



Original Article

PREVALENCE OF MYOPIA AND ITS ASSOCIATED RISK FACTORS IN LOCAL MEDICAL STUDENTS

* Naila Parveen, ** Syed Hafeezul Hassan *** Javeria Rehman, **** Usman Shoukat

* MBBS, MPhil, Assistant Professor, Department of Physiology, Liaquat National Medical College, Stadium Road, Karachi-74800, Pakistan. ** MBBS, DTCT, MCPS, MPhil, PhD., Professor and Head of Dept. of Physiology, *** MBBS. Lecturer, Department of Physiology, **** Medical Student (3rd Year MBBS), Liaquat National Medical College, Stadium Road, Karachi-74800, Pakistan.

ABSTRACT

Received on : 11-10-2015

Accepted on : 15-12-2015

Objective: To study the prevalence of myopia and associated risk factors in local medical students.

Methods: This is a cross-sectional study conducted at Liaquat National Medical College, Karachi during January 2015 to August 2015. A total of 500 medical students of either sex were enrolled in the study after approval from the ethical review board. 347 females and 110 males participated in the research project. Eye testing for all the participants was determined by the Snellen's chart following the standard procedure and diopter measurement was done by referring the myopics to the ophthalmology department. Information about the underlying risk factors associated with myopia was gathered through a questionnaire by the interviewer.

Results: The prevalence of myopia was 47%. A total of 73.4% of females and 26.5% of males were myopic. Majority of myopic students (43.7%) had lens power between -0.5 to -1.75D. High myopia was found in 18.1% with lens power $> -5.00D$. First year students had the greatest percentage of myopia with 48%. Out of 215 medical students with myopia, 172 (80%) gave positive family history of myopia, whereas 43 (19.1%) had none. Time spent on electronic gadgets was highest, 64.2% of the students for greater than one hour. 50.2% had an increase in study duration and 56.3% complained of worsening of their myopia with the medical studies. The maximum reading distance in myopic and non-myopic was < 15 cm and 15-30 cm respectively. Time spent on the personal computers was > 1 hour by 32.2% of the myopic.

Conclusions: High prevalence of myopia was found among the medical students and the major risk factor that contributed greatly to this was the use of the electronic gadgets apart from family history.

Key Words: Myopia, Medical students, Prevalence.

Correspondence address:

DR. NAILA PARVEEN,
MBBS, MPhil.

Assistant Professor,
Department of Physiology,
Liaquat National Medical
College, Stadium Road,
Karachi-74800, Pakistan.

Cell: 0334-3887822,

E-mail: m_naila72@yahoo.com

INTRODUCTION

Myopia, also called near-sightedness or short sightedness, is a refractive error

PREVALENCE OF MYOPIA AND ITS ASSOCIATED RISK FACTORS

in which eye fails to see distant objects clearly. Prevalence of myopia has been reported to be increasing worldwide especially in different parts of Asia.¹Increase in myopia frequency poses a threat to the health and is an avoidable burden on the economy of the developing countries. There is sufficient evidence in the ophthalmic literature to support the common view of association of myopia with the scholarly people or having higher level of education. However, there are also suggestions in regard to the role of environmental, nutritional, hereditary and work associations for this dramatic increase in myopia.¹Prevalence rates in Asian countries vary from 50% in Chinese children to 84% in Taiwan and Hong Kong.²In Singapore, the prevalence of myopia is one of the highest worldwide, affecting 28% of school children at the beginning of their primary education and 70% of those completing university education.³According to the national blindness and visual impairment survey, crude prevalence in adult Pakistani population was 36.5%.⁴Well-known among the myopia risk factors is a role for near work, such as reading and related visual tasks. More higher education is repeatedly associated with greater myopia prevalence.^{5,6}

For any developing country, medical students are considered as an academically dynamic population and a powerful future for the human resource. But with the increasing incidence of refractive errors in these individuals, they could add to the economic burden. Therefore, awareness about the risk factors leading to myopia would be of support in its prevention and planning of public health strategy.⁷ Moreover, in the recent years, with the increased application of the electronic gadgets especially the smart phones can be a major risk for the rising incidence of myopia. Public awareness programmes about the pros and cons of these electronic devices should be held on regular basis and put to priority by the health

authorities.

The aim of this research project was to determine the prevalence of myopia among all the five years of medical students at Liaquat National Medical College, Karachi and to study the risk factors associated with it.

METHODS

This cross-sectional study based on a questionnaire was conducted at Liaquat National Medical College after approval from the concerned ethical review board. After taking consent, a total of 457 medical students both genders out of which 347 females and 110 males were enrolled in the study from all five year M.B.B.S classes. Cluster sampling technique was used to select the candidates in which total sample was divided into 10 groups comprising of 50 medical students in each group. Visual acuity was tested using Snellen's chart following the standard procedure in the Physiology lab. Students with visual acuity less than 6/6 were sent to the LNMC eye OPD for further evaluation by computerized eye testing. They were asked to bring the myopia results and to assess the under lying risk factors, a questionnaire (Table-IV) was filled by the interviewer.

After data entry, statistical analysis was done on SPSS 18 to study the prevalence and compare the frequency of myopia among all medical students of five years along with lifestyle and hereditary factors affecting it.

RESULTS

Out of the total 457 students participating in the study, 215 were found to have myopia and 242 candidates had no myopia. The prevalence of myopia was 47%. According to lens power, > -5.00 D was found in 18.1%, -3.0 to - 3.5

TABLE-I:
Gender distribution of study subjects.

| Gender | Frequency N | Myopic | Non-myopic |
|--------|-------------|--------|------------|
| Male | 110 | 57 | 53 |
| Female | 347 | 158 | 189 |
| Total | 457 | 215 | 242 |

TABLE-II:
Percentage of myopic students according to Lens Power.

| Lens Power (Diopters) | Myopia Frequency (N=215) | Myopia Percent |
|-----------------------|--------------------------|----------------|
| > - 5.00 | 39 | 18.1% |
| -3.0 to -3.5 | 35 | 16.2% |
| -2.0 to -2.75 | 44 | 20.4% |
| -0.5 to -1.75 | 94 | 43.7% |

PREVALENCE OF MYOPIA AND ITS ASSOCIATED RISK FACTORS

TABLE-III:
Frequency and risk factors associated with myopic and non-myopic.

| Variables | Myopic | Non-myopic |
|-------------------------------------|--------|------------|
| Frequency | 47% | 53% |
| Time on electronic gadgets > 1 hour | 64.2% | 59.9% |
| Time on computers >1 hour | 32.2% | 42.4% |
| Reading-distance <15cm | 60.9% | 4.5% |
| Increase in Study duration | 50.2% | 40.1% |
| Change in myopia-worsened | 56.3% | — |
| Family history of myopia | 76.9% | — |

TABLE-IV:
Questionnaire format.

| |
|---|
| Demographic data was obtained which included age, gender, year of study |
| Power of lens in diopters with diagnosis of myopia |
| History of myopia in either/both parent(s) |
| Average time spent on studying or reading literature,books,magazines |
| Average time spent on electronic gadgets |
| Average time spent on computers/ laptops |
| Average reading distance for reading printed materials |
| Change in average duration of studying in past 1 year |
| Change in myopic condition in the past 1 year |

D in 16.2%, -2.00 to -2.75D in 20.4% and -0.5 to -1.75 D in 43.7%. A total of 73.4% of females and 26.5% of males were myopic. First year students had the greatest percentage of myopia with 48%. Out of 215 medical students with myopia, 172 (80%) gave positive family history of myopia, whereas 43 (19.1%) had none. Time spent on electronic gadgets was highest, 64.2% of the students for greater than one hour. 50.2% had an increase in study duration and 56.3% complained of worsening of their myopia with the medical studies.

The maximum reading distance was < 15 cm in myopic and in non-myopic, it was 15-30 cm. Time spent on the personal computers was >1 hour by 32.2% of the myopic which showed significant difference with the time spent on the electronic gadgets or the smart phones.

DISCUSSION

According to the report by World Health Organization, uncorrected refractive error is the second commonest cause of global visual impairment next only to cataract.⁸In this study, high prevalence of myopia was found among the medical student which was in agreement with the study conducted by Sood et al.⁹Similar to our findings, Chalasani et al. also observed that the number of myopic was found

to be increased among the student taking admission in the medical college every year.¹

First year medical students, in the present study showed the highest percentage of myopia which was consistent with the findings of Chaudary et al. who reported increased frequency in 1st and 2nd year students.²

Our study showed that high myopia was found in 17.3% with lens power > -5.00D. These results were close to the study conducted in Singapore by Woo et al which reported 28.7% of high myopia with lens power >-6.00D.³

Majority of the mopic(43.7%) in this study showed lens power between -0.5 to -1.75 D. This was in agreement with Chalsani et al who found that increased percentage of myopics had lens power < 2.00D.¹

Worsening of myopia with the medical studies and increase in study duration was present in 56.3% and 50.2% respectively. This was confirmed by Dey et al. who found that long and rigorous study schedule of average 5 to 6 years predisposed the medical students for higher rate of refractive errors especially myopia.¹⁰

PREVALENCE OF MYOPIA AND ITS ASSOCIATED RISK FACTORS

Chaudary et al. and Goldschmidt et al. demonstrated a strong genetic predisposition to myopia and the genetic effect was significantly larger in subjects with a higher level of education.^{2,11} In a way, their study compliments ours, where 80% of myopic students gave positive family history of myopia. High relationship was found between female sex and refractive error in our study which is consistent with the findings by A Haseeb et al. and S Gopalakrishnan.^{7,12}

It was observed in our study that myopia is also highly associated with use of electronic gadgets such as smart phones and computers. This observation was in agreement with the findings of Reddy et al. who found that more than 2 hours continuous use of computer was significantly associated with occurrence of symptoms of computer vision syndrome.¹³ Our results in this regard is also consistent with another study suggesting that prolonged use of computers is responsible for visual fatigue which in turn may lead to myopia.¹⁴

According to David Allamby, Founder of Focus Clinics, there has been a 35 per cent increase in the number of people with advancing myopia (short sightedness) since the launch of smartphones in 1997.¹⁵ Our study proposed the higher incidence of myopia among smart phone users as also suggested by Lee H et al.¹⁶

Our study showed that the maximum reading distance was < 15 cm (near work) in myopic. This was in consistent with the results of Saw et al, Richer et al and Sood et al. who reported that excessive near work has been identified as one of the predisposing factor for high myopic incidence in medical students.^{5,7,9}

CONCLUSION

High prevalence of myopia was found among the medical students. The increased applicability of electronic gadgets, laptops, computers and smart phones were found to be the major associated risk factors along with the family history. Further studies are recommended for the prevention of increasing frequency of myopia among the young population.

CONFLICT OF INTEREST

There is no Conflict of interest

REFERENCES

1. Chalasani S, Jampala VK, Nayak P. Myopia among Medical

Students-A Cross Sectional Study in A South Indian Medical College. *Al Ameen J Med Sci.* 2012;5(3):233-242.

2. Chaudhry R, Ali M, Sheikh N. Frequency and underlying factors of myopia among medical students. *Biomedica.* 2011;27:154-160.

3. Woo WW, Lim KA, Yang H, Lim XY, Liew F, Lee YS et al. Refractive errors in medical students in Singapore. *Singapore Med J.* 2004;45:470-474.

4. Shah SP, Jadoon MZ, Dineen B, Bourne RR, Johnson GJ, Gilbert CE, et al. Refractive errors in the adult Pakistani population: the national blindness and visual impairment survey. *Ophthalmic Epidemiol.* 2008;15(3):183-190.

5. Saw SM, Chua WH, Hong CY, Wu HM, Chan WY, Chia KS, et al. Nearwork in early-onset myopia. *Invest Ophthalmol Vis Sci.* 2002;43:332-339.

6. Saw SM, Hong RZ, Zhang MZ, Fu ZF, Ye M, Tan D, et al. Near-work activity and myopia in rural and urban schoolchildren in China. *J Pediatr Ophthalmol Strabismus.* 2001;38:149-155.

7. Richler A, Bear JC. Refraction, nearwork and education: a population study in Newfoundland. *Acta Ophthalmol (Copenh).* 1980;58:468-478.

8. Gopalakrishnan S, Prakash MVS, Kumar R. A Study of Refractive Errors among Medical students in AIMST University, Malaysia. *Indian Med J.* 2011;105(11):365.

9. Sood RS, Sood A. Prevalence of myopia among the medical students in western India vis-à-vis the East Asian epidemic. *IOSR J Dent Med Sci.* 2014;13(1):65-67.

10. Dey AK, Chaudhuri SK, Jana S, Ganguly P, Ghorai S, Sarkar A. Prevalence of Refractive Errors in Medical Students. *Int J Health Sci Res.* 2014;4(8):98-102

11. Goldschmidt E, Jacobsen N. Genetic and environmental effects on myopia development and progression. *Eye* 2014; 28:126-133. DOI: 10.1038/eye.2013.254.

12. Alam H, Siddiqui I, Jafri SIA, Khan AS, Ahmed SI, Jafar M. Prevalence of refractive error in school children of Karachi. *J Pak Med Assoc.* 2008;58(6):322-325.

13. Reddy SC, Low CK, Lim YP, Low LL, Mardina F, Nursaleha MP. Computer vision syndrome: a study of knowledge and practices in university students. *Nepal J Ophthalmol.* 2013;5(10):161-168. DOI:10.3126/nepjoph.v5i2.8707

14. Rajeev A, Gupta A, Sharma M. Visual Fatigue and Computer Use Among College Students. *Indian J Community Med.* 2006;31(3):192-193.

15. Nnes E. Have you got 'screen sightedness'?-Smartphones are causing sight problems to soar, warns eye surgeon, "Daily Mail", United Kingdom, 2013, August 15. (<http://www.dailymail.co.uk/health/article-2394611>)

16. Hosub L, Sunjae L, Young Sang C, Seo Y, Shim E. A new posture monitoring system for preventing physical illness of smartphone users. *Consumer Communications and Networking Conference (CCNC), 2013 IEEE: 821-825.* DOI:10.1109/CCNC.2013.6488555

AUTHORS' CONTRIBUTIONS:

- *Conception, design, analysis and interpretation of data.
- ** Proof reading and revising it critically for important intellectual content.
- ***Manuscript writing.
- ****Data collection.