Research Paper

# Prevalence of Ocular Morbidity in School Going Children of 

 Rural Area in Northern India
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## ABSTRACT

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Introduction: - Rural children are less aware about decreased vision. School screening programs are best way to detect the magnitude and pattern of problem. Methods:- Present study of 2500 students, of age group 5-13years randomly selected from 17 rural schools of district Amritsar during the academic session 2014-15, and were examined for ocular morbidity. Results:- The prevalence of ocular morbidity was observed in 11.8\%. Commonly observed morbidity was refractive errors in ( $6.8 \%$ ) with Myopia (4.52\%) being the most common refractive error. Squint and conjunctival xerosis were observed to be 0.96\% each, followed by allergic conjunctivitis ( $0.8 \%$ ). Conclusion: - Importance of regular school eye screenings should be duly recognised to protect the children having poor access to medical services.

## KEYWORDS : Ocular Morbidity, school going children, rural area

## INTRODUCTION

By the age of 6 years the retinal function are considered to be potentially well developed and matured enough with little scope for further enhancement of this entity at cellular level. Normal vision from birth is necessary for normal binocular development. Failure to detect and treat amblyopia, marked anisometropia or strabismus at an early age may result into an irreversible functional and cosmetic visual deficit which may lead later to restriction in educational and occupational opportunities ${ }^{(1)}$.

The concept of avoidable blindness has gained increasing recognition during recent years. The impairment of vision due to refractive error and its possible correction by glasses or other method of intervention to restore vision within normal limits is a typical example of avoidable visual handicap.

Undetected refractive error in childhood may lead to behavioral problem and adversely affect social interaction and performance (academic or sporting) at school. Diagnosis of refractive error in school going children and its timely and proper correction saves permanent disability ${ }^{(2)}$.

Prevalence of visual impairment in children varies from as low as $2.72 \%$ in South Africa to as high as $15.8 \%$ in Chile. Less than $1 \%$ prevalence of refractive errors was reported in primary school children in rural Tanzania, $1 \%$ in Katmandu, $14.8 \%$ in Malaysia. ${ }^{(3-7) .}$

Various studies have been conducted by various authors at different times taking different quantum of samples in different regions in different age groups of children and have expressed their respective views in relation to clinical manifestations, causes, social impact prevalence and prevention of ocular abnormalities in children. In spite of all this consensus evades them and individual preferences are applied.

The present study was aimed to find out prospective and comparative analysis of ocular problems in 5-13 yrs age group children in urban
and rural area schools in district Amritsar of Punjab state in Northern India.

## AIMS AND OBJECTIVES

- To find out visual status in school going children.
- To find out the incidence of various types of refractive and colour perceptions defects in school going children in rural area.
- To provide professional guidance to the parents of the child depending upon the type of the refractive error and colour perception defects.
- To sensitize the school management regarding importance of early detection and management of visual problems in children.


## MATERIAL AND METHODS

- 2500 school children from 17 schools located in rural areas of district Amritsar were randomly selected.
- The complete ophthalmic examination was conducted, giving particular emphasis on the visual acuity, colour vision status and ocular muscle function.
- Distant vision was estimated as per Snellen's chart standard. Near vision was estimated as per the jaeger's chart standards and colour vision was estimated as per the Ishihara chart standards.
- Visual acuity <6/9(snellen's) and improving at least by one level through pinhole was considered to be due to refractive error.


## OBSERVATIONS

Table 1: Gender-wise distribution of ocular morbidity in rural school going children.

| Gender status | No. of affected children |
| :--- | :--- |
| Boys | $147(5.8 \%)$ |
| Girls | $148(5.9 \%)$ |
| Total | $295(11.8 \%)$ |

Table 2: Distribution of eye lid disorder in rural school children.

| S. No. | Eye lid <br> disorder | No of affected <br> boys | No of affected <br> girls | Total |
| :--- | :--- | :--- | :--- | :--- |
| 1 | Blepharitis | $4(0.16 \%)$ | $2(0.08 \%)$ | $6(0.24 \%)$ |
| 2 | Stye | $3(0.12 \%)$ | $5(0.2 \%)$ | $8(0.32 \%)$ |
| 3 | Chalazion | $3(0.12 \%)$ | $4(0.16 \%)$ | $7(0.28 \%)$ |
| Total |  |  | $10(0.42 \%)$ | $11(0.26 \%)$ |

Among various eye lid disorder stye was the most common followed by blepharitis and chalazion. There was no significant difference in the incidence of eye lid disorders among boys and girls of rural schools.

Table 3: Distribution of conjunctival disorders in rural school children.

| S. No | Conjunctival <br> disorder | No. of <br> affected boys | No of affected <br> girls | Total |
| :--- | :--- | :--- | :--- | :--- |
| 1 | Trachoma | 0 | $4(0.16 \%)$ | $4(0.16 \%)$ |
| 2 | Mucopurulent <br> conjunctivitis | $8(0.32 \%)$ | $7(0.28 \%)$ | $15(0.6 \%)$ |
| 3 | Allergic <br> conjunctivitis | $15(0.6 \%)$ | $5(0.2 \%)$ | $20(0.8 \%)$ |
| 4 | Conjunctival <br> xerosis | $8(0.32 \%)$ | $16(0.64 \%)$ | $24(0.96 \%)$ |
| 5 | Bitot spot | $2(0.08 \%)$ | $3(0.12 \%)$ | $5(0.2 \%)$ |
| 6 | Pterygium | 0 | 0 | 0 |
| Total |  | $31(1.24 \%)$ | $34(1.36 \%)$ | $65(2.6 \%)$ |

Table 4: Distribution of corneal disorders in rural school children.

| S. No. | Corneal <br> disorders | No of <br> affected boys | No of <br> affected <br> girls | Total |
| :---: | :--- | :--- | :--- | :--- |
| 1 | corneal opacity | $3(0.12 \%)$ | $1(0.04 \%)$ | $4(0.16 \%)$ |
| 2 | Corneal ulcer/ <br> foreign body <br> cornea | 0 | $1(0.04 \%)$ | $1(0.04 \%)$ |
| Total | $3(0.12 \%)$ | $2(0.08 \%)$ | $5(02 \%)$ |  |

Table 5: Distribution of ocular lens disorders in rural school children.

| S. No. | Lenticular disorder | No of <br> affected <br> boys | No of <br> affected <br> girls | Total |
| :--- | :--- | :--- | :--- | :--- |
| 1 | Dislocated/ <br> subluxated lens | 0 | 0 | 0 |
| 2 | Pseudophakia | $2(0.08 \%)$ | 0 | $2(0.08 \%)$ |
| 3 | After cataract | $2(0.08 \%)$ | 0 | $2(0.08 \%)$ |
| 4 | Aphakia | 0 | 0 | 0 |
| 5 | Congenital <br> cataract | $1(0.04 \%)$ | 0 | $1(0.04 \%)$ |
| Total |  | $5(0.2 \%)$ | 0 | $5(0.2 \%)$ |

Table 6: Distribution of latent Squint in rural school children.

| S. No. | Latent Squint | No of affected <br> boys | No of <br> affected girls | Total |
| :--- | :--- | :--- | :--- | :--- |
| 1 | Exophoria | $7(0.28 \%)$ | $5(0.2 \%)$ | $12(0.48 \%)$ |
| 2 | Esophoria | $2(0.08 \%)$ | $2(0.08 \%)$ | $4(0.16 \%)$ |
| Total | $9(0.36 \%)$ | $7(0.28 \%)$ | $16(0.64 \%)$ |  |

Table 7: Distribution of manifest ocular muscle imbalance in rural school children

| S. <br> No. | Manifest <br> squint | No of <br> affected <br> boys | No of <br> affected <br> girls | Total |
| :--- | :--- | :--- | :--- | :--- |
| 1 | Exotropia | $2(0.08 \%)$ | $4(0.16 \%)$ | $6(0.24 \%)$ |
| 2 | Esotropia | $2(0.08 \%)$ | 0 | $2(0.08 \%)$ |
| Total |  | $4(0.16 \%)$ | $4(0.16 \%)$ | $8(0.32 \%)$ |

Table 8: Distribution of color vision defect in rural school children

| Gender status | No of children affected |
| :--- | :--- |
| Boys | $8(0.32 \%)$ |
| Girls | 0 |
| Total | $8(0.32 \%)$ |

Table 9: Distribution of refractive errors in rural schools children.

| S. No. | Gender status | No of children affected |
| :--- | :--- | :--- |
| 1 | Boys | $82(3.28 \%)$ |
| 2 | Girls | $90(3.6 \%)$ |
| Total | $172(6.88 \%)$ |  |

Table 10: Degree of refractive error in rural school children.

| S. <br> No. | Visual <br> acuity | No of <br> boys | No of girls | Total |
| :--- | :--- | :--- | :--- | :--- |
| 1 | $6 / 6$ or <br> better | 1297 <br> $(51.88 \%)$ | 1030 <br> $(41.20 \%)$ | 2327 <br> $(93.08 \%)$ |
| 2 | $<6 / 6,6 / 9$ | $45(1.8 \%)$ | $40(1.6 \%)$ | $85(3.8 \%)$ |
| 3 | $<6 / 9.1$ <br> $6 / 12,6 / 18$ | $25(1 \%)$ | $37(1.48 \%)$ | $62(2.48 \%)$ |
| 4 | $<6 / 18$, <br> $6 / 24,6 / 36$ | $09(0.36 \%)$ | $09(0.36 \%)$ | $18(0.72 \%)$ |
| 5 | $<6 / 36,6 / 60$ | $02(0.08 \%)$ | $02(0.8 \%)$ | $4(0.16 \%)$ |
| 6 | $<6 / 60$ | $01(0.04 \%)$ | $02(0.84 \%)$ | $3(0.12 \%)$ |

Table 11: Distribution of refractive errors in rural school children.

| S. <br> No. | Refractive error | No of <br> affected <br> boys | No of <br> affected <br> girls | Total |
| :--- | :--- | :--- | :--- | :--- |
| 1 | Myopia | $52(2.08 \%)$ | $58(2.32 \%)$ | $110(4.4 \%)$ |
| 2 | Hypermetropia | $04(0.16 \%)$ | $10(0.4 \%)$ | $14(0.56 \%)$ |
| 3 | Myopic <br> astigmatism | $25(1 \%)$ | $17(.68 \%)$ | $42(1.68 \%)$ |
| 4 | Hypermetropic <br> astigmatism | $01(0.04 \%)$ | $05(0.2 \%)$ | $6(0.24 \%)$ |
| Total |  | $78(3.02 \%)$ | $90(3.6 \%)$ | $172(6.88 \%)$ |

Table 12 : Gender wise comparative incidence of children wearing corrective glasses

| Gender status | No of children wearing <br> glasses |
| :--- | :--- |
| Boys | $33(1.32 \%)$ |


| Girls | $41(1.64 \%)$ |
| :--- | :--- |
| Total | $74(2.96 \%)$ |

## DISCUSSION

The present study was conducted on 2500 school going children enrolled in schools falling within the jurisdiction in northern India children within 6-13 years of age, irrespective of sex were examined for any ocular morbidity.

Out of a total of 2500 children under study 1379 ( $55.16 \%$ ) were boys and $1121(44.8 \%)$ were girls. The overall incidence of Ocular disorders was seen in $11.8 \%$ (295) children.

The prevalence of conjunctival disorders was found $2.72 \%$ of rural school children. Conjunctivitis related to vitamin A deficiency was seen in $1.2 \%$ children including $0.68 \%$ cases of conjunctival xerosis and $0.01 \%$ cases of bitot spots. Only $0.21 \%$ cases had corneal disorders.

Amongst the lenticular disorders pseudophakia was seen in $0.04 \%$ cases. There was no case of aphakia and $0.04 \%$ cases of after cataract were observed whereas only $0.02 \%$ case of congenital
cataract was seen.
Squint (latent muscle imbalance and manifest squint):- Amongst Heterophorias, exophoria was most common ( $0.48 \%$ ) as compared to esophoria ( $0.16 \%$ ). Amongst manifest squint cases exotropia was more common ( $0.24 \%$ ) as compared to esotropia ( $0.08 \%$ ). Total incidence of strabismus was $0.96 \%$.

Colour blindness was seen in $0.32 \%$ of school children. There was no significant difference of incidence between urban and rural school children. Only boys were affected. The difference in results may be due to the ethnicity of the population under study.

Congenital globe anomalies were seen in $0.48 \%$ children with $0.2 \%$ cases of congenital ocular melanosis. There were $0.16 \%$ cases of iris naevus, $0.04 \%$ cases of epicanthal fold, $0.04 \%$ cases of congenital ptosis $0.04 \%$ cases of iris colobomas.

It is evident from the data in above that the incidence of congenital globe anomalies is low as reported in the present study as well as in other studies by various authors.

There were $6.68 \%$ children who had visual impairment ( $\mathrm{d} / \mathrm{v}<6 / 6$ ) due to refractive errors. The incidence in boys was $3.28 \%$ and amongst girls was $3.6 \%$. Out of total of $6.88 \%$ students, myopia was found to be the most common refractive error constituting $4.4 \%$ cases followed by myopic astigmatism $1.68 \%$, hypermetropia constituted $0.56 \%$ followed by hypermetropic astigmatism $0.24 \%$ cases in our study

The results of the various studies indicate that myopia is the commonest refractive error and myopic astigmatism is second common refractive disorder.

Awareness of visual disability:- Children wearing spectacles was $1.32 \%$ although the refractive error is less among rural school children awareness of their refractive error is also less.

## SUMMERY AND CONCLUSION

In the present study the incidence of ocular morbidity was $11.8 \%$ in rural school going children. Refractive error was the commonest and seen in $6.88 \%$ in rural school going children within the age group 5-13 years. $2.96 \%$ of rural school children were already aware of defective vision and were wearing corrective glasses. Incidence of conjunctival disorders was $2.72 \%$ \& conjunctival xerosis due to vita-min-A deficiency was more common ( $0.96 \%$ ) among conjunctival disorders. Colour perception defects were seen in $0.32 \%$ children and all were boys. The clinical manifestations due to refractive error can be minimised to great extent with timely detection and management by refractive correction particularly directing our efforts towards rural school children where the level of awareness is very low. Routine eye examination should be made mandatory either by teachers or by health care personals so that early detection and prompt treatment could be initiated and the child could be saved from manifestations
due to visual impairment.

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