age of the student. This could be attributed to, longer hours of study or eye work, greater exposure. The trend was

similar for students residing in metropolitan environment.

Conclusion:

Majority of ocular morbidity were either preventable or treatable. Refractive error being the commonest. If detection is early in the course, prevalence of ocular morbidity can be greatly reduced. Prevalence of childhood blindness / low vision in India is 0.8 per thousand^[14], simply because of the fact that a child cannot properly

express; this can be controlled or reduced by spreading awareness and organizing periodic school eye screening programs. Special attention should be given to madrasah children as they belong to weaker section of our society. It was also observed, that myopia was the most common refractive error, both in 'urban' and 'rural' communities, although in rural environment, the prevalence was lesser. But still, it raises a pertinent question, is myopia a rising public health problem?

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