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Original Research Article

Prevalance and Distribution of Ocular Morbidities among High School Going Children in Chandrapur

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Abstract:

Background: Healthy vision plays an important role in academic success. School children are affected by various eye disorders like refractive errors, squint, Vitamin A deficiency and eye infections. Most children do not complain of defective vision, as they may not recognize such conditions as a problem. Uncorrected refractive errors form the primary cause for visual impairment and blindness in India. This warrants early detection and treatment of these problems to prevent future blindness.

Aims: The study was conducted to estimate the prevalence and distribution of ocular morbidities among high school going children in Chandrapur and to create 'eye-health awareness' among them.

Method: This was a cross-sectional study of school children of two schools in Chandrapur city. The students were screened for eye disorders by visual acuity testing, anterior segment torch light examination and eye movements.

Results: A total of 450 children were examined. The prevalence of ocular morbidity was 45%. Uncorrected refractive error was commonest morbid condition (27%) and Vitamin A deficiency was the second common morbidity (7%).

Conclusion: Regular eye screening programmes play a pivotal role in identification of ocular morbidities among high school going children. Hence, prompt and timely treatment can prevent future complications and childhood blindness. The eye health awareness among children, their parents and school teachers should be improved.

Keywords: Eye Screening, Ocular Morbidity, Refractive Errors, Vitamin A Deficiency, High School Children.

Introduction

Vision is closely linked to learning process. Healthy vision plays an important role in academic success. Nowadays, a child's education is not limited to just studying from textbooks and scoring good marks in board exams. Schooling is more about grooming, imparting practical knowledge, developing leadership skills and much more beyond academic knowledge. Health habits formed at this age will be carried to adult age, old age and even to the next generation. Any undetected problem often will cause trouble with schoolwork. Often children don't know they have vision problems because they do not understand when the problem begins. Such complaints go unnoticed to the parents due to lack of awareness, their busy schedule, etc.

Worldwide, childhood blindness accounts for the second largest cause of blind person years, after cataract. [1] 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. [2,3]

School health is an important aspect of any community health program. School children are affected by various ocular morbidities like refractive errors, squint, Vitamin A deficiency, conjunctivitis, external hordeolum, blepharitis, cataract, colour blindness etc. 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."[4] The presence of any of the ocular

morbidity not only affects the learning ability of a child but also has an impact on adjustment in school and personality development as a whole. This warrants early detection or treatment of ocular morbidities to prevent future blindness.

No such study was undertaken previously at community level among high school going children in Chandrapur. We wanted to study the pattern of ocular morbidity in high school going children in the age group of 12 to 18 years to detect correctable causes of decreased vision and to create the awareness in parents, teachers and children.

Methods:

A cross sectional community-based study was carried out in higher school going children of age group 12-18 years. The study was undergone between January 2023 to June 2023. Convenient sampling was done. Sample size was calculated by using formula $4pq/L^2$. Considering p=44, q=56 and allowable error (L) =10% of p, required sample size was 383 for the study. Adding 10% to the allowable error we arrived at a final sample size of 421. Hence, we have selected two schools to achieve this sample size. At the time of actual data collection, 450 students have given consent to appear for clinical examination. So statistical analysis was done on 450 sample size.

The ethical clearance was obtained from the Institutional ethics committee of our institute. The students of the two schools of Chandrapur city were included in the study excluding the absent students on the day of examination. The principals and the teachers of the school were informed and explained about the study and written permission for the screening program was obtained in advance. The principals in turn communicated to the parents by WhatsApp media. Consent forms were also distributed among the children and asked to bring it back after signing from their parents. The children who were not able to bring back the signed consent form or were absent on the day of screening were excluded from the study. For the analysis the children were divided into two groups of 12-15 years and 16-18 years of age. Gender wise distribution was also taken. Firstly, general data regarding age, sex socio economic status, personal cleanliness, etc. was collected using pre-designed and pre-tested questionnaire. Information was obtained from the children in local language and entered in English in the questionnaire.

The students were inquired about the symptoms like decreased or blurred vision, double vision, difficulty in reading, headache, pain in or around eyes, redness of eyes, any discharge from eyes, etc. The clinical examination of eyes was done. The visual acuity testing using Snellen's chart for distant vision and Jaegar's test types for near vision were used to screen for refractive error. Pin hole test was also performed to distinguished defects in optic apparatus or neural path in myopic children. Vitamin A deficiency was diagnosed if there was history of night blindness or on anterior eye segment examination by torch light, there were signs of conjunctival xerosis, Bitot's spots, corneal xerosis or keratomalacia. Squint and concomitant strabismus were assessed by ocular movements in medial rotation, lateral rotation, elevation, depression and binocular conjugate movement.

The data obtained was analyzed by using statistical software stata version 18. The Chi-square test was used to test differences in proportions. The difference was considered to be statistically significant if $p<0.05$.

Results:

A total of 450 children were examined for ocular morbidities belonging to two schools. The prevalence of ocular morbidity was 45%.

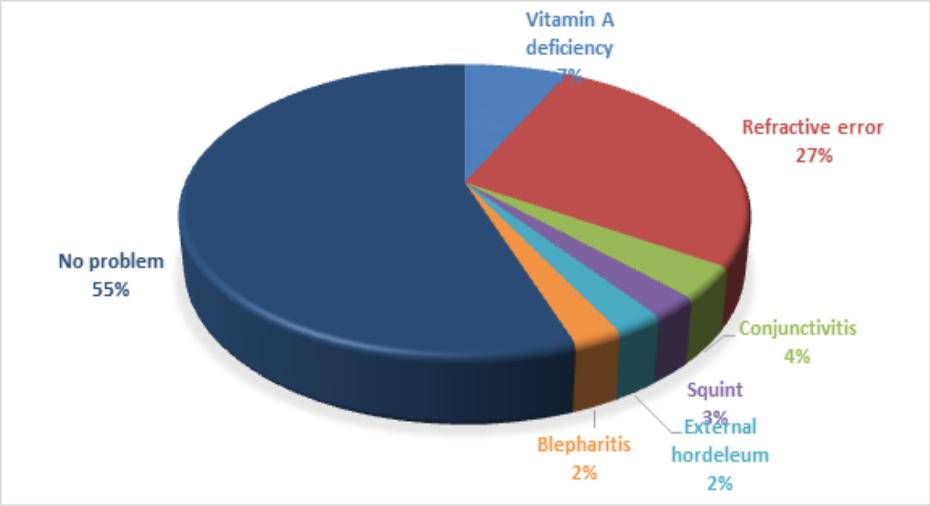

Diagram 1: Distribution of ocular morbidities among study group.

Diagram 1 shows the distribution of ocular morbidities among study group.

Table1 and Table 2 show sexwise and agewise distribution of ocular morbidities.

Table 1: Sexwise distribution of ocular morbidities

Sr.	Ocular morbidities	Male	Female	Total
1.	Vitamin A deficiency	12	12	24
2.	Refractive error	28	64	92
3.	Conjunctivitis	9	8	17
4.	Squint	7	4	11
5.	External hordeleum	8	4	12
6.	Blepharitis	7	4	11
7.	No problem	167	116	283

Table 2: Distribution of ocular morbidities according to age groups

Sr.no.	Ocular morbidities	12-15 years	16-18 years	Total
1.	Vitamin A deficiency	16	8	24
2.	Refractive error	34	58	92
3.	Conjunctivitis	12	5	17
4.	Squint	5	6	11
5.	External hordeleum	7	5	12
6.	Blepharitis	3	8	11
7.	No problem	183	100	283

Ocular morbidity was more common in female school going children as compared to boys. This difference was statistically significant (chi-square value= 11.46, P=0.0007).

Refractive error was the commonest morbidity and found to be more in girls as compared to boys. This difference was statistically highly significant (chi-square value= 11.35, P=0.0008). Also, it was more in older (16-18 years) age group as compared to younger (12-15 years) age group. This difference was statistically highly significant (chi-square value=20.55, P= 0.0001).

Vitamin A deficiency and conjunctivitis were found more in younger age group as compared to older age group but was not found statistically significant.

Discussion

The present work, conducted in 12-18 years old high school going children of Chandrapur, confirms the high prevalence of ocular morbidity (45%) with significantly more in females. This study is consistent with the study by B. T. Prasanna Kamath done in 6-15 years school going children in rural area of Karnataka (44.77%). [5] This is also consistent to the one reported by Kalikivayi et al (43.5%). [6] A study by Chaturvedi et al [7] reported more than 40% prevalence, which was also comparable with our study. Gupta et al [8] in their Shimla based study reported little low (31.6%) prevalence. The study from West Uttar Pradesh by Veer Singh et al has reported similar but low prevalence of ocular morbidity (29.35%) with more in females (29.37%) [9].

In our study, Refractive error was the commonest ocular morbidity (27%) and found to be significantly more in girls. These results were comparable with the study of Das *et al*. [10] in Kolkata (with a prevalence of 25.11%.) and Biswas et al [11] who also found refractive error as the most common disorder, with a prevalence of 23.67%. Gupta *et al*., [12], Desai *et al*. [13] in Jodhpur and Veer Singh et al in West Uttar Pradesh [9] reported the prevalence of 22%, 20.8% and 17.36%, respectively. International studies conducted by Shrestha *et al*. [14] reported a similar prevalence of refractive error in their 2006 study (21.9%) . This difference might be due to different diagnostic criteria used for detection, variance in reading habits and living conditions among various population groups, and a difference in the sample size. The gender difference in refractive error could be due to less importance and ignorance given towards a female child in a family and also girls' tendency to hide their problems.

Also, there was a significant rise in refractive errors with increasing age, which was comparable with a study conducted by Kumar *et al*. [15] This could be due to increase in awareness among children with age, which enables them to talk about their problems more openly with the doctor, resulting in higher reporting of ocular problems among older children (16-18 years of age). Again, this could be due to the increased mobile, laptop, television, I-pad usage, etc resulting in the increase in screen time in high school going children in post pandemic period as an impact of Covid-19. However, study conducted by Desai *et al*. [13] reported a decline in the ocular morbidity with increasing age, which did not match with the results of our study.

The prevalence of Vitamin A deficiency was found to be 7% in our study. Bhattacharya *et al* observed comparable results with 8.16% prevalence of vitamin A deficiency among primary school students in Darjeeling district [16]. Desai *et al*. [13] and Gupta *et al*. [12] found Vitamin A deficiency prevalence of 5.39% and 1.8% in their respective

studies. A study conducted by Lu *et al*. [17] in China reported the least prevalence of 0.65%. This difference could be due to difference in race, region and weather conditions or due to a smaller sample size in their study. In younger age group, Vitamin A deficiency was found more but not significant. This was probably due to better eating habits as they grew up.

The present study revealed conjunctivitis, squint, external hordeolum and blepharitis to be prevalent in 4%, 3%, 2% and 2% children respectively. These ocular morbidities were found more in younger age group as compared to older age group but was not statistically significant. Delhi‑based study by Kumar *et al*. [15] and Jodhpur‑based study by Desai *et al*. [13] reported bacterial conjunctivitis with a higher prevalence of 4.6% and 5%, respectively. These are more likely to be associated with poor personal hygiene. A higher prevalence of strabismus was reported by Lu *et al* [(17] (2.49%), Baltimore vision screening project[18] (3.1%), Shrestha *et al*. [14] (3.5%), Gupta *et al*. [12] (2.5%), Pratap and Lal [19] (2.87%). Younger children are either afraid or are unable to express themselves due to which many diseases go unnoticed. Hence, children in younger age group should be regularly, thoroughly, and patiently examined so that early detection can be done and long‑term visual impairment can be reduced. [20]

Conclusion:

This study revealed that the prevalence of ocular morbidities was significant among high school going childrenin Chandrapur region. Refractive error was the most common ocular morbidity and found to be high in girls and older age group. Vitamin A deficiency was also identified to be high in the younger age group.

Since high school going children form a sizeable segment of the community and are easily accessible, regular eye screenings play a pivotal role in identification of preventable and treatable causes of the ocular morbidities. Whereas, school teachers serve as good counsellors to parents and students, frequent awareness and training programs should be conducted for them so that they can identify the visual problems and refer them for the timely treatment. The comprehensive eye health care programs should be implemented effectively in the school to promote the importance of ocular health and its care, healthy diet, proper reading habits, good hygienic practices, etc. Regular use of spectacles and decrease in screen time may also help to improve this morbid situation. Hence, prompt and timely management can prevent future complication and childhood blindness.

Exposure to screen and its correlation with ocular morbidity and serum analysis of Vitamin A are the limitations of our study.

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