

Ocular Morbidity in School Children in Western Part of Maharashtra

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ABSTRACT

Introduction: The control of childhood blindness is one of the most important priorities of Vision 2020 – since disability-adjusted life years loss in a blind child is much more than that of the adult. **Aims:** The aim of this study was to know the prevalence and types of ocular morbidity among school children in a Rural Medical College Hospital. **Settings and Design:** Cross-sectional hospital-based study was carried out at a tertiary institute after Ethical Committee approval. **Materials and Methods:** A total of 504 school children visiting ophthalmology and pediatric outpatient department of hospital, satisfying the inclusion criteria were included in the study. Informed consent and/or assent were taken as required. Demographic data, medical history, pre-existing ocular conditions, and patients symptoms were recorded. Visual acuity, refraction, and detailed ocular examination including fundus examination were done and findings were documented in the performa and analyzed using the Statistical Package for the Social Sciences software. **Results:** Refractive error as ocular morbidity (20.24%) was highest, followed by strabismus (2.38%), conjunctivitis (1.59%), trachoma (0.79%), Vitamin A deficiency (0.99%), and ptosis (0.4%), chalazion (0.59%) and sty (0.4%). For strabismus, conjunctivitis, trachoma, Vitamin A deficiency (0.99%), chalazion, etc., no statistical difference was found in different age groups and sex ($P > 0.05$). **Conclusion:** Refractive errors were the most common cause of ocular morbidity (27.38%) among school children in our study as the most common ocular disorder.

Key words: Ocular morbidity and children, pediatric blindness, refractive errors, and children

INTRODUCTION

Impairment of vision is a worldwide problem that has a considerable socioeconomic impact. "Ocular Morbidity" is defined as the spectrum of both visually impairing and non-visually impairing ocular conditions.^[1] Many types of ocular disorders such as refractive

error, conjunctivitis, squint, trachoma, consequences of Vitamin A deficiency, sty, chalazion, trachoma, trauma, blepharitis, and squint are found commonly in childhood. Uncommon conditions include amblyopia, ptosis, glaucoma, proptosis, cataract (congenital, developmental, or traumatic), and corneal opacities. Rarer forms of ocular morbidities include retinal degenerations, congenital anomalies of the eye, cancers of the eye and adnexa, systemic diseases, and their ocular manifestations.

Childhood blindness (CHB) is one of the major public health concerns across the world accounting for the second largest cause of blind-person years, after cataract.^[2] Range of prevalence in various studies varies from 4.92% to 44.7%.^[3-15] The prevalence is reported to be as high as 1.5/1000 children in low-to-middle-income countries in comparison of high-income

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countries where the prevalence is 0.3/1000.^[16] Factor that can affect the prevalence of blindness is not only the methodology used for community-based surveys but also the location in which the study is conducted like an urban or rural setting.

Blindness in children leads to a deep impact on mental, emotional, and socioeconomic growth. Moreover, the disability-adjusted life year's loss is much more in a blind child compared to adults with blindness.^[17]

Therefore, the control of CHB is the most prioritized objective of Vision 2020 - Right to Sight initiative. Percentage of avoidable blindness is <50% in children unlike adulthood blindness that is 80% avoidable (either preventable or treatable).^[18]

The importance of early detection and treatment of ocular disease and visual impairment among young children is obvious^[19] for the fact that 30% of India's blind lose their eyesight before the age of 20 years and many of them are under five when they become blind.

Causes of blindness and visual morbidity in children along with prevalence data are needed for planning preventive and curative strategies for the children, including plans for visual rehabilitation.

Undetected ocular diseases in child may lead to academic failure, thus school screening is cost effective in detecting ocular morbidities.^[20]

By knowing the prevalence and causes of visual impairment in children, it is necessary to plan for and implement preventive and curative treatments such as correction of refractive error, surgeries for the pre-existing diseases, special education, and low vision services.^[7]

Therefore, the present observational study was planned to study the types and prevalence of ocular morbidity in school children which will help in judiciously allocation of resources, tailored to the needs of the community.

Aims and Objectives

The aims of this study were as follows:

- To know the prevalence and types of ocular morbidity among school children around Rural Medical College Hospital
- Early detection and management of ocular morbidities.

MATERIALS AND METHODS

The present cross-sectional hospital-based study was carried out at a tertiary institute to study the prevalence

and types of ocular morbidity among school children. The study was conducted after obtaining clearance from the Ethical Committee of the institute-wide IEC/624 dated December 22, 2020, and permission from the appropriate authority. A total of 504 school children from standards I to X visiting ophthalmology and pediatric outpatient department of the hospital satisfying the inclusion criteria were included in the study.

Considering ocular morbidity of 12% from the previous study and with 90% confidence limit and allowable error of 20% the estimated sample size was 504. Only those students who were not willing for ophthalmic check-up were excluded rest the children were included in the study. Informed consent and/or assent were taken as required from the participants.

Methodologys

Demographic data from students and parents were collected including name, age, sex, and personal details. Detailed history of patients complaining of any symptoms was taken including relevant past medical history and pre-existing ocular conditions. Visual acuity was recorded with the help of Snellen's chart with and without spectacles and improvement with pinhole was also recorded followed by ocular examination with the help of torch and magnifier when necessary. Convergence was also tested. Fundus was examined with a direct ophthalmoscope without dilating the pupil. Whenever necessary, refraction and fundus examinations were done after instilling cycloplegic eye drops. In children up to 06 years of age, Atropine 1% ointment was used as cycloplegic. In older children, either Homatropine 2% or Cyclopentolate 1% was used for refraction. Spectacles were prescribed. Children with refractive error were asked to follow-up yearly. Amblyopia treatment was advised wherever necessary. Children having convergence insufficiency were asked to do convergence exercises. Other ocular disorders such as stye, chalazion, ptosis, lid and orbital disorders, adnexal disorders, ocular surface disorders, anterior and posterior segment disorders, and squint were managed as per the requirement. Education regarding proper illumination, ocular hygiene, and trauma was imparted. Examination findings were documented in the Performa and analyzed. The data obtained was entered into Microsoft Excel Worksheet and it was analyzed using the Statistical Package for the Social Sciences software for Windows version 23.

RESULTS

Distribution according to Age among Children

The maximum number of children were in the age group of 11-15 years (47.42%), followed by <10 years (44.04%). The mean age among children was 12.8 ± 3.26 years.

Distribution according to Gender among Children

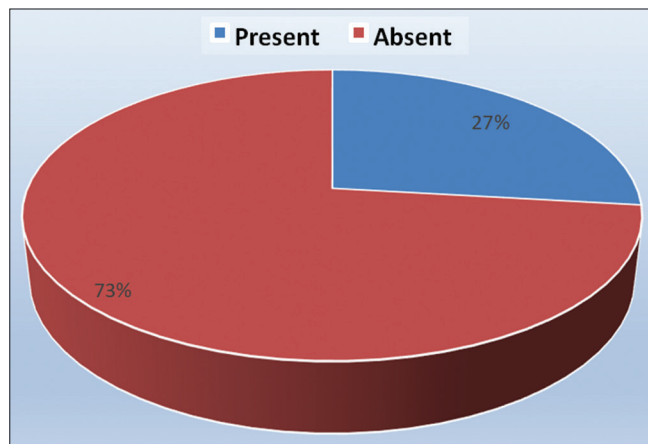
The maximum number of children were boys (55.16%), followed by girls (44.84%).

Overall Ocular Morbidity among Children

It was observed that the prevalence of ocular morbidity among children was 27.38% [Graph 1] and the maximum children were in age group of 11-15 years (49.28%), followed by <10 years (30.43%). The prevalence of ocular morbidity among children was more among boys (52.17%) as compared to girls (47.83%).

Distribution according to Type of Ocular Morbidity among Children

The [Graph 2] shows ocular morbidity distribution among children. It was observed that the majority of children have refractive error as ocular morbidity (20.24%), followed by strabismus (2.38%), conjunctivitis (1.59%), trachoma (0.79%), Vitamin A deficiency (0.99%), and ptosis (0.4%).



Graph 1: Distribution according to ocular morbidity among children

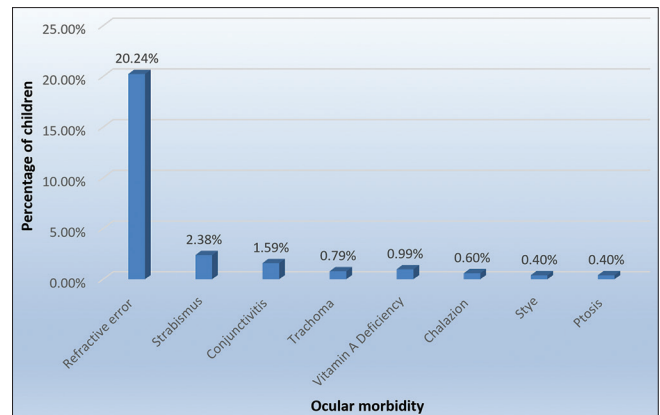
Association of Ocular Morbidity and Age among Children

A total number of 23, 48, and 31 children were found to have refractive errors in <10, 11-15, and >15 year age group, respectively [Graph 3]. It was observed that there was no statistical significance between age and ocular morbidity ($P > 0.05$).

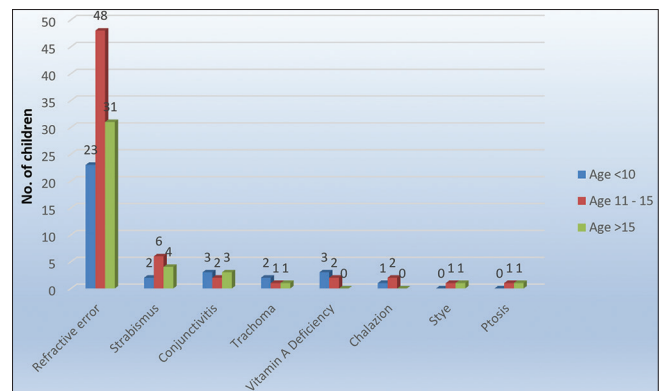
Association of Ocular Morbidity and Gender among Children

Refractive errors cases seen were 56 and 46 among boys and girls and for strabismus, it was seven and five, respectively. The [Graph 3] shows the association of ocular morbidity and gender among children.

For strabismus, conjunctivitis, trachoma, Vitamin A deficiency, chalazion, etc., no statistical difference was found in different age groups and sex.



Graph 2: Distribution according to type of ocular morbidity among children



Graph 3: Age-wise distribution of ocular morbidity

DISCUSSION

Ocular disorders are the fourth most common class of disability, handicapping children. The development of vision-screening programs in children has beneficial outcomes.

Age

In the present study, the maximum number of children were in the age group of 11–15 years (47.42%), followed by <10 years (44.05%). The mean age among children was 12.8 ± 3.26 years. The maximum numbers of children were 1st–4th standard (40.67%), followed by 5–7th standard (31.35%). Similarly, Shrestha *et al.*^[3] in a study on ocular morbidity among children observed the age of the students was between 4 and 20 years with the mean age of 12–13 years. It was observed that there was no statistical significance between age and ocular morbidity ($P > 0.05$).

Sex

The maximum number of children were boys (55.16%), followed by girls (44.84%). Reddy *et al* observed ocular morbidity in a total of 56.8% males and 43.1% females.^[21] Sinha and Dulani^[22] in her study of 530 children found 52.45% males and 47.55% females. Gupta *et al.*^[7] in a study on the prevalence of ocular morbidity among school children of age 6–16 years observed a total of 52.08% males and 47.91% females. These both findings were in accordance to our present study. Sehgal *et al.*^[23] also found no difference in the prevalence of ocular diseases among males and females in Delhi (males 46.1% and females 48.3%). However, a higher prevalence in females (73.5%) as compared to males (49.4%) was reported by Khurana *et al.*^[24] in Haryana. The prevalence of infectious diseases such as blepharitis, trachoma, and conjunctivitis was found high among girls and it was attributed to increased use of ocular cosmetics.

It was observed that there was no statistical significance among gender and ocular morbidity ($P > 0.05$) in our study.

Refractive Error

Irfan *et al.*,^[25] Dash *et al.*^[26] also found refractive errors as the most common encountered disorder.

Sinha and Dulani,^[22] in her study found (29.25%)

prevalence of refractive error as ocular morbidity, Gupta *et al.*^[7] (22.0%) and (20.24%) in our study.

Higher (32%) prevalence rate of refractive errors among school children of age 3–18 years from South India was found and this could be due to higher case detection by optometrist.^[15] However, Datta *et al.*^[27] reported a low prevalence of refractive errors (2%) from Eastern India among primary school children of 5–13 years, but this could be due to smaller age group covered in that study.^[15]

A lower prevalence rate of refractive errors (2.7–5.8%) has been reported internationally by countries such as Africa, Finland, Chile, and Nepal among 5–15 years in comparison of the present study.

In contrast studies of children of 3–15 years of age, the proportion of visual impairment due to uncorrected refractive error was very high 72.6% in Sydney, Australia,^[28] 75% in Beijing China,^[29] 78.6% in Sao Paulo Brazil,^[30] and as high as 94.6% in Guangzhou, China.^[31]

These differences in various studies could be attributed to the use of different age groups, different diagnostic criteria, variations in the prevalence of refractive errors in different ethnicity, variations in lifestyles or living conditions (preference of indoor games compared to outdoor games), availability and affordability of medical care (e.g. overcorrection of refractive errors), etc.

Ocular Morbidity

The prevalence of ocular morbidity among children was maximum in the age group 11–15 years (49.28%), followed by <10 years (30.43%) with maximum among boys (52.17%) as compared to girls (47.83%). There was no statistical significance found between ocular morbidity and age and ocular morbidity and gender ($P > 0.05$).

Higher prevalence of ocular morbidity has been reported from neighboring states such as Haryana (58.8% in 4–18 years) and Rajasthan (71.7% in 416 years) and also from Hyderabad in South India (43.5% in 3–16 years).^[14,15,24]

It was due to the higher prevalence of trachoma and conjunctivitis found in these two northern states and the high prevalence of refractive errors found in South India.^[15]

Gupta *et al.*^[7] observed overall prevalence of ocular morbidity 31.6% with no sex preponderance for overall prevalence of ocular morbidity. This finding was in accordance to present study. Similarly, Shrestha *et al.*^[3] observed the prevalence of ocular morbidity was 19.56% among the total number of school children.

Other Ocular Morbidities

Gupta *et al.*^[7] in a study on the prevalence of ocular morbidity among school children of age 6–16 years observed strabismus (2.5%), Vitamin A deficiency (1.8%), and conjunctivitis (0.8%). This finding was similar to the present study.

Squint

Higher (7.4% in 5–15 years) prevalence of squint has been reported from Haryana, Rajasthan, West Bengal and Delhi.^[14,24,27,32] while some studies have reported lower (0.2–0.6%) prevalence in 4–18 years of age.

Pratap *et al.*^[32] has reported prevalence as 2.8% for the primary squint and 0.42% that of paralytic squint.

In studies conducted in Tanzania, Africa, Wedner *et al.*^[10] also revealed a lower prevalence of squint (0.5%) by Wedner *et al.*, among children of 7–19 years of age.

Vitamin A Deficiency

In Rajasthan and Kolkata, Datta *et al.*^[27] has reported Vitamin A deficiency up to the extent of 5.4–9% in children of 4–16 years, respectively, as compared to 0.99% in the present study and (1.8%) by Gupta *et al.*^[7]

This can be explained by the difference in socioeconomic status associated with a dietary pattern of children in those studies, the availability of unadulterated food in rural versus urban areas. Reduction in prevalence of Vitamin A deficiency was found with advancement of age in the present study similar to the findings of Desai *et al.*^[33]

Conjunctivitis

Study by Robinson *et al.*^[34] in North America reported 1.5% prevalence of conjunctivitis among children of 1–17 years of age, similar to this study. However, higher (3–17.5%) prevalence was observed in studies conducted in different parts of India.^[14,33]

These variations in the prevalence could be due to personal and environmental hygienic conditions, differences in socioeconomic status, climatic conditions, and seasonal variations.

Congenital Disorders

Various studies have reported a low prevalence of these disorders from India.^[32,33]

CONCLUSION

The present study found a high prevalence of ocular morbidity (27.38%) among school children. Refractive errors were the most common ocular disorders. Health education activities should be intensified in schools and in the community regarding signs and symptoms of ocular disorders so that these children can be referred by caretakers. Screening program of school children should also be done at regular interval for early detection of ocular morbidity in children.

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