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

Kotwal Neha N* and Nikose Archana

Department of Ophthalmology, NKP Salve Institute of Medical Sciences, Nagpur (M.S.), India

*Correspondence Info:
Dr. Neha N Kotwal
NKP Salve Institute of Medical Sciences, Nagpur (M.S.), India
E-mail: nehankotwal@gmail.com

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 Ishiara 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.
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:
- Visual acuity measured using Rosenbaum’s pocket chart.
- Colour vision recorded with the Ishihara’s colour plates.
- Torch light examination (anterior segment).
- Extra-ocular movements recorded in all cardinal gazes, cover-uncover tests and convergence test also performed.
- 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%       |

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%       |

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%       |

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

- Class I (2.12%)
- Class II (19.30%)
- Class III (72.99%)
- Class IV (5.58%)

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 | Percentage |
|----------------------------|--------------------|------------|
| Number of children with ocular morbidity | 279                | 30.69%     |
| Number of children with normal ocular findings | 617                | 68.86%     |
| Total                      | 896                | 100%       |
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  | E pepphora                | 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 Ayamiy 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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