



REFRACTIVE ERROR AMONG MEDICAL STUDENTS: A CROSS-SECTIONAL ANALYSIS

Ophthalmology

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ABSTRACT

Aims & Objectives: Cross-sectional study to determine the prevalence of refractive errors among medical students attending Saraswathi Institute of Medical Sciences, Hapur. **Materials & Methods:** Randomly selected 660 medical students were subjected to evaluation of refractive errors in the department of Ophthalmology, Saraswathi Institute of Medical Sciences, Hapur over a period of eight months. All students were assessed for refractive errors using auto-refractometer (NIDEK ARK-1, NIDEK Corporation, Aichi, Japan). Refractive errors have been further categorized according to the Diopter power. **Results:** Refractive errors were found in 370 (56.06%) medical students out of which 240 (64.86%) were male students and 130 (35.13%) were female students. Myopia, 233 (63%) was the commonest type of refractive error. According to the categorization of refractive errors in terms of diopter (D) it was more common in 1-2.99D, category 2. **Conclusion:** From the present study the significance of prevalence of refractive errors among medical students is very much highlighted.

KEYWORDS

Medical students, Prevalence of refractive error.

INTRODUCTION

Refractive error is defined as the error in focussing light on retina, causing a decrease in visual acuity. Uncorrected refractive error remains the second commonest cause of global visual impairment next only to cataract. [1] A significant impact on learning and academic success has been attributed due to uncorrected refractive error. [2] High prevalence rate of refractive error has been seen among medical students and they were unaware of it.[2] It may be because they spend long hours reading and doing near work.[3] Studies on refractive error have primarily focused on school going children in different parts of India. [4-7] Very little is known about the refractive error among medical students. In this study both undergraduate and post graduate medical students have been included of Saraswathi Institute of Medical Science. The reason for selecting this group is that prevalence of refractive error is more among students pursuing higher studies as they spend long hours studying, writing and doing near work. It is believed information obtained from this study will help in making future planning and providing better eye care services.

MATERIALS AND METHODS

This is an institution based cross sectional study. This study was conducted at the Department of Ophthalmology, Saraswathi Institute Of Medical Sciences, Hapur, Uttar Pradesh, India for a period of 6 months from January 2023 to July 2023. Students of both undergraduate and post graduate were selected for this study and the sampling method obtained was simple random sampling. A total of 660 medical students were selected for this study. The Medical college has a medical screening policy for admitting students, where every student is screened for medical illness, refractive error problems and vaccination statuses. It has its medical board including a highly specialised ophthalmologist that takes the best corrected visual acuity using Snellen's chart and automated refractometer and some blood work followed by an interview. For our study we took reference of the medical screening record of the participating students. Students who had a history of surgical intervention like LASIK, were excluded from the study and others were evaluated for refractive errors. All of the students selected were evaluated for refractive errors using auto refractometer (NIDEK ARK-1, NIDEK Corporation, Aichi, Japan). The students with refractive errors: myopia, hyperopia and astigmatism were categorised in the following way category: 1; from 0.25 to 0.99D, Category: 2; from 1.0-2.99D, Category: 3; 3.00 to 5.99D and Category: 4; 6D or greater. Age groups were categorized as 18-23 years, 24-29 years, 30-35 years and 36 years or more. Prevalence of refractive error was calculated as a ratio of subjects detected to have refractive error, per hundred medical students.

RESULTS

A total of 660 medical students were included in this study. Out of which 450 were males (68.18%) and 210 were females (31.81%) with a male: female ratio of 2: 1. 370 (56.06%) medical students had refractive errors out of which 240 (64.86%) were male students and 130 (35.13%) were female students [Figure 1]. Myopia was the commonest type of refractive error affecting 235 (63.51%) medical students [Figure 2]. This was followed by Hypermetropia, comprising 91 (24.58%) medical students. Astigmatism was found among 44 (11.91%) medical students. Association of refractive error with age and sex was studied and it was more common in 18-23 years of age group ($p < 0.00$). [Figure 2 & 3]. While categorization of refractive error in terms of diopter (D), it was more common in 1-2.99D, category 2 [Figure 4].

Figure 1: Showing diagrammatic distribution of Refractive Errors

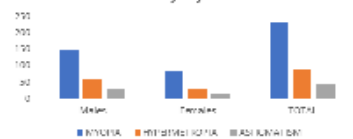


Figure 2: Myopia



Figure 3: Hypermetropia

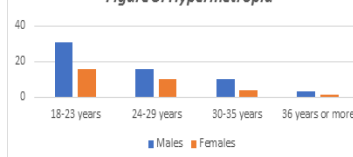
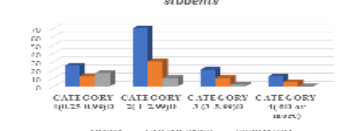


Figure 4: Categorical Prevalence of refractive errors per dioptre among medical students



DISCUSSION

The overall occurrence of refractive error in our study was 56.06%. Myopia (63.51%) was the common refractive error followed by hypermetropia (24.58%). This finding is similar to that of refractive error studies done on medical students in Pakistan (58%),^[8] Norway (50%)^[9] and Copenhagen (50.3%).^[10] Turkey (32.9%)^[11] reported a lower prevalence of refractive error among medical students. However, countries such as Taiwan (93%),^[12] Singapore (90%),^[13] China (71%)^[14] reported a higher prevalence of refractive error than that of our study. Our present study correlates with studies done on refractive error in Central India (55%),^[15] Western India (56%),^[16] Eastern India (56%).^[17] But findings of Southern India (70%)^[18] was much higher than our present study. The higher rate of refractive error in medical students was probably due to high level of educational achievement,^[19] above average intelligence,^[20] long and exhaustive study schedule, and prolonged near-work.^[21] Medical students are a group of young adults who spend long hours on reading and doing near work. With their rigorous study schedule that spans on an average of 5 to 6 years, they have been reported to be at high risk of myopia^[9,13,14,21] The precise pathogenesis of myopization of ocular refractive machinery by near work is yet to be fully established and understood. According to the recent theory, blurred retinal image that occurs during prolonged near work leads to myopia. This blurring of retinal images stimulates biochemical and chemical changes in sclera and choroid that leads to axial elongation.^[21]

CONCLUSION

Thus, from the present study the significance of prevalence of refractive error among medical students is highlighted. This study needs to be followed up with a multicentre longitudinal study tracking the progression of refractive error among medical students. In spite of some limitations in our present study, it can be concluded that myopia is the predominant refractive error among medical students and correction of refractive error will help reduce the visual impairment due to refractive error. This could benefit the society and nation at large.

Declaration by Authors

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Conflict of Interest: The authors declare no conflict of interest.

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