

Original Research Article

<http://dx.doi.org/10.20546/ijcmas.2016.507.080>

Analysis on the Pervasiveness and Essential Aspects of Myopia

M. Anitha*, D.M. Monisha, M. Nivethitha, A. Mohamed Sulthan,
S.A. Annapoorani and J. Hemapriya

Department of Microbiology, Shri Sathya Sai Medical College & Research Institute,
Thiruporur, Sri Balaji Vidyapeeth University, Tamil Nadu, India

*Corresponding author

ABSTRACT

The present study designed to investigate the prevalence of myopia and also to evaluate the related complications in Medical students of SSSMC&RI, Ammapettai. The present study was carried on 150 MBBS students of SSSMC & RI. The increasing trend of myopia has been observed among Medicos through self administered questionnaire form and Diopters were obtained based on American optometric association guidelines. This study proved that the occurrence of myopia was due to familial, environmental and unhealthy dietary patterns among Medical students. Out of 150 students, 136 students showed positive results for familial history, 92 students for environmental history, where as 57 students presented with past ocular problem, from which 45 students were under medications. The prevalence rate of myopia was higher in female students when compared with the male students. High incidence and progression of myopia was highly associated with environmental factors such as computers, video games, television, mobile phones and also the parenteral factors. To overcome this problem, regular physical activity and eye exercises are mandatory for the Medicos which will help to control their refractive error, which may avoid the complications

Keywords

Myopia,
Medical
Students,
Complications.

Article Info

Accepted:
22 June 2016
Available Online:
10 July 2016

Introduction

Myopia is the most prevalent ocular disorder throughout the world. Myopia (nearsightedness or short-sightedness) is one of the three commonly detected refractive errors, the other two being hypermetropia (long-sightedness) and astigmatism. Myopia is a state of refraction in which eyes fail to see distant objects properly (Churg *et al.*, 2006).

Refractory state is that the optical system of the non accommodating eye fails to bring parallel rays of light in to the focus of retina. High incidence & progression rates of

myopia have been reported in individuals who spend long hours in near work activity, such as carpet weavers, visual display terminal workers & microscope users. Myopia is a common cause of visual impairment in developing countries.

Both environmental and genetic factors are believed to be associated with the onset and progression of myopia. Environmental factor is mainly near work, includes activities of reading, writing, mobile phones usage, computer work, and close television watching. There is an increased pressure in

the posterior part of the eye during accommodation which is when poorly resisted by the sclera, results in increased ocular length. "Myopia is a global public health problem in young academically active populations leading to visual impairment and complications like blindness (Saw *et al.*, 2005).

The prevalence and severity of myopia is due to upward trend of standard of living and educational methods. Myopia is not a trifling problem throughout the world, not only among adults but also in children, teenagers and young adults. Of the factors contributing to myopia, environmental and familial factors are seem to be more important. Each of these is being considered as an independent factor for myopia (Von Noorden *et al.*, 1987).

High myopia or pathological myopia is associated with globe elongation and a refractive error of at least 6 diopters (D) and/or axial length of greater than 25.5 mm. The prevalence of high myopia varies considerably in different ethnic groups and has been estimated to be around 10% in Asian populations (Sperduto *et al.*, 1983).

Excessive axial elongation of the globe in high myopia can cause mechanical stretching and thinning of the choroid and retinal pigment epithelium layers, resulting in various retinal degenerative changes. It is well known that individuals with high myopia have increased risk of retinal complications such as peripheral retinal degenerations, retinal tears, retinal detachment, posterior staphyloma, chorioretinal atrophy, retinal pigment epithelial atrophy, lacquer cracks, choroidal neovascularisation (CNV) and macular haemorrhage (Pierro *et al.*, 1992).

The correction of refractive error by VISION 2020. The 'Right to Sight', the joint global initiative of the World Health

Organization (WHO) and the International Agency has introduced the awareness for the 'Prevention of Blindness' (World Health Organization, 1997).

With curiosity, we made an effort to find out the awareness and pervasiveness of myopia among the medical students.

Methodology

The present systematic cross-sectional study reported the prevalence of refractive errors among male and female Medicos of SSSMC & RI, Ammapettai. The present study was carried on 150 MBBS students (out of which, 70 males and 80 females).

Informed oral consent was obtained from each student after the nature of the study was explained to them individually. Students were asked to fill up a questionnaire regarding their different habits like history of computer usage, Television watching, Mobile phone usage and playing video games. The family histories relating to refractive errors in their parents were also collected individually according to American optometric association guidelines (Goldschmidt, 1968). The frequency of myopia in Medical students were assessed by obtaining diopters from an individual.

Inclusion Criteria

- family history of myopia,
- unhealthy diet,
- environmental factors

Exclusion Criteria

If the student was suffering from any,

- psychiatric illness
- under any anti-depressant medication
- if a student refused to grant consent,
- students with ocular disease (retinopathy, genetic disease, connective tissue disorders)

associated with refractive error) were excluded from the study

Results and Discussion

In this study 150 MBBS students were selected, out of these, 136 students showed positive results for familial history, 92 students showed positive results for environmental history, where as 57 students presented with past ocular problem, from which 45 students were taking medications.

According to males, the positive results for familial history was 64 (47%), for unhealthy diet 40 (48%), for environmental history 40 (43%), 35 (61%) presented with past ocular problems, 28 (62%) were under medications as shown in table 1 and figure 1.

But in females, 72 (53%) showed positive result for familial history, 52 (57%) for environmental history, 44 (52%) for unhealthy diet, 22 (39%) presented with past ocular problems and 17 (58%) were taking medications as shown in table 1 and figure 2.

In our result, both genders are lacking physical exercise due to laziness and loss of interest in outdoor activities. To overcome this problem, regular physical activity and eye exercises are mandatory for the Medicos.

These factors will enhance the complications of myopia especially in Medical students. This study reveals that the complications of males were highly due to unhealthy diet (48%), followed by familial factors (47%) and environmental factors (43%), whereas the complications in female students are because of environmental factors (57%), family history(53%) and unhealthy diet (52%).

In this study the prevalence of myopia among male medicos are predominantly due

to unhealthy dietary factors and in female Medicos, environmental factors are found to be more common.

The ranging of myopic students based on the number of diopters as shown in table:2, figure3. Predominantly the diopter ranging from 0.5 to 1.5 (38%), from 1.75 to 3.00 (24%), from 3.25 to 4.5 (17%) and more than 5.00 were 21%.

In this study observation has done regarding the prevalence of myopia among male and female Medicos of SSSMC & RI, out of 150 myopic students, 70 students (47%) were found to be males, 80 students (53%) were females. of myopia in both the genders was more commonly associated with parental history and environmental factors in both the genders.

In India, there are limited data available on the prevalence of refractive errors in the adult population. It is estimated that 49.3 million of those aged ≥ 15 years may have refractive errors and under corrected refractive error is the most common cause of reversible blindness in India.

Goldschmidt (Dandona *et al.*, 1999; Goldschmidt, 1968), reported that the prevalence rate of myopia was higher in female students as compared to the male students.

The study of Sidra Fatima Naqvi (2016) indicated that the prevalence rate of myopia was higher in female students (70.4%) than in male students (29.6%). Similarly in our study female Medicos (53%) are highly myopic than males (47%).

In these findings, out of 150 students, 136 students showed positive result for familial history, in which 64 (47%) were males, 72 (53%) were females and this report is correlating with Razia Chaudhry *et al.*, in their reports 71 (60.7%) was positive for

family history from 117 myopic students (Razia Chaudhry *et al.*, 2011).

Similar to other reports, majority of the parents of myopic Medical students are also found to be myopic. Thus genetic factor may play a more substantial role in the

development of myopia (Wong *et al.*, 1993; Suneetha *et al.*, 2012). Myopia is thought to be multi factorial with environmental and genetic factors as well as their connections being involved (Morgan *et al.*, 2006). The present study supported such observation.

Table.1

S.No	History	No. of Myopic in Males	No. of Myopic in Females
1	Familial history	64 (47%)	72 (53%)
2	Unhealthy diet	40 (48%)	44 (52%)
3	Environmental history	40 (43%)	52 (57%)
4	Past ocular problems	35 (61%)	22 (39%)
5	Medications	28 (62%)	17 (58%)
6	Physical exercise	-	-

Table.2 Frequency of Myopic Students According to number of Diopters

Range of Diopters	Frequency	Percentage
0.5 – 1.5	57	38%
1.75 – 3.00	36	24%
3.25 -4.5	26	17%
>5.00	31	21%

Fig.1 Prevalence of Myopia in Male Medicos

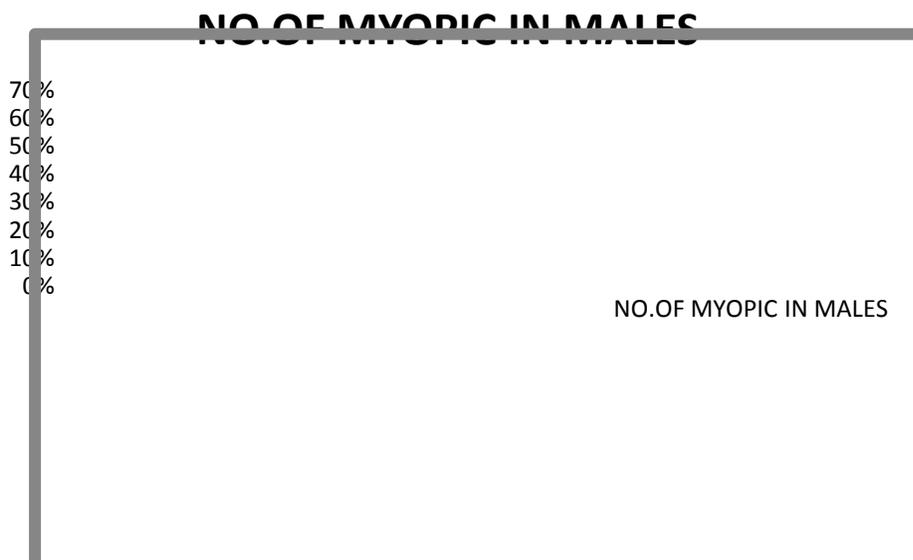


Fig.2 Prevalence of Myopia in Female Medicos:

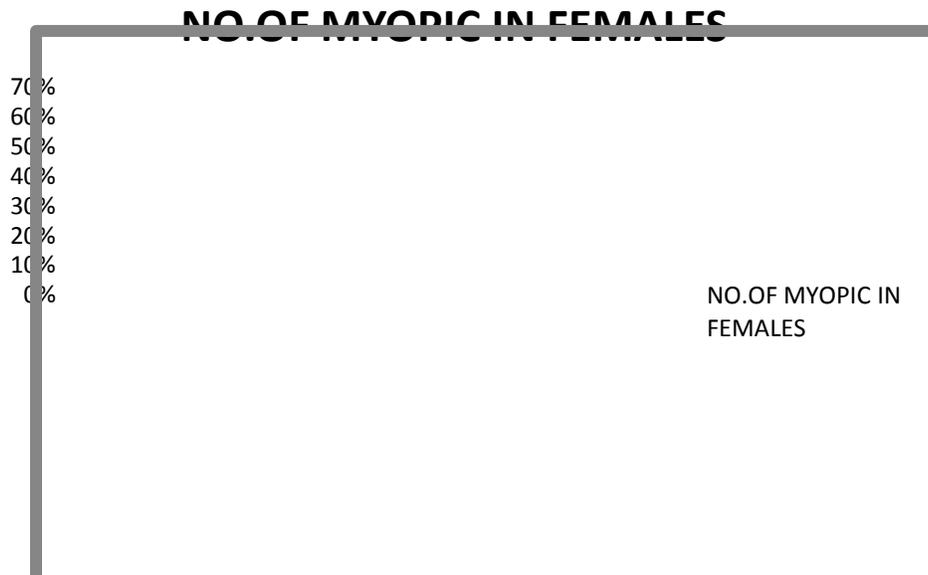


Fig.3 Frequency of myopic students according to no. of diopters



In other studies dietary factors have also been suggested as possible risk factors for myopia.

Like wise, in our investigation, myopia of unhealthy diet might be due to low levels of calcium, fluoride and selenium which are associated with increased risk of progressive myopia. Therefore intake of Vitamin A

foods such as carrots, water melons, banana, apples and spinach might reduce the risk of myopia.

Similar to Rawstron *et al.*, 2005 findings, our results also suggesting eye exercises and physical exercises for prevention of refractive errors. Students should encourage themselves to actively participate in training

and education to improve attitudes toward myopia, to increase protective factors, and decrease the risk factors for myopia complications.

In conclusion, we conclude, Myopia is a predominant refractive error among the Medical students. Higher level of outdoor activities will decrease the development of myopia by providing sunlight exposure which gives stronger sclera that is less prone to stretching associated with axial elongation in myopia. Hence regular physical activity and eye exercises are compulsory for the Medicos which will control their refractive error and may avoid the complications of myopia.

Myopic students should be aware of complications by following the preventive measures. Eye care needs for the public through clinical care, research, and education, all of which enhance the quality of life.

Acknowledgement

Authors wish to thank Management of SSSMC & RI and Medicos for the support extended to complete this work.

References

Churg, K.M., Mohidin, N. 2006. Prevalence of visual disorders in Chinese. *Optom. Vis. Sci.*, 73: 695-700.

Dandona, L., Dandona, R., Naduvilath, T.J. 1999. Refractive errors in an urban population in Southern India. The Andhra Pradesh Eye Disease Study, *Invest Ophthalmol. Vis. Sci.*, 40: 2810-2818.

Goldschmidt, E. 1968. On the etiology of myopia, An epidemiological study, Munksgaard, Copenhagen (thesis).

John, F., Amos, O.D., M.S., Kerry, L. Beebe, O.D., *et al.* 1997. Optometric

clinical practice guidelines care of the patient with myopia, approved by AOA board of trustees August 09.

Wong, L., D. Coggon, M. Cruddas, C.H. Hwang. 1993. Education, reading, and familial tendency as risk factors for myopia in Hong Kong fisherman. *J. Epidemiology. Comm. Hea.*, 47: 50-53.

Morgan, A., Young, R., Narankhand, B., Chen, S., Cot-triall, C. *et al.* 2006. Prevalence rate of myopia in schoolchildren in rural Mongolia. *Optometry and Vision Sci.*, 83: 53-56.

Pierro, L., Camesasca, F.I., Mischi, M., Brancato, R. 1992. Peripheral retinal changes and axial myopia. *Retina*, 12: 12-7.

Rawstron, J.A., Burley, C.D. and Elder, M.J., A systematic review of the applicability and efficacy of eye exercises. *J. Pediatric Ophthalmol. Strabismus*, 42: 82-88.

Razia Chaudhry, Hassan Ali And Naheed H. Sheikh 2011. Frequency and underlying factors of myopia among Medical Students. Vol.27, Bio-14.Doc P. 154 – 160 (KC).

Saw, S.M., Gazzard, G., Shih, Yen, E.C. and Chua, W.H. 2005. Myopia and associated pathological complications. *Ophthalmic Physiol. Optics*, 25: 381-391.

Sidra Fatima Naqvi, Sana Hanif, Inamul Haq, Muhammad Naeem, Myopia in Medical Students and its Association with Parental History. *Journal of Rawalpindi Medical College Students Supplement*; 20(S-1):13.

Sperduto, R.D., Seigel, D., Roberts, J., Rowland, M. 1983. Prevalence of myopia in the United States. *Arch. Ophthalmol.*, 101: 405-7.

Suneetha Chalasani, Vasantha Kumar Jampala and Prasunpriya Nayak. 2012. Myopia among Medical students-A

- Cross Sectional Study in A South Indian Medical College. *Al Ame en J. Med. Sci.*, 5(3): 233-242.
- Von Noorden, G.K., R.A. Lewis. 1987. Ocular axial length in unilateral congenital cataracts and blepharoptosis, *Investigative Ophthalmol. Visual Sci.*, 28: 750-52.
- World Health Organization, WHO. 1997. Programme for the Prevention of Blindness and Deafness Global Initiative for the Elimination of Avoidable Blindness, Geneva, 1.

How to cite this article:

Anitha, M., D.M. Monisha, M. Nivethitha, A. Mohamed Sulthan, S.A. Annapoorani and Hemapriya, J. 2016. Analysis on the Pervasiveness and Essential Aspects of Myopia. *Int.J.Curr.Microbiol.App.Sci.* 5(7): 701-707. doi: <http://dx.doi.org/10.20546/ijcmas.2016.507.080>