FREQUENCY OF DECREASED VISION AND OCULAR DISEASES IN SCHOOL CHILDREN AT BANNU

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ABSTRACT

Objective: This study was done to assess frequency of ocular diseases and causes of visual impairment in children of a school at Bannu.

Study Design: Observational cross sectional survey.

Place and Duration of Study: A local high school at Bannu from March 2009 to May 2009.

Material and Methods: Students were asked to fill a structured questionnaire designed to encompass the symptoms of ocular diseases like history of impaired vision, use of glasses, headache and redness. Initial examination at school included assessment of visual acuity by Snellens chart, torch examination and cover uncover test. Subjects having unaided visual acuity less than 6/9 in worse eye, squint or redness were subjected to further examination including refraction and slit lamp biomicroscopy. SPSS version 15 was utilized to assess the data. Chi-square test was used to test differences in proportions.

Results: The 304 students (76%) were male and 96 (24%) were female. Mean age was 10.7 ± 2.8 years. Eighty five subjects (21.2%) were diagnosed to be suffering from some ocular disease but only 6.5% had any previous ocular consultation. Twelve percent (48) students had decreased vision on examination but its frequency in those with history of headache was significantly high (20%) compared to those with negative history (9.5%) (p value < 0.05). Refractive error was the cause of decreased vision in more than half of the cases. Vernal keratoconjunctivitis (VKC) was diagnosed in 2.8 % but its frequency was significantly high in those complaining of redness (12%) as compared to those not complaining of redness (1.1%) (p value <0.05). Blepharitis was also found to be a common disease affecting 3.3% of subjects.

Conclusion: Ocular diseases are very common in school going children of Bannu. Refractive errors, VKC and blepharitis constitute the majority of cases. Frequency of ocular consultation was quite low as compared to the load of eye diseases which necessitates consolidated effort to screen children at school level. As first step all children complaining of impaired vision, headache or redness must have an ocular consultation on priority bases.

Keywords: Decreased vision, Ocular disease, School screening.

INTRODUCTION

Children are a priority in vision 2020, WHO's initiative for prevention of avoidable visual impairment by year 2020. Impaired vision in childhood can have profound effects on learning ability, social interaction and employment opportunities later in life. Early diagnosis and treatment of ocular diseases can help the child grow into a useful member of society. That is why, vision screening is now routinely done in industrialized countries. Analysis of frequencies of severe visual impairment in pediatric population shows that there may be a tenfold difference in prevalence between the wealthiest countries of the world and the poorest, ranging from 0.1/1000 children aged 0-15 years in the wealthiest countries to 1.1/1000 children in the poorest[2]. Detection of visual impairment is not difficult and requires only simple equipment like Snellens charts. Additionally, it can be performed by adequately trained non medical staff like teachers under supervision[3]. One of the major causes of impaired vision during childhood are refractive errors, which are common and easily correctable. In our society, many children who require glasses are not using them which have great impact on their learning ability and personality development. Therefore, children should receive prompt and

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proper eye care for refractive errors and other eye diseases like strabismus, allergies and amblyopia to prevent permanent damage to visual acuity and binocular single vision[4,5].

Although early detection and treatment of ocular diseases with beneficial effects in school children is well documented[6], data on frequencies of such diseases is not readily available for this part of Pakistan. Keeping this in view, this study was conducted to determine the frequency and spectrum of childhood eye disorders. Results of this study will help in determining the impact of ocular morbidity on public health and can serve as useful template for planning eye care for children in a given region. This can also serve as guide while making polices such as implementation of vision screening programs.

MATERIAL AND METHODS

This study was carried out in Bannu from March 2009 to May 2009 at a local high school after approval of hospital ethical committee. All the enrolled children of the school were included in the study after informed consent. A structured proforma was filled for each subject which included demographic data pertaining to age, gender, residential address, class in which studying and any complaints related to eye including impaired vision, headache or redness of eyes. Furthermore, findings of the detailed examination of eye for diagnosing ocular diseases and visual impairment were endorsed.

A team comprising of one ophthalmologist and three nursing assistants trained in taking visual acuity (VA), equipped with Snellen's E chart, torches, autorefractometer, trial box, slit lamp, retinoscope and direct ophthalmoscope (Heine Beta 200) visited the school during working days of week for examination of the students. VA was checked by a nursing assistants using snellen's E chart at 6 meters while ophthalmologist performed torch examination and cover uncover test. Subjects having redness or squint were subjected to slit lamp examination, extraocular motility assessment, direct ophthalmoscopy and fixation test using David's star. Moreover, ophthalmologist rechecked the VA, performed auto-refractometery and subjective refraction in those students found to have decreased visual acuity on initial examination by the nursing assistants.

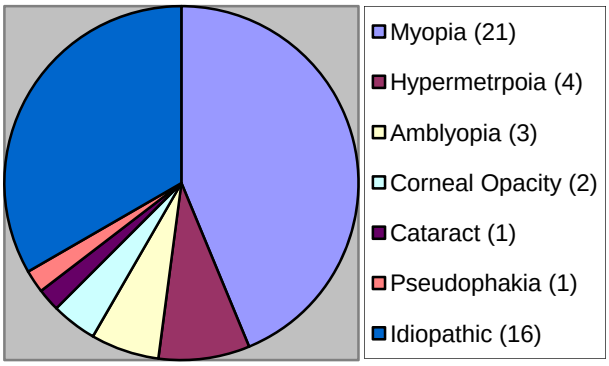

Figure-1: Causes of decreased vision among students (n=48).

Operational Definitions

Decreased Vision: unaided VA less than 6/9 in the worse eye.

Myopia: Spherical equivalent of refractive error more than -0.5 Diopter,

Hypermetropia: Spherical equivalent of refractive error more than + 1.00 Diopters.

Amblyopia: Best corrected VA two Snellen's lines less than the fellow eye after excluding organic problems by a careful examination.

Squint: Deviation more than 5 degrees on cover uncover test.

VKC: Presence of papillary reaction on upper tarsal conjunctiva and watery conjunctival discharge with or without Tranta's dots on slit lamp.

Data Processing and Statistical Analysis

All the data was entered into the SPSS version 15 and analyzed statistically. Students were divided in two groups comprising <10 years and those between 10-18 years. Frequency and means of the descriptive variables like age, gender, ocular morbidity and its causes, decreased visual acuity and its causes were

calculated. Differences in frequency of ocular diseases and visual acuity in both age groups were determined using chi-square test taking a *p*-value of <0.05 as statistically significant.

Table-1: Frequencies of ocular diseases within morbidity group.

Diagnosis	No	Percentage within morbidity group (n = 85)	Percentage in total (n = 400)
Refractive Errors	25	30%	6.2%
Blepharitis	13	15.2%	3.2%
VKC	10	11.7%	2.5%
Chalazion	5	5.9%	1.3%
Amblyopia	3	3.5%	0.75%
Episcleritis	3	3.5%	0.75%
Ptosis	3	3.5%	0.75%
Squint	1	1.2%	0.25%
Ectropion	1	1.2%	0.25%
Conjuntival neavus	1	1.2%	0.25%
Corneal opacity	2	2.3%	0.5%
Cataract	1	1.2%	0.25%
Pseudophakia	1	1.2%	0.25%
Idiopathic decreased vision	16	18.8%	4%
Total	85	100%	21.2%

Note: Morbidity group refers to all students with some ocular abnormality

RESULTS

A total of 400 students were included in the study with a mean age of 10.7 ± 2.8 with a range of 6-18 years. There were 304 (76%) males and 96 (24%) females with a male to female ratio of 3:1. Frequency of ocular morbidity was 21.2% and interestingly only 6.5% students had undergone any previous eye examination. A spectrum of ocular diseases was seen on detailed examination which is shown in table-1.

Decreased vision in at least one eye was found in 48 (12%) students out of which 31 (65%) subjects were unaware of their visual impairment. Frequency of decreased vision in those complaining of headache was 20% while it was only 9.5% in those not having headache (p <0.05).

Refractive errors were found to be the major cause of decreased vision affecting 25 subjects. It was interesting to note that out of these 25 students needing glasses, only 10 were using them while remaining 15 students were unaware of their refractive errors. Myopia was the most common refractive error 44% followed by hypermetropia 8%. Sixteen students having decreased vision on initial examination did not come for detailed evaluation. We have labeled those as idiopathic. Summary of the causes of decreased vision is shown Figure-1.

Ten students (2.8%) were found to have VKC. Fifty one subjects complained of redness of eyes out of which 12 % had VKC while only 1.1% of those not complaining of redness had VKC.

DISCUSSION

Vision is an important requirement for learning and communication[7]. Visual impairment due to uncorrected refractive errors and ocular diseases is a worldwide problem and contributes a lot towards childhood morbidity. Moreover, planning of the career is very much dependent on visual acuity, especially in jobs for the military, navy, aviation and railways. Permanent effects of ocular diseases on vision can only be prevented by early diagnosis through mass screening

programs for both school going and non school going children. Such screening activities are a routine in developed countries but in third world countries these are rare and sketchy. Few workers have conducted research in neighboring countries like China and India. To the best of our knowledge no work has been done in this area of Pakistan previously which was the motivation for this survey.

In this study the frequency of ocular morbidity was found to be 21.2% but interestingly only 6.5% had undergone any previous eye examination. This area of Pakistan is lacking institutionalized medical care while private facility is not an affordable option for many. Continuum of terrorist activities adds to the problems of this poor community. This explains why the results are higher than other countries like China 18.36%[8], India 7.4%[9], Chile 15.8%[10] and Nigeria 15.5%[11].

Twelve percent students were found to have decreased vision. Refractive errors were the most common cause affecting 52% of these. International and regional studies support this finding. In Nigeria, Ajaiyeoa AA et al found refractive errors to be responsible for 25.7% cases of ocular diseases in 1994[12]. Other authors report slightly higher frequency (37.3%) in the same country 7 years later[11]. We found myopia to be the most common refractive error followed by hypermetropia. This is consistent with the results of studies conducted in India[3] and Katmandu_ Nepal[13]. Whereas, few researchers in developed countries, show hypermetropia as most common refractive error[14]. The difference appears to be due to cycloplegic refraction which could not be done in our case. Amblyopia was responsible for 6%, other causes for 8% and idiopathic for remaining 34% of subjects with decreased vision. Dandona et al in India reported that refractive error was the cause in 61% of eyes with vision impairment, amblyopia in 12%, other causes in 15%, and unexplained causes in the remaining 13%[15]. We were able to found the cause for decreased vision in all the subjects coming for detailed examination. Sixteen students (34%) who were not willing for this examination were labeled as idiopathic. This explains the difference in this group between the two studies. Similar work was carried out by S H Wedner and his colleagues in Tanzania[16]. They found that 6.1% students had significant refractive errors. Myopia was the leading refractive error (5.6%). Amblyopia (0.4%), strabismus (0.2%), and other treatable eye disorders were uncommon. Only 30.3% of students with significant refractive errors wore spectacles before the survey. Comparison with our data presented in table-1 shows consistent results. But in our study we found that 40% of those with refractive errors were wearing glasses, which is slightly higher compared to the results of S H Wender. This frequency is still higher in some wealthier countries like Oman where Khandekar R has shown that 81% of those requiring glasses were wearing them[17].

It is a common observation that children do not complain of defective vision, and may not even be aware of their problem[18] but we observed that 40% of those complaining of impaired vision were found to have decreased vision while only 8.6% of those not complaining had it. We believe that if child feels impairment in vision, his complaints should be taken seriously. Similarly headache was also found to be important in this regard.

Regional conditions including environmental and socio-economic factors affect the pattern of prevalence of diseases. Few African studies show conjunctival diseases as the most common ocular morbidity[11] possibly because of high prevalence of trachoma in those countries.

Allergic conjunctivitis is an important disease of pediatric age group due to it's potentially vision threatening complications. We found 2.5% of the participants suffering from this disease but previous work in Karachi shows frequency as high as 19.2%[19]. Lack of environmental pollutants and industrial smoke in this area might be the reason. We found statistically significant correlation between

redness of eyes and allergic conjunctivitis. Twelve percent of those complaining of redness were diagnosed to have VKC. But only 1.1% of those not complaining of redness had VKC. Therefore any child complaining of redness should have ocular examination.

One of the limitations of study was that few students under treatment for diagnosed ocular diseases did not participate in the study, likely because of assumption that additional testing would be unnecessary. Thus actual frequency of ocular morbidity might be slightly higher than our estimates. Second limitation could be overlooking seasonal variation in the ocular morbidity as the study period mainly involved the month of March, April and May.

Present study is an important addition to the literature as it is the first to provide frequencies of ocular disorder in school children of Bannu region. The results of the study strongly suggest that screening of school children for ocular problems should be done at regular intervals and it should be one of the prime components of the school health program. For this, school teachers should be oriented and trained in identifying common eye problems among school children like visual impairment, headache and redness of eyes so that these children can be referred for prompt treatment. They should also impart awareness regarding ocular hygiene among school children. In this manner the incidence of decreased vision and ocular morbidity among school children will be minimized.

CONCLUSION

A high frequency of ocular morbidity among high school children was observed in Bannu. Refractive errors were the most common ocular disorders. School health programs should focus on the ocular health of children. This study will also serve as a pilot study for further work on large scale to determine prevalence of ocular disorders in children.

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