

Study of visual morbidity among the school going children in rural part of Central India

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Abstract

Background: Visual morbidity is an important factor affecting the learning ability, personality and confidence of growing children. Early detection and treatment of visual morbidity is an easy way to improve child health and development.

Aims: 1) To estimate the prevalence and causes of visual morbidity in children. 2) To create awareness about the preventable causes of childhood blindness.

Methodology: Cross-sectional, School-based screening; Study site: 4 Schools in the radius of 20km around our Institute; Duration: Six months; Age group: 5-15 years (Both sexes); Sample Size: 896.

SPSS software was used for statistics. ICD-10 codes are used to classify diseases.

The parents were counselled and awareness was generated regarding the importance of early detection and treatment of eye diseases.

Result: Ocular morbidities were observed in a total of 30.69% (279 children); Uncorrected refractory error was the most important cause; Unilateral refractory errors accounted for 19.35%; Bilateral errors formed the rest 31.18%.; Vitamin A deficiency which included Bitot's Spots (21.14%) and Conjunctival Xerosis (11.11%) was the second common cause.; There were 3 cases of colour blindness diagnosed using Ishihara chart (1.07%); Significant association with socio-economic status and occupation of parents ($p < 0.05$).

Conclusion: Visual morbidity affects the various domains of child health and development. Hence, there appears a dire need for early detection and treatment.

Keywords: Visual Morbidity, Children, Rural, Central-India, Prevalence.

1. Introduction

Visual morbidity is an important factor affecting the learning ability, personality and confidence of growing children. Its causes vary from abnormal eye development to acquired causes of reduced vision. The treatable causes of visual morbidity in children include refractive errors, congenital/developmental cataract, Vitamin A deficiency and infections of ocular adnexa.

Approximately 90% of the world's visually impaired people live in the developing countries. An estimated 19 million children are visually impaired, out of which 12 million have refractory errors [1]. These conditions can be easily diagnosed and corrected with timely interventions.

Reports show that 30% of India's blind lose their sight before the age of 20 years, thus early detection and treatment of visual morbidity and impairment in young children is important [2]. Early and thorough eye screening at the school level is useful method to attain this goal. Also it will help us in improving health at large.

Schools are excellent platforms to impart knowledge and create awareness among children. The primary aim of the present study was to determine the various causes of visual morbidity among children and create awareness amongst the parents regarding the treatable causes of reduced vision.

1.1 Aims and Objectives

- 1) To estimate the prevalence of visual morbidity in children.
- 2) To study the various causes of visual morbidity.
- 3) To create awareness about the preventable causes of childhood blindness.

2. Material and Methods

2.1 Type of study: Cross sectional

2.2 Study site: 4 Schools in the radius of 20km around our Institute

2.3 Sample Size: 896 (Sample size was calculated by using the formula $4pq/L^2$)

2.4 Duration of study: Six months

It was a Cross-sectional, School-based screening undertaken to find out the prevalence and causes of visual morbidity in children

2.5 Inclusion criteria

- 1) All school children who were present on the day of examination.
- 2) All children whose parents showed willingness to participate in the study and gave consent voluntarily.
- 3) Age group: 5-15 years
- 4) Both sexes

2.6 Exclusion criteria

- 1) Children who were absent on the day of examination.
- 2) All children whose parents did not consent for the study
- 3) Mentally retarded children, in whom proper visual acuity recording was difficult.

Four rural schools were selected randomly such that they were within the radius of 20 km from our institute. The study was conducted under PSM School health camps. Five days were allotted to each school, after proper consent and permission from the respective in-charges. Consent forms were distributed for parental consent which were collected on the next day wherein the study was explained to them all. Also, those who gave consent were asked to fill in the demographic details for assessment via Kuppuswamy’s Socio-economic scale.

The study was conducted among children in the age group of 5-15yrs.

Table 1: Groups of Patients

Name of the school	Total children examined		Total
	Males	Females	
A	126	101	227
B	101	120	221
C	112	103	215
D	111	122	233
Total	450	446	896

The following ocular examination was conducted:

- o Visual acuity measured using Rosenbaum’s pocket chart.
- o Colour vision recorded with the Ishihara’s colour plates.
- o Torch light examination (anterior segment).
- o Extra-ocular movements recorded in all cardinal gazes, cover-uncover tests and convergence test also performed.
- o Referred to tertiary care hospital for correction of refractory errors, cataract, squint or any other significant finding for further evaluation and management.

SPSS software was used to evaluate and analyze the collected data. ICD-10 codes are used for the purpose of classification of diseases.

The parents were counselled and awareness was generated with the help of charts and posters regarding the importance of early detection and treatment of eye diseases.

3. Result

The age distribution of the population screened was 5-15 years. Sample size was 896 children from 4 rural schools in Nagpur District. Ocular morbidities were observed

in a total of 30.69% (279 children). It was observed that very few in the screened sample of students actually had ophthalmic complaints or blurring of vision.

Table 1: The sex distribution of the population screened

Sex distribution	Total	Percentage
Male	450	50.22%
Female	446	49.78%
Total	896	100%

(n=896)

Table 2: The age distribution

Age group	Number of children	Percentage
5-8	250	27.9%
9-11	339	37.83%
12-15	307	34.26%
Total	896	100%

(n=896)

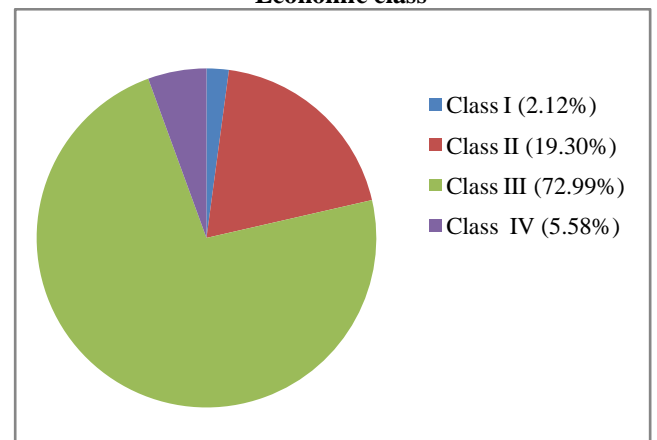
Table 3: Occupational distribution of parents for the purpose of socio-economic class

Occupation	Number	Percentage
Cultivators/ Farmers	51	5.69%
Landless labourers	651	72.65%
Service (Govt. /Private)	174	19.41%
Others	20	2.23%
Total	896	100%

(n=896)

The information regarding occupational distribution of parents for the purpose of socio-economic class is described in table no. 3 and as observed, most parents were landless labourers, followed by servicemen.

Figure 1: Kuppuswamy scale: Distribution of Socio-Economic class



(n=896)

Figure 1 is used for the description of socio-economic distribution of the children screened. The majority falls in the Class IV of modified Kuppuswamy scale.

Table 4: Ocular morbidity

Number of children with ocular morbidity	279	30.69%
Number of children with normal ocular findings	617	68.86%
Total	896	100%

(n=896)

As observed from the study (sample size 896 children) 279 children were found to have ocular morbidity of any form. The total prevalence thus observed is around **30.69%**.

Table 5: Observations regarding ocular morbidities and their distribution

ICD Codes	Causes of Morbidity	No. of patients	%
H 52.7	Refractory Error :Unilateral	54	19.35%
	Bilateral	87	31.18%
E 50	Vitamin A deficiency: Bitot's Spots	59	21.14%
	Conjunctival Xerosis	31	11.11%
H 10.9	Conjunctivitis	11	3.94%
A 71.9	Trachoma	2	0.7%
H 00.0	Lid infections: Stye	10	3.58%
H 00.1	Chalazion	8	2.86%
H 50.9	Squint	10	3.58%
H 04.209	Epiphora	3	1.07%
S05.90XA	Traumatic Injury	1	0.35%
H 53.5	Colour Blindness	3	1.07%
Total		279	100%

(n=896)

The important observations regarding ocular morbidities and their distribution have been tabulated as table 5.

- Of all the children with ocular morbidity, uncorrected refractory error was the most important. It accounted for 50.53% of total ocular morbidity.
- Unilateral refractory errors accounted for 19.35% while bilateral errors formed the rest 31.18%.
- Vitamin A deficiency which included Bitot's Spots (**21.14%**) and Conjunctival Xerosis (**11.11%**) was the second common cause.
- Lid infections like Stye (**3.58%**) and Chalazion (**2.86%**) were next in line.
- The causes like conjunctivitis resulted in **3.94%** morbidity while Trachoma, a major cause of preventable blindness accounted for **0.7%**.
- Squint was found to contribute **3.58%**.
- Children complaining of epiphora were **1.07%** of the whole.
- Traumatic penetrating injury was found in one child (0.35%).
- There were three cases of colour blindness diagnosed using Ishihara chart. (**1.07%**)
- The prevalence of ocular morbidity showed significant association with socio-economic status and occupation of parents ($p < 0.05$), while no significance was evident between the sex of the children and ocular morbidity.

4. Discussion

Children and adolescents are a major group in our population, hence their normal growth and development is of prime importance. The study of ocular morbidities and their causes is essential because such ailments have a direct effect on the physical, mental and social adaptations of children. Due to lack of knowledge and ignorance about symptoms, most cases of preventable or treatable blindness go unnoticed. Hence, mass screening at school level and public awareness programs may prove useful.

This study has found a prevalence of 30.69% in rural parts of central India. The sample size was 896 children. The study conducted by Deshpande *et al*[2] about Prevalence of ocular morbidities among school children in rural area of North Maharashtra in India showed 27.65% prevalence with a sample size of 645 in a school based survey. Study done by Rajesh Kumar *et al*[4], Ocular Morbidity amongst Primary School Children in Delhi with a school based sample size of 775 found prevalence of Visual morbidity to be 22.7%, with refractive errors accounting for the maximum morbidity. Jaya Biswas[5] *et al* in her study Ocular Morbidity among children at a tertiary eye care hospital in Kolkata had a sample size of 714 and age group <15 years.

In the present study, refractory errors were found to be most important and accounted for 50.53% of total ocular morbidity followed by Vitamin A deficiency which included Bitot's Spots (21.14%) and Conjunctival Xerosis (11.11%). Deshpande *et al*[2] also found that the main causes were refractory errors (36.62%), Vitamin A deficiency (25.58%) which are treatable. Certain other causes found in both studies included Squint, Injuries, Conjunctivitis, which were again curable. They state that there is a relation of diet and socio-economic class with the prevalence of ocular morbidity. Shrestha *et al*[7] in their study: Ocular Morbidity among children attending Government and Private Schools from Kathmandu[7] found 19.56% prevalence of ocular morbidity. A study by Ayanniyi *et al*[6] Causes and prevalence of ocular morbidity among primary school children in Ilorin, Nigeria[6] concluded that Nigeria had 19.9% prevalence.

Rajesh Kumar *et al*[4] found that the major morbidity was refractive errors. The sex distribution in the study was 58.26% males and 41.74% females, 70.73% children belonged to the age group of 10-14 years. The sex distribution in the current study is 50.22% males and 49.78% females with 71% children in the age group of 9-15 years of age.

It was also observed in the current study that there is a relation of diet and socio-economic class with the prevalence of ocular morbidity. Clare *et al*[8] presented a study from surveys in Asia, Africa and Latin America[8], the result stated that the causes were related to age and parental education.

Thus the results are relevant with local studies but prevalence of ocular morbidity in India is far more as compared to other countries. Hence, need of intervention is emphasized.

Strength of the study lies in the fact that early detection of treatable causes of ocular morbidity will help in child health development. Also, the fact that parents are being counselled will help in penetrating the thought better in the society.

The limitation of the study is due to the site, children were screened at rural schools hence thorough examination and use of Snellen's chart was not possible.

5. Conclusion

The study reveals a significant prevalence of ocular morbidity among school going children 30.69%. Refractory errors accounted for 50.53% of total ocular morbidity found while, Vitamin A deficiency accounted for 32% of total morbidity. These causes are treatable. Visual morbidity affects the various domains of child health and development. Hence, there appears a dire need for early detection and treatment.

There is a need to educate people collectively through health facilities, media, government and non-governmental organizations with emphasis on the importance of ocular health. Schools are an excellent platform to educate children and their parents regarding eye care and signs of morbidity. More extensive efforts in this direction will help us achieve the goals of VISION 2020.

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