

ORIGINAL ARTICLE

Ophthalmic Morbidity in School Children in Hilly Areas of Uttarakhand

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Abstract

Introduction: School children constitute about one fourth of population of India. Early detection and treatment of various eye diseases helps in avoiding many complications. The magnitude of blindness is 3-4 times greater in developing countries. Very few studies have been conducted in Uttarakhand revealing the ophthalmic morbidity in school children or general population. Hilly areas especially the remote ones face various problems like, poor transportation facilities, distant health facilities, use of traditional methods for treatment, faith healing, customs and belief system, lack of information. Moreover water supply, poor personal hygiene and other factors also add up to these problems. **Aim:** To study the ophthalmic morbidities in school children in 3 schools of Thatyur block. **Methodology:** It was a cross sectional study. **Result:** A total of 705 students were enrolled. Permission from school authorities was sought before the start of study. Schools were visited twice in a week current and preliminary information was taken from the students & teacher regarding education, occupation, income etc. General examination and ophthalmic examination was done with day & torch light along with refraction, with the help of standard Snellen's chart. Each eye was examined separately. A vision of 6/6 was considered as normal. Near vision was tested with new vision Snellen's chart at 12-14 inches away from eye.

Key Words

Eye; Morbidity; Uttarakhand

Introduction

According to the WHO, there are 1.5 million blind children worldwide which account for about 5 percent of the total blind population globally. Poorest countries of Asia and Africa contribute 70 to 90 percent of the childhood blindness and the burden in these countries is about 3 to 4 times greater than that in developed countries. (1)

Many eye problems have their origin in childhood but may remain unnoticed and result into severe ocular disabilities affecting the child's educational performance, overall development and career opportunities. Majority causes of ocular morbidities among children like refractive errors, vitamin A deficiency, conjunctivitis, trachoma, ocular trauma, blephritis, stye and pterygium are either preventable or treatable.

Statistics indicate that 30 percent of the blind in India lose their eye sight before the age of 20 years. Considering the fact that about one fourth of our population is in the school going age and 80 percent of childhood blindness can be avoided, early detection and management of ocular morbidities among young children becomes imperative.

Hilly areas especially in the rural remote locations are faced with many problems particularly the lack of proper transport facilities, poor access to health facilities and reliance on traditional methods for treatment and faith healing. In addition, poor personal hygiene coupled with lack of awareness and adequate water availability also increases the chances of ocular infections and other morbidities in these settings.

Aims & Objectives

It was hence envisaged to study the prevalence and pattern of various ocular morbidities among school children in a hilly rural area of Uttarakhand.

Material and Methods

This cross sectional study was carried out in 3 schools of Thatyur block in Tehri District of Uttarakhand in August 2012. The study was carried out after obtaining requisite permission from the school authorities. The principals of the selected schools were informed about the study and their permission was sought personally. The principals of the selected schools informed and they took permission from the students' parents through school diaries. All the children present in the class at the time of visit in each school were examined in one sitting. A total of 705 students (240, 260 and 205 students each from the three schools respectively) belonging to age group 5 to 16 years were contacted and examined by a team comprising of qualified medical practitioner duly trained by a qualified ophthalmologist and other support staff. A pretested questionnaire was used to collect the information on the personal information and the presenting complaints of the children and record finding of the detailed examination of eye for diagnosing ocular morbidity and recording of vitamin A deficiency signs and their ocular manifestations.

Examinations were performed in the respective school compounds with due consideration to the length of the room (longer than 6 meters) and to the lighting. General examination and ophthalmic examination was done in the day light and using a torch. Refraction testing was done using a standard Snellen's chart. Each eye was examined separately and vision of 6/6 was considered as normal. For near vision new vision Snellen's chart was used at 12-14 inches away from eye. The WHO clinical staging for trachoma and xerophthalmia was used. (2, 3) Vitamin A deficiency was diagnosed if there was history of night blindness, or on examination there were signs of conjunctival xerosis, Bitot's spots, corneal xerosis or keratomalacia.

Data was analysed using Epi info 3.5.1 software. Chi-square test and fisher exact test were used to test differences in proportions and differences were considered to be statistically significant at the 5% level not reflected in results.

Results

The study was carried out on 705 students between ages 5 to 16 years with almost equal representation of children from all the age groups. Out of these, 406(57.6%) were males and 299(42.4%) were females. Response rate was 97.5%. The distribution of study subjects according to age and sex. ([Table No. 1](#)). With regard to the presenting complaints, watering of the eye (12.8%) was the most common complaint

amongst children followed by discharge from eyes (8.6%), redness of eye and headache (7.2% each), pain in the eye (6.8%), diminished vision (5.3%), itching (3.2%) and inability to see clearly in dim light (2.1%). Half of the children did not report any eye or related complaints when examined. ([Table No. 2](#))

On examination, 141(20%) subjects were identified to be suffering from some form of ocular morbidity. Refractive errors were found in 3% of the examined children. The most common cause of preventable blindness identified was related to vitamin A deficiency (7.5%) [Which included conjunctival xerosis (3.6%), Night blindness (2.3%) and bitot's spots (1.7%)]. Other preventable causes of blindness included blepharitis (3.6%), Conjunctivitis (2%), trachoma (1.3%) and chalazion (0.1%) ([Table No. 3](#), [Table No. 4](#), [Table No. 5](#), [Table No. 6](#))

Discussion

The present study was carried out on 705 students belonging to 3 schools in rural area in district Tehri with the aim of estimating the prevalence and pattern of morbidities among school children in such an area. The children in the three schools studied did not differ much in terms of culture, religion, ethnic values and socioeconomic status.

In present study half of the subjects complained of eye symptoms. However, on examination only one fifth of the children were found to be having some ocular morbidity. The prevalence of ocular morbidity among primary school children aged 5 - 15 years varies from 26.8% to more than 40% in rural areas of Delhi and 44.7% in rural area of Karnataka. In Maharashtra, 27.65% adolescents in age group 10-16 years were suffering from some form of ocular morbidity. The overall prevalence of ocular morbidity varies indifferent studies due to prevailing regional circumstances. As per WHO standards prevalence of night blindness >1% and that of bitot's spot >0.5% is considered as a public health problem among school children. (4) In our study the prevalence of signs and symptoms of vitamin A deficiency are much above the acceptable levels and hence warrant necessary action. Nine doses of Vitamin A are being administered at 6 monthly intervals to Children starting at 9 months of age. The high prevalence of vitamin A deficiency features in our study points to the need of relooking into our Universal Immunization Programme in terms of availability and administration of Vitamin A doses and putting emphasis on creating awareness regarding increasing intake of fruits and vegetables rich in Vitamin A.

Highlights the urgent need to implement at school level health facility-based, cost-effective strategies, and appropriate eye care programs targeting school

children to reduce the burden of visual impairment among the younger population.

The present study highlights a very high prevalence of ocular morbidity among school children in rural areas of Uttarakhand particularly the Refractive errors and Vitamin A deficiency. Other studies have also highlight significant childhood ocular morbidities due to these two conditions. (5-8)

The high prevalence of blepharitis, conjunctivitis and trachoma is due to prevailing poor hygienic conditions and need screening of school children should be a key component of an effective blindness prevention program. In context of WHO Vision 2020, the focus should be directed towards refractive errors and vitamin A deficiency in an endeavour to reduce childhood ocular morbidity as both conditions can be easily identified and promptly treated. From public health perspective, vision screening followed by corrective spectacles and vitamin A supplementation and nutritional counseling are very cost effective strategies to reduce the burden of childhood blindness.

Limitations

The vitamin A deficiency was only assessed clinically and not by assessment of serum vitamin A levels.

Conclusion

However, the result of our survey suggest that majority causes of ocular morbidity in children are preventable or treatable and hence the need for early detection through screening and appropriate management.

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Tables

TABLE NO. 1 DISTRIBUTION OF STUDY SUBJECTS ACCORDING TO AGE

Age (years)	Male n= 406 (%)	Female n=299 (%)	Total (%)
5-7	88 (21.08)	72 (24.08)	160 (23.7)
7-10	114 (28.07)	60 (20.06)	174 (24.68)
10-13	100 (24.63)	77 (25.75)	177 (25.10)
13-16	104 (25.31)	90 (30.10)	194 (27.51)
Total	406 (57.58)	299 (42.41)	705

TABLE NO. 2 DISTRIBUTION OF STUDY SUBJECTS ACCORDING TO PRESENTING COMPLAINTS-(356)

S. No.	Presenting Complaints	No. of students (%)
1.	Watering	90 (12.77)
2.	Discharge	56 (8.60)
3.	Redness	49(7.22)
4.	Headache	49 (7.22)
5.	Pain in eye	42 (6.8)
6.	Diminution of vision	35 (5.30)
7.	Itching	21 (3.16)
8.	Night Blindness	14 (2.07))
9.	None	349 (49.50)
	Total	705

TABLE NO. 3 DISTRIBUTION OF THE STUDY SUBJECTS ACCORDING TO OCCULAR MORBIDITIES (141) (N=705)

ICD Code	Morbidities	Total (%)
H53.0	Refractory error	21 (2.97)
H13.0	Trachoma	9(1.27)
H53.6	Night Blindness	16(2.27)
H11.1	Conjunctival Xerosis	25(3.6)
H13.2	Bitots spots	12(1.70)

H00.1	Chalazion	5 (0.07)
H00.0	Stye	10 (1.41)
H10.9	Conjunctivitis	14 (1.98)
H01.0	Blepharitis	25 (3.6)
H50.0	Squint	2 (0.28)
H17.8	Corneal opacity	1 (0.14)
H26.0	Cataract	1 (0.14)
	Normal	564 (80)
	Total	705

*morbidity are classified as per International Classification of Diseases version 10(ICD-10) 89

TABLE NO. 4 DISTRIBUTION OF OCULAR MORBIDITIES ACCORDING TO SEX:

ICD Code	Morbidity	Males-61 (n=406)	Females-80 (n=299)	Total (%) 705
H53.0	Refractory error	7(1.72)	14(4.68)	21 (2.97)
H13.0	Trachoma	5(1.23)	4(1.33)	9 (1.27)
H53.6	Night Blindness	7(1.72)	9(3.01)	16 (2.27)
H11.1	Conjunctival Xerosis	11(2.70)	14(4.68)	25 (3.6)
H13.2	Bitots spots	4(0.98)	8(2.67)	12(1.70)
H00.1	Chalazion	3(0.73)	2(0.66)	5 (0.07)
H00.0	Stye	5(1.23)	5(1.67)	10 (1.41)
H10.9	Conjunctivitis	6(1.47)	8(2.67)	14 (1.98)
H01.0	Blepharitis	9(2.21)	16(5.35)	25 (3.6)
H50.0	Squint	2(0.49)	--	2 (0.28)
H17.8	Corneal opacity	1(0.24)	--	1 (0.14)
H26.0	Cataract	1(0.24)		1 (0.14)
	Normal	345	219	564 (80)
	Total	406	299	705

TABLE NO. 5 DISTRIBUTION OF THE OPHTHALMIC MORBIDITIES AS PER THE AGE

ICD Code	Morbidity	Age in Years				Total (%) (n=705)
		<7 (n=160)	7-10 (n=174)	10-13 (n=177)	13-16 (n=194)	
H53.0	Refractory error	1 (0.62)	5 (2.87)	4 (2.25)	11 (5.67)	21 (2.97)
H13.0	Trachoma	2 (1.25)	3 (1.72)	3 (1.69)	1 (0.51)	9 (1.27)
H53.6	Night Blindness	11 (6.87)	5 (2.87)	--	--	16 (2.27)
H11.1	Conjunctival Xerosis	18 (11.25)	5 (2.87)	2 (1.12)	--	25 (3.6)
H13.2	Bitots spots	12 (7.5)	--	--	--	12(1.70)
H00.1	Chalazion	1 (0.62)	--	4 (2.25)	--	5 (0.07)
H00.0	Stye	1 (0.62)	1 (0.57)	5 (2.82)	3 (1.54)	10 (1.41)
H10.9	Conjunctivitis	2 (1.25)	2 (1.14)	4 (2.25)	6(3.09)	14 (1.98)
H01.0	Blepharitis	3 (1.87)	7 (4.02)	9 (5.08)	6(3.09)	25 (3.6)
H50.0	Squint	1 (0.62)	-	1 (0.56)	--	2 (0.28)
H17.8	Corneal opacity	1 (0.62)	--	--	--	1 (0.14)
H26.0	Cataract	1 (0.62)	--	--	--	1 (0.14)
	Total morbidity	52 (33.12)	28 (16.09)	33 (18.64)	27 (13.91)	141 (20)
	Normal	107	146	144	167	564 (80)
	Total	160	174	177	194	705

TABLE NO. 6 DISTRIBUTION OF PREVENTABLE OPHTHALMIC MORBIDITIES

ICD Code	Morbidity	Total (%)
H13.0	Trachoma	9 (1.27)
H53.6	Night Blindness	16 (2.27)
H11.1	Conjunctival Xerosis	25 (3.6)
H13.2	Bitots spots	12(1.70)
H00.1	Chalazion	5 (0.07)
H10.9	Conjunctivitis	14 (1.98)
H01.0	Blepharitis	25 (3.6)
	Normal	564 (80)

Figures

FIGURE NO. 1

