A Study on the Prevalence of Myopia Among High School Students in Urban Field Practice Area of Osmania Medical College, Hyderabad, Telangana

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ABSTRACT

Introduction: Myopia, or nearsightedness, is a form of visual impairment in which distant objects appear due to excessive axial eye growth that is mismatched to the eye's refractive power. Myopia is a common vision condition affecting nearly 30% of population. It occurs more frequently among school children aged between 8 and 12 years Uncorrected refractive errors are responsible for about 19.7% of blindness. Objectives: This study is aimed at finding the prevalence of myopia among the high school students aged 12-16 years of a school in the urban area of Telangana and the influence of environmental factors, indoor activities like reading, computer games and outdoor activities.
Material and Methods: A cross-sectional study of government schools in the urban field practice area of Osmania Medical College was made.
Results: The study population comprised of 600 students out of which 54.5% were boys and 45.5% were girls. 140 (23.3%) children were confirmed to have refractive error. It was found that there was a female preponderance among students.
Conclusion: More incidence in girls. More hours of outdoor activity prevented myopia.

Keywords: Myopia, outdoor activity, computer.

INTRODUCTION

Myopia, or nearsightedness, is a form of visual impairment in which distant objects appear due to excessive axial eye growth that is mismatched to the eye's refractive power. Rising myopia prevalence rates are due to advanced technology and increased indoor activity, decreased outdoor activity and decreased illumination. The duration and degree of another myopia risk factor, near work, are typically estimated retrospectively through questionnaires that assess reading and computer use. But strictly speaking there is no comprehensive method of measuring working or fixation distance during natural tasks Close reading at a distance <30 cm and continuous reading for >30 minutes and in decreased illumination increases the progression of myopia. The risk of development of myopia further increases with the habit of reading in supine position. Because the eye continues to grow during childhood, it typically progress until about age 20. However, myopia may also develop in adults in conditions of visual stress and diabetes.

Myopia rates are increasing worldwide, particularly in East Asian countries. In data reviewed by Morgan and Rose (2005), higher prevalence rates are seen in urban areas. For example, the prevalence of myopia in Japan grew from 39% in 1984 to 59% in 1996. Increases in Taiwan (36.7% in1983 to 60.7% in 2000) and Hong Kong (83% in 2001, from53% in 1991) have also been reported. These data show myopia in 12 and 13-year-old children. By contrast, similar studies in likewise aged children in India and South Africa show lower rates of myopia (4.8-10% and 4%, respectively).[1] The prevalence of myopia has been reported as high as 70-90% in some Asian countries. In East Asia the prevalence of myopia has been reported to be very high particularly in Japan, South Korea, Singapore, Taiwan, Hong Kong, and China though in India rates are much lower. Myopia is a common vision condition affecting nearly 30% of population. It occur more frequently among school children aged between 8 and 12 years Uncorrected refractive errors are responsible for about 19.7% of blindness. About 13% of Indian population is in the age group of 7-15years. And about 20% of children develop refractive error by the age of 16 years and this has been reported from South Asia and India. In Telangana, not many studies on prevalence of myopia have been done. Thus this study was undertaken to find out the prevalence of myopia in high school children and its causes. This study was aimed at finding the prevalence of myopia among the high school students aged 12-16 years of a school in the urban area of Telangana and the influence of environmental factors, indoor activities like reading, computer games and outdoor activities. Also to know the influence of genetic factors and unhealthy reading habits like reading in supine position, reading in low illumination at a near distance and playing mobile games for long duration helps in development of myopia.

MATERIAL AND METHODS

Study Design: A cross-sectional study of government schools in the urban field practice area of Osmania Medical College was made. There were 10 schools. Permission was taken from the school authorities for the study. An informed consent sheet explaining the study aims and objectives, the detailed procedure that would be carried out along with a form to sign for providing the informed consent for given to the students. The forms were in English and the local vernacular language which is Telugu. This included permission to take vision, examine the eye, ask questionnaire about demographic details. All examinations were carried out in the presence of an appointed representative of the school principal. Ethical clearance was taken from the

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Institutional Ethical Committee prior to the study.

Inclusion criteria: All students present on the day of data collection, were equal to or more than 12 years, and who gave informed consent were included in the study.

Exclusion criteria: Students less than 12 years and who were absent on the day of data collection were excluded from the study.

Sampling: 4pq/lxl= 4x15x85/3x3 = 567.

The sample size was rounded off to 600. The distant vision of a child was tested utilizing Snellen's chart. The visual acuity was tested with the chart at 6 meters. If uncorrected vision was <6/12 in either eye, the child was declared to have defective vision. Students were interviewed by using self-administered questionnaire. Students were placed 6 m from Snellen's chart and asked to read the chart. Each eye was tested separately. From the findings of this, students were grouped as myopic and nonmyopic. Students who were not having 6/6 vision for at least one eye were considered as myopic. The questionnaire was filled by asking the details from the child and was aimed to determine the genetic and environmental factors affecting the development of myopia in these children. The details regarding the time spent on reading and outdoor activities was asked individually for every day of the week. The distance from the television screen while watching television was also asked. The illumination of the room and their posture during the reading time was asked. considered statistically significant. Anthropometric measurements were done for all the children. Weight and height of all children was taken. All those children unable to read the 6/9.5 letters or those previously wearing spectacles were referred to an ophthalmologist for detailed examination. Refraction was done in 2 stages, first under cycloplegia using eye drops 2% homatropine which was instilled in the inferior conjunctival cul-de-sac twice at an interval of ten minutes and correlated accordingly. All children who were unable to read even after refraction were prescribed spectacles.

STATISTICAL ANALYSIS

The data was entered in MS Excel 2007 and analyzed in Epi Info Version 7. Analysis of categorical variables was done using Chi-square test. Criteria of significance used in the study were $P < 0.05$.

RESULTS

The study population comprised of 600 students out of which 54.5% were boys and 45.5% were girls. 64.5% of students were 12-14 years and the rest were above 14 years. All the children were screened for defective vision with the help of Snellen's chart and 160(26.6%) children had difficulty in reading the chart from a stance of 6 m. After the ophthalmologist examination, 140(23.3%) children were confirmed to have refractive error. It was found that there was a female preponderance among students. Girls had a higher percentage (14%) than boys.

The family history was also taken into consideration and p value (0.0504) was found to be insignificant. Nevertheless in some studies, family study is considered significant. The distance of the television from the person was found to have an effect on the development of myopia. It was found that due to crowded living

|	Myopic	Non myopic	Total
TV Distance <30 cm	94	358	452
TV Distance>30 cm	46	102	148
Total	140	460	600
(P value-0.0102 significant.)			

Table-1: Table showing the effect of the distance of tv screens from the eye with relation to myopia.

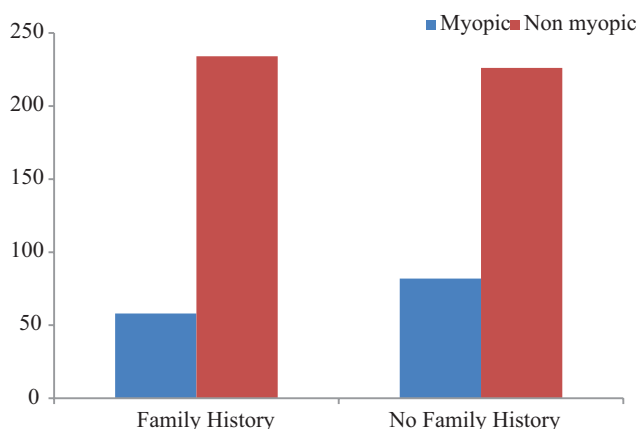|	Myopic	Non myopic	Total
>6 hrs/week playing outdoors	30	300	330
<6 hrs/week playing outdoors	90	180	270
TOTAL	120	480	600
P value (<.0001) significant.			

Table-2 Table showing number of hours of play outside per week with myopia development.
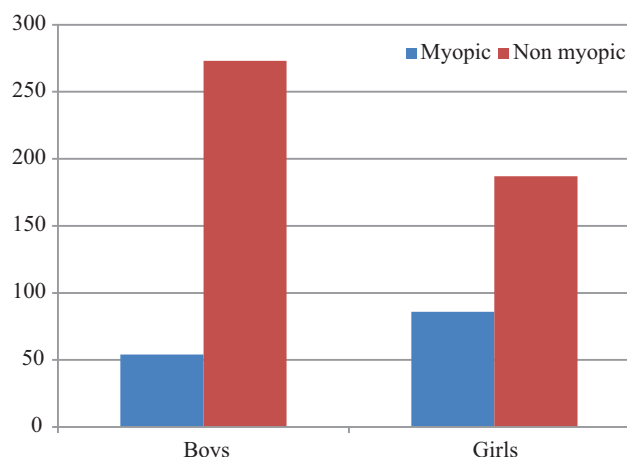
P value(0.0001) significant
Figure-1: A graph showing the incidence of myopia in boys and girls.

P value (0.0504)

Figure-2: A Graph showing the impact of family history on myopia.

conditions, the distance of the television could not be more.

<30 cm distance from the television was found to increase myopia (p value 0.0102). It was significant. Other factors such as poor illumination and less rest to eyes in between television watching also contributed.

It was found that playing outdoors or at least staying outdoors helped to decrease the incidence of myopia. >6 hours of outdoor life was helpful in preventing myopia.<6 hours caused an increase in myopia. p value(< 0.0001) was significant.

DISCUSSION

In India, as in other developing countries, the school health services provided are hardly more than a token service because of shortage of resources and insufficient facilities. This study was done to find out the prevalence of myopia among high school students. The prevalence of myopia was found to be 23.3%. It was found in a similar study by V.Krishna Kumari et al that the prevalence was 25.8%.[1] In a study by Rohit Saxena et al the prevalence was 24.7%.[2] The mean age of children affected was 13.4 years. In this study there was preponderance among female students(55.6%). This was similar to other studies.[3] A large percentage of children with mild refractive errors are apparently not wearing spectacles, and this may lead to increasing myopic power as time progresses, the school eye screening programme should be strengthened and good improved coverage should be encouraged. The government should provide subsidized spectacles. As stated above, girls have higher percentage of myopia (55.6%) as girls spent greater number of hours in reading and writing at home compared to boys They spend most of their time indoors. It was observed in my study that that 16% of the students who spent more time indoors had myopia compared to the 3.5% of the myopics who spent more time outdoors. This is significant. This is similar to study by Rohit Saxena etal.[2] Therefore girls constitute a high risk group and special efforts should be made to examine girls, counsel them and encourage them to play outdoors.[4] The distance from tv screens also contributed towards development of myopia. This is similar to the study by K.Rajendran etal.[3] In my study this factor was significant.

We found that myopia was more prevalent in children with positive family history of myopia. We can say that myopia in school children in India is an important health issue associated with many lifestyle related modifiable risk factors. An increase in outdoor activity may help to decrease myopia incidence according to studies by Amanda.[5] Similar results were found by Morgan et al[6] and Pan CW.[7] Some students get headache from spending excessive time in front of TV or computer. To avoid some of these problems, it is advisable not to watch TV in a dark room, to sit a little further from the TV, to angle the computer screen straight ahead. Playing mobile games for long time induces great stress on the eye as mobile screen is very small. Many of the parents are not aware of these side effects that mobile phones can make, so let their children to play with these for a longer period of time. Unhealthy reading habits and low illumination for long time have an influence in the development of myopia. This was proved by our study. Most of the children with uncorrected refractive errors are asymptomatic and hence community screening helps in early detection of refractive errors and their further progression.[8]

CONCLUSION

The study on prevalence of myopia among adolescent school students was done among 600 students. Out of 160 students detected by the investigator, 140 students were confirmed by the ophthalmologist. There was more incidence of myopia in females. But family history was found insignificant. Risk of myopia is increased particularly in those children who have a reading habit, increased indoor activities and family history. More hours of outdoor life and increased distance from TV screens prevented myopia. Myopia is more common in children who are constantly engaged in indoor activities like watching TV, computer, mobile and videogames. Use of antiglare screens may prevent development of myopia. Most of the children with uncorrected refractive errors are asymptomatic and hence screening helps in early detection of refractive errors and their further progression.

RECOMMENDATIONS

School health services should be improved. Spectacles should be provided at subsidized rates and myopia should be detected at an early age. Outdoor activities should be encouraged and television watching and video games should be curbed at primary school level itself.

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International Journal of Contemporary Medical Research
ISSN (Online): 2393-915X; (Print): 2454-7379 | ICV: 50.43 | Volume 3 | Issue 6 | June 2016

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