

Pattern of Ocular Problems in School going Children of District Lasbela, Balochistan

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Purpose: To find out the pattern of eye problems in children of age 6 to 15 years, attending schools and madaris (religious schools) and also to determine the difference in prevalence of ocular disease in students attending these different types of institutions.

Material and Methods: The study was conducted in Madaris of district Lasbela were screened from February 2008 to September 2009. All students of schools / madaris of district Lasbela were included in the study. The visual acuity (VA) was measured using standard Snellen's chart; external examination was carried out with the help of magnifying loop and direct ophthalmoscope. The children with VA < 6/12 were refracted to the best correction. The study team included a community ophthalmologist, an ophthalmologist, an ophthalmic technician and a community social worker. A structured questionnaire was prepared and operational methods were field tested and refined by piloting at the outpatient of Isra Postgraduate Institute of Ophthalmology, Al-Ibrahim Eye Hospital (AIEH), Karachi. An ophthalmic technician with community social worker checked vision of all the students and an Ophthalmologist examined the children for any abnormality and referred them to the base hospital (AIEH). All children with VA \leq 6/12 were refracted. Every school and madarsa of the target area was visited.

Results: Out of 25,437 examined school going children, 19,629 (77.16%) were found to be normal while 5,808 (22.84%) had ocular problems. The ocular conditions in order of frequency were conjunctivitis in 2,826 (11.10%) children, vitamin A deficiency disorders in 839 (3.29%) children, refractive error in 740 (2.90%) children, vernal conjunctivitis in 484 (1.90%) children, blepharitis in 373 (1.46%) children, strabismus in 119 (0.46%) children, cataract in 45 (0.17%) children, ptosis in 33 (0.12) children, nystagmus in 26 (0.10%) children, glaucoma in 2 (0.007%) children and non-specific ocular changes were found in 259 (1.01%) children. The prevalence of ocular problems occurred in 20.68% of children in main stream schools compared to 34.33% in children studying in madaris. The main difference in prevalence was of conjunctivitis noticed in 10.03% of school children, compared to 17% of madaris students and of refractive error present in 2.14% of school children, compared to 7% of students in madaris.

Conclusion: Almost 23% of school going children in Lasbela district needed treatment for their ocular problems. The prevalence of conjunctivitis and refractive error was more in madaris compared to schools. School screening could play an important role in the promotion of eye health and the prevention of childhood blindness.

Ocular problems, mainly leading to visual disability are important not because of the gross number but because of the number of blind years and its impact on the socio-economic condition of the community and country. The childhood blindness affects the entire family and many of them are left as street beggars in the poor countries. This has drawn the attention of World Health Organization's Vision 2020 program, which has included "Childhood Blindness" as one of its targets.

There are an estimated 1.4 million blind children in the world¹. One million of them reside in Asia. Every year, approximately half a million children add to this total (about one blind child every minute). The common causes of blindness in children are vitamin A deficiency disorders (VADD), refractive error, trachoma and hereditary / congenital diseases.

Baluchistan, the largest province of Pakistan, is in the southeastern region of the country. It is mountainous and dry, with population of about 6.5 million people². It is an under privileged province with poor health care, especially the eye care delivery. There are not many optical shops in most districts of Baluchistan and services for refraction are almost non-existing. The school going children have to suffer from this lack of eye care and this may be one of the important constraints towards achieving good literacy rate.

There are no reliable data available on the problems of school going children in Pakistan except a study by Afghani³ showing 4.24% of school going children having refractive error. There is a remarkable difference between mainstream schools and religious schools regarding socio-economic status, learning environment and "reading hours". In religious schools students are expected to have long recitation hours (about 10 hours a day) in contrast to schools (1-2 hours a day). This difference may have some effect on the growth of the eye resulting in the higher prevalence of refractive error.^{4,6} The purpose of our study was to determine the pattern of eye problems in government sponsored schools and madaris and to find out the difference of prevalence of eye conditions existent in these two different settings.

MATERIAL AND METHODS

All student age 6-15 years studying in government sponsored schools and madaris in Lasbela district of Balochistan were screened for the presence of any ocular problem from February 2008 to September 2009.

A team consisting of community ophthalmologist clinical ophthalmologist, ophthalmic technician and community social worker was formed and briefed about the structured questionnaire to collect the data and different aspects of the study. The team visited all the schools and madaris according to the schedule. The children examined belonged to the rural and urban areas, studying in primary, middle and high schools and madaris for girls and boys from the entire district Labella. About 100 students were examined per day. A total number of 25,437 school going children were examined. The visual acuity of each child was assessed using snellen's chart; the external ocular examination was carried out with magnifying loop and fundus was examined with direct ophthalmoscope after dilatation. A cycloplegic refraction was carried out in children with VA < 6/12. All children requiring glasses were provided spectacles and treatment was given for common ocular conditions like conjunctivitis and vernal conjunctivitis etc. The children with Xerophthalmia were provided vitamin A capsules and health education reading material. The children needing surgical intervention were referred to the tertiary eye care center at Isra Postgraduate Institute of Ophthalmology, Al-Ibrahim Eye Hospital, Karachi.

The permission for this study was sought from the education department of Lasbela district and the school headmasters/heads of madaris were requested to allow the screening. Efforts were made to educate at least one teacher in each school / Madrasa who could in the future check vision of the children. Snellen's charts were provided to each school without cost. The screening was conducted in the teaching institutions mainstream or religious, of the district Lasbela consisting of Hub, Winder, Dureji, Uthal, Liari, Lakhra and Belatahseels.

The data analysis was conducted with the statistical package for social sciences (SPSS) version (14.0) the values were presented in the form of frequencies and percentages and the proportion test was used to observe the significance. The difference between two groups (children of schools and madaris) was analyzed through Z-proportion test and p-value of < 0.05 was considered statistically significant.

RESULTS

We examined 21,432 school going children (6-15 years) in government sponsored schools and 4,005 students attending various madaris (total 25,437) with 2,487 students found absent.

Out of 4,005 students of religious schools, 1,375 (34.33%) and out of 21,432 students of state run schools, 4,433 (20.68%) had ocular problems. The ocular conditions in order of frequency were conjunctivitis in 2,826 (11.10%) children, vitamin A deficiency disorder (bitot's spots and Xerophthalmia) in 839 (3.29%) children, refractive error in 740 (2.90%) children, vernal conjunctivitis in 484 (1.90%) children, blepharitis in 373 (1.46%) children, strabismus in 119 (0.46%) children, cataract in 45 (0.17%) children, ptosis in 33 (0.12%) children, nystagmus in 26 (0.10%) children, glaucoma in 2 (0.007%) children and non-specific ocular features were seen in 259 (1.01%) children. The non-specific ocular changes included mild conjunctival redness and watering for which no specific reason was found. There was a considerable difference in the prevalence of eye problems between two institutions. The prevalence of ocular problems occurred in 20.68% of children in mainstream schools compared to 34.33% in children studying in madaris. The detailed examination (Table 1) showed that conjunctivitis, refractive error and vernal conjunctivitis were responsible for the main difference. The common eye ailment found was conjunctivitis (11.12%), more common in religious schools (17.07%) than in government schools (10.03%). Refractive error was found in 2.9% children. When considered separately, 2.14% children in government schools were found to be in need for correction with glasses, whereas 17.0% children in religious schools needed refractive correction. The overall prevalence of vernal conjunctivitis was 1.90%, with 1.62% children having it in schools compared to 3.33% pupils in madaris. The pattern of other eye disease was almost same in the two institutions. The p-value of all ocular problems in schools and madaris is mentioned in Table 1. The number of children referred to the base hospital was 261 (4.49%) from schools and 48 (3.4%) from madaris.

DISCUSSION

The prevention and control of blindness in children is considered a high priority by World Health Organization's Vision 2020; the Right to Sight Program.

There are 1.4 million blind children in the world and approximately 500,000 children become blind every year i.e. one every minute – and about half of them die within one or two years of becoming blind. The children who are born blind or who become blind and survive have a lifetime of blindness ahead of them, with all the associated emotional, social and economic costs to the child, the family, and the

society⁸. Indeed, the number of “blind years” due to all causes of blindness in children is almost equal to the number of “blind years” due to cataract in adults, which is around 70 million years.⁹ Unfortunately all these children remain uneducated and unskilled. In terms of economic loss, approximately one third of the total economic cost of blindness is thought to be due to childhood blindness. The control of childhood blindness is therefore also linked to the education and the poverty.

Many of the causes of blindness in children are either preventable or treatable. The conditions associated with the blindness in children are also causes of child mortality such as premature birth, measles, congenital rubella syndrome, vitamin A deficiency and meningitis. The control of blindness in children is therefore, closely linked to the child survival. Reducing visual loss in children poses particular challenges, which are different from the challenges of controlling adult blindness. The children are born with an immature visual system and for normal visual development to occur, they need clear, focused images to be transmitted to the higher visual center. The failure of normal visual maturation (Amblyopia) cannot be corrected in the adult life, so there is a level of urgency about treating childhood eye disease.

The major causes of blindness in children vary widely from region to region, being largely determined by the socio-economic development and the availability of primary health care and eye care service. The corneal scarring from measles, vitamin A deficiency disease, the use of harmful traditional eye remedies and ophthalmic neonatorum are the major causes in low-income societies. The retinopathy of prematurity is an important emerging cause. Other significant but less common causes are cataract, congenital abnormalities, and hereditary retinal dystrophies.¹⁰

Various studies have been done on childhood eye problems in Pakistan. Afghani and colleagues³ screened one million children; with main focus on prevalence of refractive error. Their study showed about 4.24% of children having various refractive errors required spectacle correction. Masood¹¹ looked at the various “institutions for the blind children” and found chorioretinal hereditary ocular disease involving 50.7% of children.

There is paucity of literature in finding the prevalence of ocular disorders in children studying in

madaris and comparing the ocular morbidity with children in government sponsored schools.

Table 1: Prevalence of eye diseases among children Age 6 - 15 in school and madaris of Labella district.

Diseases	Total	Schools	Madaris	P-value
Conjunctivitis	2826 (11.10)	2150 (10.03)	676 (17.00)	0.0001
VADD	839 (3.29)	713 (3.32)	126 (3.14)	0.557
Ref. Error	740 (2.90)	459 (2.14)	281 (7.0)	0.0001
Vernal conjunctivitis	484 (1.90)	349 (1.62)	135 (3.33)	0.0001
Blepharitis	373 (1.46)	315 (1.46)	58 (1.44)	0.917
Squint	119 (0.46)	97 (0.45)	22 (0.54)	0.412
Amblyopia	62 (0.24)	47 (0.21)	15 (0.37)	0.068
Cataract	45 (0.17)	37 (0.17)	8 (0.19)	0.711
Ptosis	33 (0.12)	31 (0.14)	2 (.04)	0.128
Nystagmus	26 (0.10)	23 (0.10)	3 (0.07)	0.555
Glaucoma	2 (0.0007)	1 (0.004)	1 (1.19)	0.183
Others	259 (1.01)	211 (0.98)	48 (1.19)	0.218
Normal	19629 (77.16)	16999 (79.3)	2630 (65.66)	0.0001
Total	25437 (100)	21432 (100)	4005 (100)	

The present study was conducted in all schools, managed both by the government and the religious bodies to cover all the children of school going age between 6-15 years in district of Balochistan (Lasbela). A total of 27,924 students were registered in the area schools. During screening, 2,487 students were found absent with 25,437 students available for ocular examination. It may be of some interest that 84.25% of the students were registered in state run school. Considering only the school going children, out of 25,437 children 5,808 students (22.23%) were found to have eye problems. A considerable difference was

noted in the disease pattern between madaris students and state run schools. In former 34.3% students (1,375 out of 4,005) had eye problems whereas in later only 20.35% (4,433 out of 21,432) needed medical attention. This difference was mainly due to conjunctivitis and refractive error. In schools, 10% of the children suffered from conjunctivitis as compared to 17.0% of the students of madaris. The apparent cause was not the difference between hygienic environments but the fact that all the students in madaris were residents causing easy spread of the disease. The second important cause was refractive error with 2.14% of school students and 7.00% students from madaris having various refractive problems. Prevalence of refractive errors in school going children varies from 0.5% in Nepal¹² to 5.1% in India.¹³ The second National Blindness and Impairment survey of 2002-3¹⁴ had shown refractive error as 2.7% of the blindness in all ages.

The variation of various studies on childhood eye problems can be due to racial factors; but lack of standardization of the screening procedures cannot be over looked. The high prevalence of refractive error in children in madaris certainly needs some consideration. A similar study conducted by Zylbermann in Jewish religious students has also shown the increased prevalence of myopia. Abdullah and Abdullah¹⁵ examined 3,153 students, age 5 - 15 years studying in madaris of district Peshawar, to determine the prevalence of blindness and low vision. Refractive error was the main cause of low vision (VA between 6/18 and 3/60 in better eye) in this study. Out of 142 children (4.5%) with low vision, 130 (4.1%) children had uncorrected refractive error and 10 (0.4%) had causes such as: hereditary maculopathies, optic nerve atrophy, amblyopia and cataract. Our study found refractive error in 7% of children in madaris compared to only 2.1% of students enrolled in schools. Continuous accommodation has been proposed to play some role in the axial development of the eye resulting in myopia.¹⁶ The uncorrected refractive error may have a dramatic impact on the learning capacity of children and their education potential.¹⁷ Fortunately, refractive error is easily treatable, with the provision of a pair of spectacles, which is extremely cost-effective and provides immediate solution to the problem. The provision of affordable spectacles is another component of WHO's vision 2020 program.¹⁸ A cross sectional study by Deshpande and Malathi¹⁹ in 622 children of age 10 - 15 years, found prevalence of ocular morbidity at 27.65%. Refractive

error was the leading cause of ocular disorder (10.12%) followed by vitamin A deficiency (7%) and conjunctivitis (2.57%). The higher prevalence of conjunctivitis in our study at 11.10% can be due to seasonal variation and the short duration of the disease. In another study Alam and coworkers²⁰ examined 1000 children from 20 schools in Karachi and found 8.9% students with refractive error. This figure is higher than our study where we found overall 2.90% children with refractive error, 2.14% in schools and 7% in madaris. The prevalence of conjunctivitis was also found higher at 8% in a study carried out among students in south western Nigeria.²¹

Our study showed that 5,808 (22.8%) of the school going children had ocular problem. The important causes of impaired vision and possible blindness among them were refractive error (2.9%), VADD (3.29%), cataract (0.17%), nystagmus (0.1%), ptosis (0.1%), squint (0.46%), glaucoma (0.007%) and possibly vernal conjunctivitis (1.9%) in advanced stage involving cornea.

From the management point of view, the eye problems can be grouped under three categories: manageable at primary health care level, secondary level and tertiary referral center level.

The ocular problems such as conjunctivitis, blephritis, and VADD can be easily prevented by the health education of the community and can be treated by mid-level eye care providers. In this way, 69.5% (4,038) of the eye problems according to this study can be prevented or treated at primary level. Amongst these diseases, VADD is a potentially blinding disease and an important cause of nutritional blindness. Conjunctivitis though a harmless disease, can result in sight threatening corneal involvement. The refractive error was responsible for 2.90% (no = 740) of the ocular problem present in this study and can be managed by a refractionist. As there is a lack of this resource, the nearest place to refer the children would be to Tahseel headquarter (THQ) hospital. The training of this cadre can provide such service at the primary level making it more accessible and affordable. A well-trained refractionist can manage amblyopia, adding another 21.07% (no = 1224) to the cases to be managed at the primary level. According to this study 90.57% of the ocular problems of school going children can be managed at primary level provided by well-trained mid - level eye care personnel. The remaining 484 children (9.3%) having cataract, nystagmus, ptosis, squint, glaucoma and undiagnosed ocular problems needed referral to a

tertiary center for further management. Most of these congenital diseases cannot be prevented, but if diagnosed at the right time and treated, can save vision. Though, we only screened school going children between 6 - 15 years of age, there are surely children under 6 years of age, having various ocular problems. In this respect, government and various non-governmental organizations (NGOs) have to formulate a strategy to screen these children at pre-school level. Also 2487 students were found missing / absent from the schools, but even on repeated visits these students could not be found attending schools, making their enrollment in schools questionable.

CONCLUSION

Almost 23% of school going children in Labella district needed treatment for their ocular problems (34.33% children in madaris and 20.68% in schools). Though 90% were managed at the primary eye care level, 9.3% children needed referral to the tertiary care hospital with 3.87% of them having potentially blinding eye disease. The screening of school going children is important as early recognition and prompt treatment would reduce the ocular morbidity in that particular age group.

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