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IP International Journal of Ocular Oncology and Oculoplasty

Journal homepage: https://ijooo.org/

Original Research Article

Prevalence of myopia and its risk factors in school going children

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ARTICLE INFO

Article history:
Received 24-01-2022
Accepted 29-01-2022
Available online 09-05-2022

Keywords:
Myopia
Myopia
School going children
Refractive error

ABSTRACT

Aim: To identify the prevalence of myopia and its risk factor among the school going children.
Materials and Methods: Study sample included school going children between 5 and 16 years of age. We recorded degree of myopia by autorefractometer and streak retinoscopy after mydriasis, and students with refractive error of ≥-0.5 D for at least one eye were considered as myopic. Strict inclusion and exclusion criteria were followed.
Results: A total of 764 children were considered for the study. Prevalence of childhood myopia in hospital based study was 16.5 % with male to female ratio 53:47. Headache was most common complain for hospital visit. Most common age group affected was 7-12 and 13-16 years. In 18.53% of patients family history was present.
Conclusion: Due to high magnitude of uncorrected myopia, it appears to be a public health problem both in urban areas, which suggest that an increase in outdoor activity may help to reduce the magnitude of the problem.

1. Introduction

Myopia is one of the most common cause of visual loss in the world, and its incidence appears to be rising.[1] Genetic predisposition as well as environmental risk factors may influence the likelihood of acquiring myopia. Premature and low-birth-weight babies are more likely to get myopia in older stages of life, and a child's nutrition and height can also influence myopia development. There are considerable racial inconsistencies in the prevalence of myopia. On the basis of genetics, ethnicity and racial difference, prevalence of myopia can be explained. Close work an early age, as seen by a higher prevalence of myopia among the better education, educational levels of the parents and the individual, higher IQ, and socioeconomicity are all suspected environmental influences.

Myopia is thought to be caused due to increase in the axial (anterior-posterior) length of eye caused by close-up labour, according to several theories. According to studies, certain vocations that involve a lot of close-up work, such as microscopy, stitching, and carpet weaving, have higher prevalence of myopia. People with myopia, on the other hand, are more likely to favour occupations that require close labour, especially if their vision was not corrected in early years of life.

The rise in the number of myopic people in advancing age group can be related to the rise in near tasks like computer work, video games, and watching television. The disparity in myopia prevalence seen between the rural and urban populations in Indian studies also speaks to the same.[2]

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https://doi.org/10.18231/j.ijooo.2022.011

Myopia prevalence in the Indian population ranges from 2.77 percent to 7.4 percent.[3,4] According to a World Health Organization (WHO)-NPCB survey conducted in 1989, 1.49 percent of the Indian population is blind, with refractive defects accounting for 7.35 percent.[5] Even though the total prevalence of blindness was lowered to 1.1 percent, the proportion of blindness owing to refractive error grew to 19.7% in the NPCB-National Blindness Survey.[6,7]

Myopia is a major public health problem in India, particularly among the city population, due to any number of non-corrected refractive defects. The National Programme for the Control of Blindness has given it attention.

Unfortunately, despite the fact that this well designed, mainly federally funded school vision screening programme has been very victorious in many states, a large number of school age children remain non-identified, and not meeting need for refractive error correction in children appears to be important. Not corrected refractive errors cause learning difficulties and poor academic performance, ultimately affecting the child's psychosocial development. Detection and evaluation of youngsters, who are introverted and exhibit little interest in socialising and engagement, requires sensitivity and skill.[2]

2. Materials and Methods

This study was undertaken at Dr. Br Ambedkar Medical College and Hospital. 764 children up to 16 yrs. were screened for type and amount of ametropia with special emphasis on observing type and amount of myopia and its clinical presentation. It was a cross sectional hospital based study. Children upto 16 yrs. with refractive error were included in this study. Children > 16 yrs. children with history of eye trauma/ eye surgery were excluded from study.

Patients' names, ages, sex, address, and socioeconomic position were all recorded as part of their demographic profile. History of the patients were gathered, and main symptoms was listed in three categories in chronological order:

1. Ocular complaints: Tiredness/ pain in the eyes, recurring redness, and squint
2. Visual complaints: difficulties reading / vision problems at a distance or up close
3. Referred complaints include a headache, nausea or vomiting, and a history of nausea or vomiting.

Refractive error in siblings/parents, cerebral palsy/Down's syndrome, was also noted in the family. Personal history, as well as any noteworthy prenatal, perinatal, or postnatal history, were taken into consideration. Visual acuity was measured, and a thorough ocular examination was performed using a slit lamp examination and indirect ophthalmoscope to search for any problems.

Retinoscopy was done to determine type and extent of myopia, fundus examination were used to determine if there was any posterior segment involvement due to mydriasis. Atropine 1 percent eye ointment/homatropine 0.5 percent eye drops / tropicamide eye drops were utilised by the cycloplegic.

3. Results

Ametropia was reported to be present in 40.24 percent of children. Myopia was identified in 41.05 percent of the 307 ametropic children. The prevalence of childhood myopia was 16.5 percent in a hospital-based study. The male:female kid ratio was 53:47, and nearly $2/3^{rd}$ of population (63.61 percent) lived below the poverty line. Children from urban areas made up 59.18 percent of the total.Table 1

It is seen that ametropic children presented with different clinical features. Headache is the most commonly presented clinical feature, accounts for 82.19%.Table 2

As per the table more prevalence was observed in 7-12 and 13-16 years.Table 3

To moderate type of Myopia was more common than severe one.Table 4

Out of total eyes examined myopic astigmatism of < -2 D with the rule was observed in 78% males and 3 90% females.Table 5

Family history was present in 18.53% parents and 12.92% siblings in myopic patients.Table 6

Around 7.80 % of male and 8.29 % of female child were also having Anisometropia while Amblyopia was present in 0.88% of total eyes examined. Around 3.90% cases with myopia <-2 D, 2.11 % with-2D to -6D, and 0.32% with >-6D had exophoria. 0.08 % eyes with myopia <-2 D, 0.16% with -2 Dto -6 D and 0.08% with >-6 D had exotropia.

4. Discussion

Myopia, has been related to a variety of significant eye diseases, including myopic retinopathy, rhegmatogenous retinal detachment, myopic glaucomatous optic neuropathy, exudative myopic macular degeneration, haemorrhages and tears.

The purpose of the study was to find out how common myopia is in Indian schools and what variables contribute to it. In some Asian populations, myopia prevalence has been reported to be as high as 70-90 percent, with Taiwan reporting an 84 percent prevalence among 16-18 year old high school students.[8,9]

Myopia was found to be present in 4.79 percent of school pupils in Chandigarh in the first survey undertaken in India in the 1970s by Jain et al. In comparison to the rural population, it was higher in city population (6.9%). (2.77 percent).[10] Murthy et al.[11] investigated the prevalence of refractive error and accompanying visual disability in school-aged children aged 5 to 15 in a New

Table 1: Prevalence of Ametropia in children

S.No.	No. of pediatric patient	No. of ametropic children	No. of myopic patients
1	764	307	126

Table 2: Clinical features of ametropic children attending eye OPD (n=307)

S.No	Complaints	No. of cases	%
1	Going close to television	189	61.46
2	Not able to see black board	230	75.04
3	Frequent blinking/rubbing of eyes	24	7.96
4	Redness of eyes	24	7.96
5	watering	151	49.02
6	Recurrent swelling of lids	14	4.55
7	Eye ache	214	69.59
8	Head ache	253	82.19
9	difference in palpebral aperture	21	6.8
10	suint	6	1.86
11	Recurrent falling	1	0.1
12	Picked up in school	53	17.31

Table 3: Age and degree of myopia in children with myopia

Degree of myopia in dioptre	Age in years							
	0-3	%	4-6	%	7-12	%	13-16	%
<-2	-	-	8	1.21	54	8.94	55	8.86
-2 to -6	-	-	16	2.61	58	9.43	56	9.18
>-6	-	-	0	0	2	0.32	3	0.40
Total no of eyes	-	-	24	3.90	115	18.69	114	18.45

Table 4: Distribution of degree of myopia

Degree of myopia	No. of eyes	%
<-2 d	117	19.02%
-2 to -6d	131	21.21%
>-6d	5	0.8%
total	253	

Table 5: Myopic Astigmatism

Amount of myopic in diopter (d)	Astigmatism															
	With the rule				Against the rule				Oblique				Bi-oblique			
	No of eyes		%		No of eyes		%		No of eyes		%		N o of eyes		%	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
<-2	11	24	1.78	3.90	13	20	2.03	3.25	4	4	0.56	0.65	3	3	0.40	0.48
-2 to -6	14	15	2.35	2.52	12	10	1.95	1.54	3	4	0.56	0.65	1	2	0.16	0.24
>-6	1	1	0.08	0.08	1	1	0.16	0.24	-	1	-	0.08	-	-	-	-
total	26	40	4.22	6.50	26	31	4.14	5.44	7	9	1.13	1.38	4	5		0.73

Table 6: Family History of Refractive Error in Pediatric Ametropic Eyes (n=615)

Types of refractive error	Refractive error in parents	%	Refractive error in siblings	%
Myopia	57	18.53	40	12.92
Hypermyopia	24	7.80	28	9.10
Astigmatism	30	9.83	44	14.47
Total no of eyes	111	36.16	112	36.49

Delhi metropolitan community, finding a prevalence of 7.4% myopia.

The commonly reported risk factor of myopia is working near a computer, and various observations confirm this notion. In recent years, environmental variables like a more competitive school system have further added to the risk factor. Furthermore, environmental factors including as education, occupation, and personal income have been linked to the occurrence of myopia.

Because students in higher classes spend more time studying, a link between myopia with age and the rising prevalence of myopia with increased studying offers more support to the close work theory in myopia development. In this study, 18.53 percent of myopic cases had a parent with ametropia and 12.92 percent had a sibling with ametropia.[12,13]

5. Conclusion

For the prevention of myopia onset or progression, there is no well accepted or universally recommended treatment.

Myopia is regarded as a major public health problem in India, particularly in the city population, due to increased number of non corrected refractive defects. The National Programme for the Control of Blindness has given it top attention. The Government of India fully funds the school vision-screening programme, and impoverished students receive free spectacles. By 2020, the initiative aims to eliminate refractive error-related blindness by offering refractive error services at the primary level, with competent paramedical ophthalmic assistants available in vision centres for every 50,000 people.

Unfortunately, despite this fact that this well designed, federally funded school vision screening programme has been very victorious in many states, a large number of school-aged children remain not identified, and the non met need for refractive error correction in children appears to be more. Uncorrected refractive errors cause learning difficulties and poor academic performance, ultimately impacting the child's psychosocial development. The detection and evaluation of these youngsters, who are introverted and exhibit little interest in socialising and engagement, requires sensitivity and skill.

6. Conflict of Interest

The authors declare that there are no conflicts of interest in this paper.

7. Source of Funding

None.

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Cite this article: Sannidhi BJ, Rani Sujatha M A, Sinha DK, Karanvi S, Ranjitha KC, Bokhari SS. Prevalence of myopia and its risk factors in school going children. *IP Int J Ocul Oncol Oculoplasty* 2022;8(1):52-55.