Section : Research Paper
ISSN 2063-5346

Study of Refractive Errors among the Medical Students Attending the Ophthalmology Department GMC Srikakulam

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DOI: 10.53555/ecb/2022.11.9.154

ABSTRACT

Introduction

The uncorrected refractive error remains the 2nd commonest cause of global visual impairment. It has a significant impact on learning and academic success. Studies on refractive errors have primarily focused on school-going children in India. A high prevalence rate of refractive errors was seen among the students pursuing medical education. Very little is known about the Prevalence of refractive error in medical students.

Aims and objectives

1. To assess the prevalence of refractive errors among medical students attending the ophthalmology department.
2. To learn any impact of their daily routine and other risk factors on the incidence and progression of refractive errors.

Materials and methods

This was a hospital-based cross-sectional study comprising 244 Medical students from the 4th semester (142 students) and 6th semester (102 students) of MBBS attending the Department of Ophthalmology. The study included a questionnaire and detailed Ophthalmic examination.

Section : Research Paper
ISSN 2063-5346

Results

152(62.29%) of 244 students had some or the other form of refractive error. Among those with refractive errors 51(33.55%) were male and 101(66.44%) females. In the Study participants, 138(90.78%), 10 (6.57%), and 4 (2.63%) were myopes, hypermetropes, and astigmatic subjects respectively. 92(37.70%) students had no refractive errors.

Conclusion

The prevalence of refractive errors was relatively high in medical students when compared to the normal population. Myopia is found to be a common error of refraction in medical students.

An association was found between the amount of close work and the amount of visual stress in the progression of refractive errors.

Keywords: refractive errors,medical students,visual impairment, myopia

Introduction

Uncorrected refractive error is defined as a presenting visual acuity of less than 6/12 in the better eye with an improvement of at least one line in Snellen's chart after refraction [1,2]. It is the leading cause of global moderate to severe vision impairment and the second most common cause of blindness[1,3]. Among the global population with moderate or severe vision impairment (216 million), uncorrected refractive error with 116 million subjects wasthe leading cause of visual impairment. India and China account for approximately 50% of global vision impairment and blindness due to uncorrected refractive errors[1,4,5]. A systematic review published in the issue of the Indian Journal of Ophthalmology estimates a 53% prevalence of at least 0.50 D of spherical equivalent ametropia (myopia 27.7%, hyperopia 22.9%) in India[6].

Refractive error has a significant impact on learning and academic success.Refractive errors can have many issues including educational loss, economic issues, low productivity, and impaired quality of life [7]. A high prevalence rate of refractive errors was seen among the students pursuing higher education (medical students).Very little is known about the Prevalence of refractive error in medical students as most studies on refractive errors were focused on school-going children in India. Therefore, we investigate the Prevalence in the present study.

Aims and objectives

1) To assess the prevalence of refractive errors among medical students attending the ophthalmology department.
2) To learn any impact of their daily routine and other risk factors onthe incidence and progression of refractive errors.

Section : Research Paper
ISSN 2063-5346

MATERIALS AND METHODS

This hospital-based cross-sectional study comprised 244 MBBS students attending the Department of Ophthalmology. Among 244 students, 142 were from the 4th semester (91 girls and 51 boys) and 102 were from the 6th semester (62 girls and 40 boys).The chosen study population was explained the study objectives and a written consent form was obtained from each student.The examination was carried out on both eyes by auto refractometer and cycloplegic refraction was done. Additional ophthalmological examinations were also done.A questionnaire was also structured Containing information about their daily routine, habits, and personal information to assess some risk factors and possible associations with the refractive errors. Details are enumerated below.

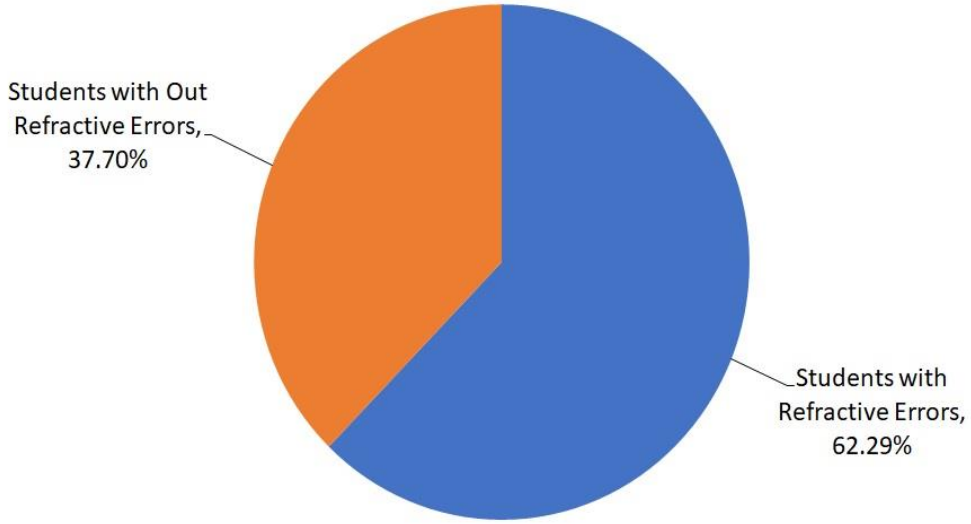

Fig 1: Prevalence of refractive errors among medical students

Section : Research Paper
ISSN 2063-5346

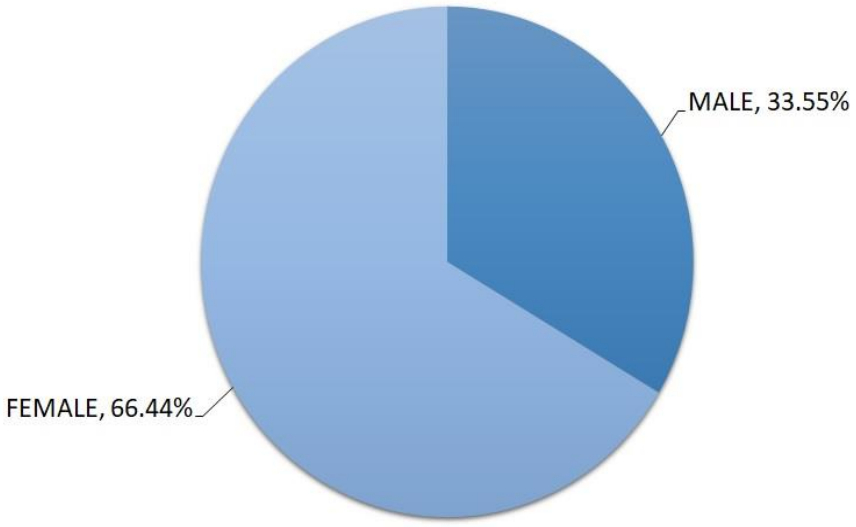

Fig 2: Gender-wise prevalence of refractive errors

Fig 3: Semester-wise prevalence of refractive error

Section : Research Paper
ISSN 2063-5346

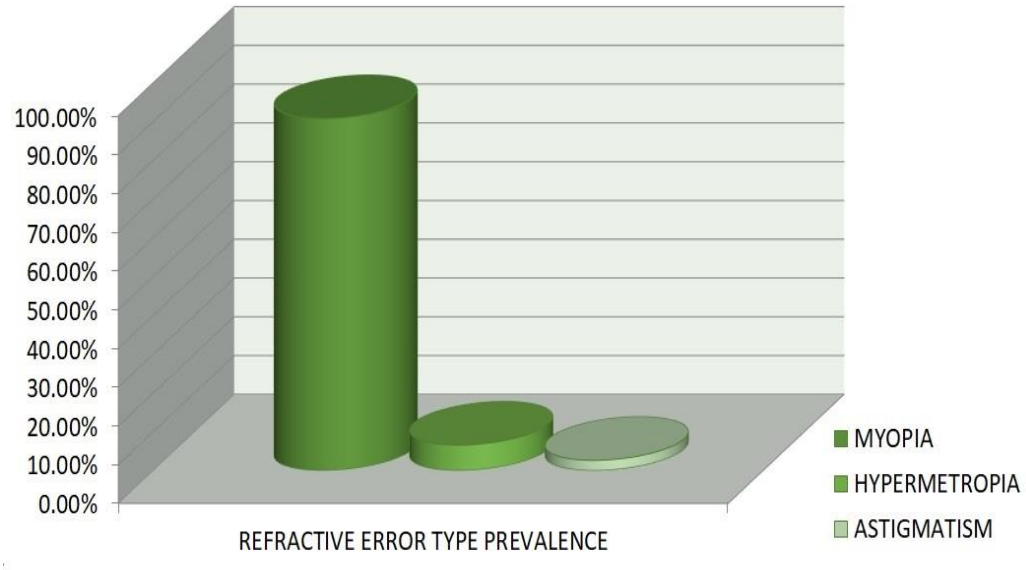

Fig 4: Prevalence of type of refractive error

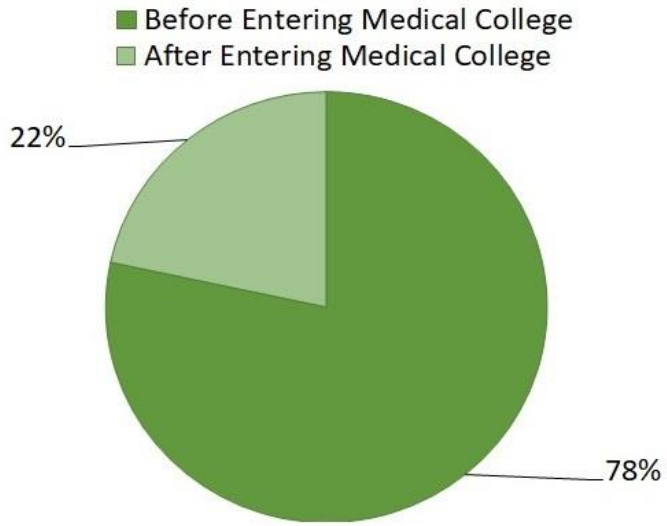

Fig 5: Time of Diagnosis of Refractive Error

Section : Research Paper
ISSN 2063-5346

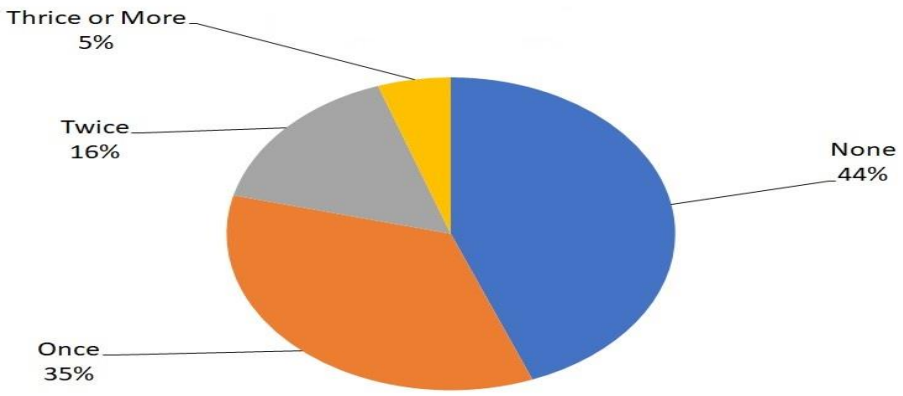

Fig 6: Number of times changing prescription after entering medical college

Statistical methods:

The questionnaire-based data were collected, organized, summarized, and analyzed.Chi-square tests were used to test the association among variables.For the analysis, $P<0.05$ was considered.

Results:

The study Comprised 244 Medical students from the 4th semester and 6th semesters of MBBS.142 students from the 4th semester and 102 students from 6th semester. 152(62.29%) of 244 students had some or the other form of refractive error[figure1]; With 89(58.55%) from the 4th semester and 63(41.44%) from the 6th semester. Among those with refractive errors 51(33.55%) were male and 101(66.44%) females [Figure 2]. In comparison 138(90.78%), 10 (6.57%), and 4 (2.63%) were myopes, hyperopes, and astigmatic respectively [Figure 4]92(37.70%) students had no refractive errors.

Fig 7: Comparison of Variables Between Students with Refractive Errors and Students without Refractive Errors

Section : Research Paper
ISSN 2063-5346

Comparison of variables between Students with and without Refractive errors and statistical analysis:

	Students with refractive error n=152(100%)	Students without Refractive error n=92(100%)	Chi - square value	P value	Stastically significant
Presence of Refractive error in any parent					
Yes	87(57.23%)	29(31.52%)	15.38	0.000088	Yes
No	65(42.76%)	63(68.47%)			
Hours for near work/studying/ Electronic gadget's					
Moderate	70(46.05%)	44(47.82%)	0.07	0.791	No
Intense	82(53.94%)	48(52.17%)			
	Students with refractive error	**Students without Refractive error**	**Chi –square value**	**P value**	**Stastically significant**
Hrs for online classes					
Moderate	130(85.52%)	82(89.13%)	0.64	0.423	No
Intense	22(14.47%)	10(10.86%)			
Intake of dietary supplements					
Yes	61(40.13%)	50(54.34%)	4.65	0.031	Yes
No	91(59.86%)	42(45.65%)			
Activity preferred during leisure time					
Indoor	75(49.34%)	43(46.73%)	0.13	0.71	No
Outdoor	77(50.65%)	49(53.26%)			
Light used during reading					
Moderate	149(98.02%)	92(100%)	1.815	0.177	No
Dim	3(1.97%)	0(0%)			

Section : Research Paper
ISSN 2063-5346

	Students with refractive errors	Students without Refractive errors	Chi-square value	P value	Stastically significant
Practice of eye exercises					
Yes	23(15.13%)	25(27.17%)	5.25	0.021	Yes
No	129(84.86%)	67(72.82%)			
Preferred position during reading					
Sitting	135(88.81%)	84(91.30%)	0.382	0.536	No
Supine	17(11.18%)	8(8.69%)			
Reading time					
Early morning	35(23.02%)	22(23.91%)	0.20	0.90	No
Night	42(27.63%)	23(25%)			
Evening	75(49.34%)	47(51.08%)			
Sleep onset					
Before 12am	70(46.05%)	44(47.82%)	0.07	0.79	No
After 12 am	82(53.94%)	47(51.08%)			

Comparison with other studies:

	Our study	Study by Khan,et Al; Refractive errors among Medical students	Study by Dharmesh K prevalence of Refractive errors and determinants of Myopia among Medical students
Prevalence of Refractive errors	62.29%	59.5%	48.3%
Gender wise prevalence			
Females	66.44%	53.7%	57.0%
Males	33.55%	46.2%	36.5%
Prevalence of types of refractive errors			
Myopia	90.78%	91.6%	90%
Hypermetropia	6.57%	4.2%	0%
Astigmatism	2.63%	4.2%	10%

Section : Research Paper
ISSN 2063-5346

	Our study	Study by Khan,et Al; Refractive errors among Medical students	Study by Dharmesh K Prevalence of refractive errors and determinants of Myopia among Medical students
Parental history of Refractive errors	Significant	Significant	Significant
Intense near work	Higher	Significant	Significant
More hrs for online classes	Higher	-	-
Outdoor activity	Higher	Significant	Significant
Dietary supplements	Significant	-	Significant
Light used during reading	Higher	Higher	Significant

	Our study	Study by Khan et Al; Refractive errors among Medical students	Study by Dharmesh K Prevalence of refractive errors and determinants of Myopia among Medical students
Eye exercises	Significant	-	Significant
Supine position during reading	High	High	-
Sleep onset after 12am	High	Significant	-
Reading Time	High	Significant	-

Section : Research Paper
ISSN 2063-5346

Discussion:

In the present study,the prevalence rate of refractive errors among medical students is 62.29% which was higher than the study Gujarat (55.6%) by Kathrotia et al,[8] Maharashtra (54.94%) by Wakode et al, [8] and Baroda (54.06%) by Rajdeep and Patel et al[10].The prevalence of myopia in our study was 90.78% which is almost similar to the study conducted by Khanet al [11].Our findings were also similar to the study conducted by Dharmesh K Patel et al [12] among students in GMERS Medical College, Patan, Gujarat,India.

The high prevalence of myopia in our study is supported by the studies on medical students in India(77.7%), Singapore (82%), and Malaysia; where myopia was found to be higher as compared with other types of errors of refraction.Refractive errors are more prevalent among females(66.44%) in our study which was supported by similar results of 64% in the study conducted by Khan et al [11]. Similar results were seen in a survey of medical students in Saudi Arabia and Turkey.Multiple studies have demonstrated an association of near-work with the prevalence of Refractive errors, particularly myopia[13].

Our Study signifiedthat students involved in daily sports activities and spent less time indoors had a low prevalence of refractive error. A similar association was reported in other studies too [14]. The presence of Refractive errors in parents was a significant contributing factor in the prevalence of refractive errors in agreement with similar studies done [15,16]. It was found that the students who regularly took dietary supplements, studied under appropriate light, and practiced regular eye exercises had less chance of developing refractive errors. However, this association is not supported by adequate evidence from studies.

CONCLUSION:

1. Prevalence of refractive errors was relatively high in medical students when compared to the normal population.
2. Myopia is found to be a common error of refraction in medical students.
3. An association was found between the amount of close work and the amount of visual stress in the progression of refractive errors.
4. A regular check-up is essential to timely correct the error and prevent deterioration of the vision.

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