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ORIGINAL RESEARCH

Prevalence of ocular morbidities among school going children in rural population of Maharashtra

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ABSTRACT
Community based cross sectional study was undertaken to assess prevalence of ocular morbidities among school going children in a rural population of Maharashtra for two years. Where 400 school going children participated in study. This study revealed that Prevalence of ocular morbidities was found to be 23.5%. Study also observed that determinants such as number of family members, socio-economic status, literacy status of father and mother of school going children were mostly associated with ocular morbidity among school going children in rural population.
Key Words - Prevalence of ocular morbidity, school going children, rural population.

INTRODUCTION

"I shut my eyes and all the world drops dead; I lift my eyes and all is born again." - Sylvia Plath, The Bell Jar.

"Good sight brings clarity to a great visual experience." - Wayne Chirisa.

Worldwide, childhood blindness accounts for the second largest cause of blind-person years, after cataract. Globally approximately 70 million blind-person years are caused by childhood blindness. Out of around 1.4 million blind children worldwide, 270,000 are estimated to be in India. Uncorrected refractive errors are a significant cause of avoidable visual disability, especially in developing countries.

The available data suggests that there may be a tenfold difference in the prevalence ranging from as low as 0.1/1000 children aged 0–15 years in the wealthiest countries to 1.1/1000 children in the poorest. Since 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.[2]Children and adolescents comprise amajor 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 errorscan have detrimental effect on theacademic, social and later the functional potential of individuals.[3]

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. Effective methods of vision screening in school

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children are useful in detecting correctable causes of decreased vision, especially refractive errors and in minimizing long-term visual disability. [4]

Common eye related problems in school children are, Refractive errors, amblyopia, squint, vitamin A deficiency, allergicconjunctivitis, ocular infections, and less commonly congenitalcataract glaucoma.[3] Majority of the population inIndia, still lives in rural areas. Health consciousness is much less in the rural population as compared to its urban counterpart. [5] The major cause of blindness in children varies, being largely determined by socioeconomic development, and the availability of primary health and eye care services.[6]

More importantly, information on the prevalence and causes of blindness and severe visual impairment in children is needed for planning and evaluating preventive and curative majors for children. Effective methods of vision screening in children are useful in detecting correctable causes of visual dysfunction and in minimizing long-term visual disability.[7] The pattern of ocular diseases varies in different part of the world and is influenced by racial, geographic, socioeconomic and cultural factors.[8]

NEED FOR THE STUDY

Children do not complain of defective vision and may not even be aware of their problem. They adjust to the poor eyesight by sitting near the blackboard, holding the books closer to their eyes, squeezing the eyes and even avoiding work requiring visual concentration. This warrants early detection and treatment to prevent permanent disability. Children in the school-going age group (6-16 years) represent 25% of the population in the developing countries. They offer significantly representative material for these studies as they fall best in the preventable blindness age group.[7]

As there is huge revolution in technical advances in mobile, television, video games and its increased use among school going children. Many school going children are suffering from visual impairment in very early age. Screening access is easier in urban areas but same among rural areas is unknown, so keeping this in mind & to know the prevalence of ocular morbidities among school going children of rural population, this study was planned.

AIM

To find prevalence of ocular morbidities among school going children in rural a population of Maharashtra.

OBJECTIVES

1. To assess prevalence of ocular morbidities amongschoolgoing children in a ruralpopulation.
2. To find out factors associated with ocular morbidities.

MATERIAL AND METHODOLOGY

1. **Study design:** The present study is a community based cross sectional study.
2. **Study setting:** The study was carried out in school going children from 1st to 10th standardin a rural population of Maharashtra.
3. **Ethical considerations:** Ethical committee approval was obtained from the Institutional ethicalcommittee prior to the start of the study.
4. **Study duration:** The present study was carried out over a period of 2 years from 1ST November 2019 to 30th December 2021.
5. **Study population:** 400 school going children in a rural populationofMaharashtra were selected by systematic random sampling andenrolled in the study as per following inclusion and exclusion criteria.
6. **Inclusion criteria:**

a) Students from1st to10th standard in a rural population of Maharashtra.

b) Students willing to participate for study or Guardian of the student permitting them for study.

7. **Exclusion criteria:**

a) Absent students at the time of interview.

8. **Sampling Technique and Sample Size:** There are 780 school going children were present in study area from which 50% of school going children were selected for the study by systematic random sampling. Sample size of the study was 400 school going children.
9. **Data collection:** All study subjects were identified with the help of social health care worker by house-to-house survey. Before data collection one month training for identifying common ocular morbidities was taken at ophthalmology department. The Preliminary examination of school children was done at the rural health center. The data collection instrument was a pretested structured questionnaire. Detailed history, including family history, about the current problems and past problem was recorded. Beside the socioeconomic and demographic factors; Height and weight of the child was noted. Height was measured to the nearest 0.5 cm using a measuring tape. Weight was measured using an electronic weighing scale. Modified B G Prasad`s classification was used to find socio-economic class. Ishihara's isochromatic chart was used to identify the cases of red-green color blindness.

The visual acuity was tested by Snellen’s chart for far vision keeping it at six meters distance from the subjects, and near vision was tested with the help of Jaeger’s chart keeping the distance of 25-30cm from the eyes of the subjects. In cases of poor visual acuity (<6/9), a pinhole vision was taken to differentiate refractive errors from posterior chamber pathology.

Visual acuity of 6/9 in any one eye was taken as a sign of visual impairment. The refractive errors were screened. Examination of the eyelid margins and cilia,

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bulbar and tarsal conjunctivae, the cornea and anterior segment was done using a pen-torch and a 2x magnifying loupe. Latent squint was diagnosed by cover-uncover test. All ocular morbidities were confirmed by senior ophthalmologist at tertiary care hospital.

10. **Data compilation:** Collected data was entered into Microsoft-Excel 2010 worksheets andcoded appropriately.
11. **Data analysis:** Data was analyzed using Microsoft Excel 2010, Open EPI-Info Version 7.2. Data were expressed in percentages for categorical variables. Chi square test was used to observe the association of the ocular morbidities with respect to age, sex, socioeconomic class and other factors, p-value < 0.05 was considered significant.

OBSERVATION AND RESULTS

Study was conducted in one of a village under field practice area of a tertiary care hospital with 400(n) school going children. **Prevalence of ocular morbidities** was found to be **23.5%** among school going children in rural population of Maharashtra and following results and observations were found.

Table No. 1: Prevalence of ocular morbidities.

Ocular Morbidity	Student	Percentage
Refractive Error	41	41.46%
Vit A Deficiency	28	28.54%
Conjunctivitis	10	10.101%
Squint	9	9.09%
Eye Injury	3	3.03%
Blepharitis	3	3.03%
Pterygium	2	2.02%
Chalazion	1	1.01%
Stye	1	1.01%
Ptosis	1	1.01%
Total	99	100%

*Five students were suffering from more than one ocular morbidity.

Table No. 2: Factors Associated with Ocular Morbidity.

Variable	Categories / Levels	Total (n)	With Morbidity (n, %)	P-value	Significance	Detailed Interpretation
Age Group	6–10	273	69 (25.3%)	0.75	✗ No	Similar rates across all age groups. Not age-dependent in this sample.
	11–15	230	50 (21.7%)			
	16–20	13	3 (23.1%)			
Gender	Male	288	63 (22.1%)	0.33	✗ No	Slightly higher in females but not significant.
	Female	228	58 (25.3%)			
Family Size	1–5 members	287	81 (28.3%)	0.001	✓ Yes	Significant; smaller families had higher morbidity. May relate to parental attention.
	6–10 members	211	45 (21.3%)			
	11–15 members	18	2 (14.3%)			
Class of Schooling	Primary	211	50 (23.7%)	0.97	✗ No	No trend across class levels.
	Middle	192	45 (23.4%)			
	High	113	26 (23%)			
Socioeconomic Class	III	250	71 (28.4%)	0.004	✓ Yes	Significant; higher in middle-income (Class III). May reflect mixed access and risk.
	IV	217	49 (22.6%)			
	V	49	7 (14.3%)			
Mother's Education	Illiterate	172	56 (32.6%)	0.0005	✓ Yes	Strong negative association; higher education protective.
	Primary	178	41 (23%)			
	Secondary	103	19 (18.4%)			
	Higher Secondary	45	5 (11.1%)			
	Graduate & above	18	0 (0%)			
Father's Education	Illiterate	137	50 (36.5%)	0.00001	✓ Yes	Even stronger negative association than mother's education.
	Primary	161	37 (23%)			
	Secondary	134	24 (17.9%)			
	Higher Secondary	51	9 (17.6%)			
	Graduate & above	33	1 (3%)			

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DISSCUSSION

Current study showed that, out of 400 school going children, 94(23.5%) students were having presence of any ocular morbidities, and five (1.25%) students were suffering from more than one ocular morbidity. **Prevalence of ocular morbidities** was found to be **23.5%** among school going children in rural population of Maharashtra. As per individual morbidity which is given in **TableNo. 1**, **refractive error** found to be the most common ocular comorbidity which constituted **41.46 %** of all the ocular comorbidities. After that **vit A deficiency** constituted **28.54%** of all ocular comorbidities. **Conjunctivitis** constituted **10%** of whole ocular morbidities. Similar kind of results were obtained by **Deepanshu et al**[1] which showed prevalence of ocular morbidities as 21.2%. **Jayant et al**[4] showed prevalence of ocular morbidities in school going children as 27.65% in his study & also found that refractive error was the most common ocular morbidity (36.62%) followed by vit A deficiency which count for 25.58% of ocular morbidities. **Veer Singh et al**[2] also gave prevalence of ocular morbidity in school going children as 29.35 % in his study & major contributing factor for ocular morbidities was refractive error 18.36%. **Anindita et al**[23] have conducted study which showed prevalence of 16.2% in school going children. There are few studies which showed different results, study performed by **Pankaj Kumar et al**[8]has given the prevalence of ocular morbidity as 11.58% and here also refractive error was major the contribution to ocular morbidity. Study by **Mahesh et al**[22]gave prevalence of ocular morbidity as 10.8% with vit A deficiency as the major ocular morbidity.

From**Table No. 2** we see that there is no statistical association between age of school going children and ocular morbidity. Ocular morbidity is not affected by age of the school going student. **Anindita et al**[23] have conducted study in west Bengal with significant association between age and ocular morbidity and found that ocular morbidity is more common below 12 years of age. **Pankaj Kumar et al**[8] also gave the same finding, where ocular morbidity was more among 9-12years of age in school going children.

In this study out of the total 94 students with ocular morbidity. As per gender wise distribution in **Table No. 2, 52 males** and **42 females** were having ocular morbidity. It shows that there is no statistical association between the gender and ocular morbidity. So, ocular morbidity is present in both genders of school going children, and it was not affected by it. Similar kind of results were obtained by **Jayant et al**[4] which showed that there is no statistical association of gender and ocular morbidity in school going children. **Pankaj Kumar et al**[8] also gave the same finding in school going children. **Anindita et al**[23] had also given same result with school going children.

As per **Table No. 2** when we had distribution of students with ocular morbidity according to number of family members. There is **high statistical association** between number of family members and ocular morbidity. It shows that when there are high number of family members in family, there is less risk of having ocular morbidity. There are no studies which have shown association between number of family members and ocular morbidity.

Table No. 2 gives the distribution of ocular morbidity with socioeconomic class of the student as per Modified B. G Prasad classification[26]. Where chi square value is **8.08** and p value is **0.004.** So, there is statistically significant association between them. It means, students belonging to socioeconomic class III & IV have more risk of getting ocular morbidity than the students belonging to other socioeconomic class.Similar kind of results were obtained by **Jayant et al**[4] which showed that there was statistical association of socioeconomic class and ocular morbidity and students belonging to socioeconomic class IV had more risk of getting ocular morbidity. **Anindita et al**[23] had also given the same result with socioeconomic class III having more risk. **Pankaj Kumar et al**[8] showed that there is statistical association between socioeconomic class and ocular morbidity with p value of0.001 and it was more among socioeconomic class II.

We have also gathered data about education status of mother and father and their association to the ocular morbidity. **Table No. 2** represents the distribution of ocular morbidity with education of student's mother and father. There is high statistically significant association between them as p value is less than 0.05. It means, students with higher educated mother and father have low risk of getting ocular morbidity in given study area. **Pankaj Kumar et al**[8]in their study of 134 students with ocular morbidity also found the results as per present study. They found association of ocular morbidity with mother's and father's education status to be highly associated where high educated parent's children have less ocular morbidity. **Jayant et al**[4]also gave the similar finding with p value of 0.001.

CONCLUSION

The present study found the prevalence of ocular morbidities to be 23.5% among school-going children in the rural population of Maharashtra.

The analysis revealed significant associations between ocular morbidity and various socio-demographic factors, including the number of family members, socio-economic status, and the literacy levels of both the father and the mother. These determinants were observed to have a considerable influence on the ocular health of the children studied.Conversely, no statistically significant association was found between ocular morbidity and the age or gender of the participants, indicating that these variables may not be major contributing factors to the occurrence of ocular conditions within this population.

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RECOMMENDATION

It is recommended that a systematic and cyclical approach be adopted for the implementation of early eye screenings, referrals, and appropriate treatment for school-aged children.

Given the limited availability of research data on ocular comorbidities in school-aged populations, further studies are urgently required to better understand the scope and impact of these conditions.

In addition, targeted health education initiatives should be directed towards parents and guardians to increase awareness of common eye health issues. Emphasis must be placed on the importance of early detection, timely intervention, and the long-term benefits of proper eye care in childhood.

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