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Refractive errors in medical student of Misan University

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Abstract:

Refractive errors are becoming more of a problem in many countries, with prevalence rates in many Arabian regions countries reaching epidemic features.The study aimed to study the prevalence of various errors of refraction among the medical students of College of Medicine.

This is a cross-sectional clinical study conducted at Misan University Ophthalmological Clinic over a period of 6 months. The study population comprised 377 students from different academic stages.The selected study population was explained the objectives of the study and a written consent form that stated the purpose, methods, risks, benefits, and the assurance of the confidentiality of the data was obtained from each student. After giving the consent,some of students was examined. The examination was carried out by an optometrist without using cycloplegia. Both right and left eyes were thoroughly examined by auto refractometer.

We enrolled 377 students of our College and found that182(48.2%) were have refractory errors, of them, 34% males and 65.9% were females with significant difference (P=0.027). Regard, myopic errors was diagnosed in 144(79.1%) of students. Hyperopia was recorded in 3.2% of whole errors. The astigmatism presented in 17.6% of all students. Sometimes, we found that astigmatism was overrepresented in the myopic group. The refractive errors and mainly myopia seen to be increased with higher stages in our College from 39.% in the first stage to 79.3% in the sixth stage. Although most student prefer refractive surgery, but most of them uses glasses as 74.7%.

Myopia found to be common error of refraction in young adults, followed by astigmatism, then hyperopia. A regular checkup is essential to timely correct the error, and to prevent deterioration of the vision.

Keywords:*Myopia, Astigmatism, Hyperopia, Refractive errors, Refractometer*

I. Introduction

Refractive errors are becoming a major problem in many societies, with prevalence rates of myopia in many Asian countries, and might reaching epidemic proportions [1,2]. Though correctable using spectacles and contact lenses, refractive errors present a reasonably large economic burden [2]. These vision problems happen when the

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shape of the eye keep you from focusing well [1,3]. The cause could be the length of the eyeball (longer or shorter), change in the shape of the cornea, or/and aging of the lens [3].There are four main refractive errors [1-4]. The first one is myopia or nearsightedness, define as a condition of the eye where light focuses in front of, instead of, on the retina, and this cause distant objects to be blurry while close objects appear normal [5]. The second is hyperopia or farsightedness, is a condition of the eye where light focuses in behind, instead of, on the retina, and it lead to make close objects to be blurry while distant objects appear normal [5]. The third one is astigmatism, in which the eye dose not focus light evenly on the retina, and this cause distorted or blurred vision at all distances [5]. Lastly, presbyopia which refer to inability of focusing close up as a result of aging [5].

The aim of the present study was to determine the prevalence of refractive errors in medical student of our university in relation to multiple factors like: age,gender, classes and type of reading.

II. Methods

Study design and setting

A cross-sectional study of a total of 377 medical students (class I: 110; class II: 82; class III: 65; class IV: 48; class V: 33; class VI: 29) form Faculty of Medicine/ University of Misan, aged 19-24 years, were invited to participated in our studyat period of 6 months from 30th June to 30th December 2018.

Participants

The participation rate was 139(36.8%) males, and 238(63.1%) females. Any students not suffering from any types of refractive errors were excluded.Demographic data such as age,gender and related refractive error questionnaire as correction intervention of errors and reading type as paper or tablet were collected.

Students informed consent

Written consent was obtained via a consent formthat stated the objectives of the study, procedures,risks, benefits, and the assurance of confidentialityof the resulted data was obtained from each student.

Ophthalmological examination

After giving the consent, the ophthalmological examination was performed for each students over a one week period in the period of the study, the examination was carried out by an optometrist without using cycloplegia. Both right and left eyes were thoroughly examined by auto refractometer and on the average three readings of the refraction measurements were taken.

Statistical analysis

The readings were recorded on a data sheet of every individual, and the statistical analysis was done by Microsoft Office Excel worksheet.Descriptive analyses was performedusing Statistical Package for Social Sciences

(SPSS)version 24.0 (NY, US). Theprevalence rates for each refractive error were calculated. Proportionswere compared using the chi-square test.

III. Results

We enrolled 377 students of our College andfound that182(48.2%) were have refractory errors, of them, 34% males and 65.9% were females with significant difference (*P*=0.027),**(Table 1)**.Regard, myopic errors was diagnosed in 144(79.1%) of students. Hyperopia was recorded in 3.2% of whole errors. The astigmatism presented in 17.6% of all students. Different proportions and percentage of refractory errors over male, and female of each classes in the College were calculated,**(Table 2)**.Of which, only errors distribution among gender of students of class II was statistically significant different (*P*=0.014). Sometimes, we found that astigmatism was overrepresented in the myopic group. There was no significant difference between both eyes errors because no data calculated. The refractive errors and mainly myopia seen to be increased with higher stages in our College from 39.% in the first stage to 79.3% in the sixth stage,**(Figure1)**. The students with refractive errorswere reading and studying in both paper sheets and laptops **(Table 3)**,but student without refractive errors are studying and reading paper sheets more than laptops, so reading paper might be a preventive from refractive errors **(Figure 2)**.Although most student prefer refractive surgery, but most of them uses glasses as 74.7%, followed by contact lenses with strong significant difference (*P*<0.000), **(Table 4)**.

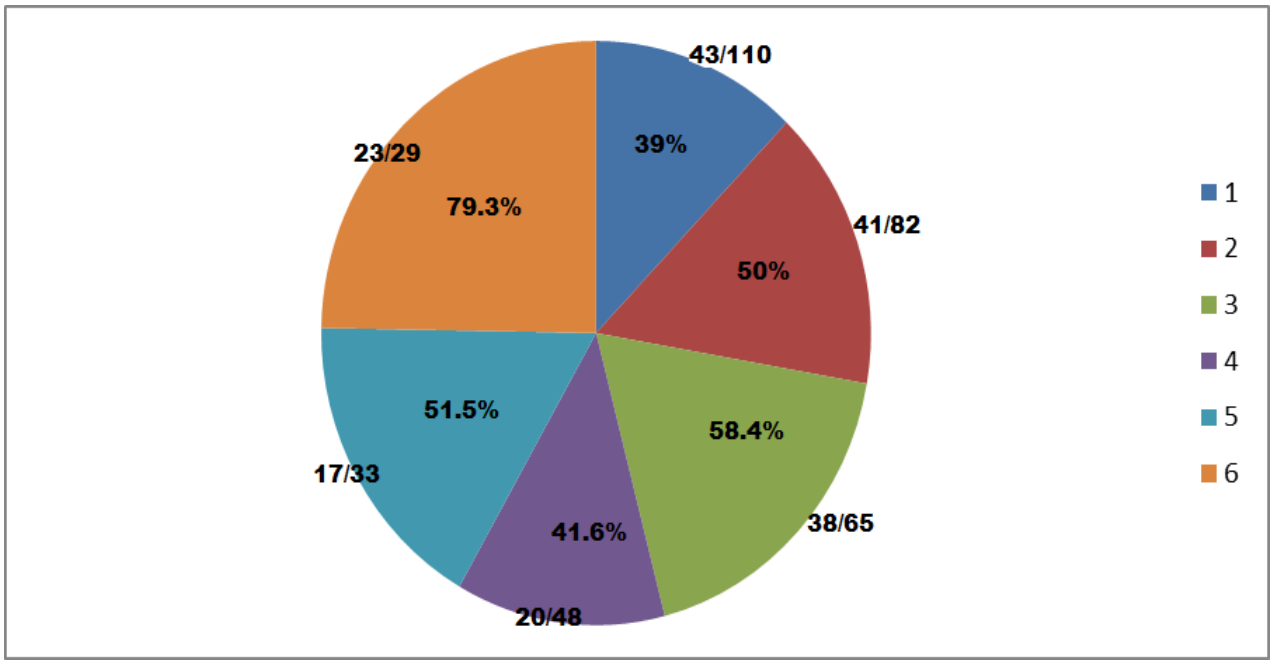

Figure1. Students suffered from refractory errors of each stages.

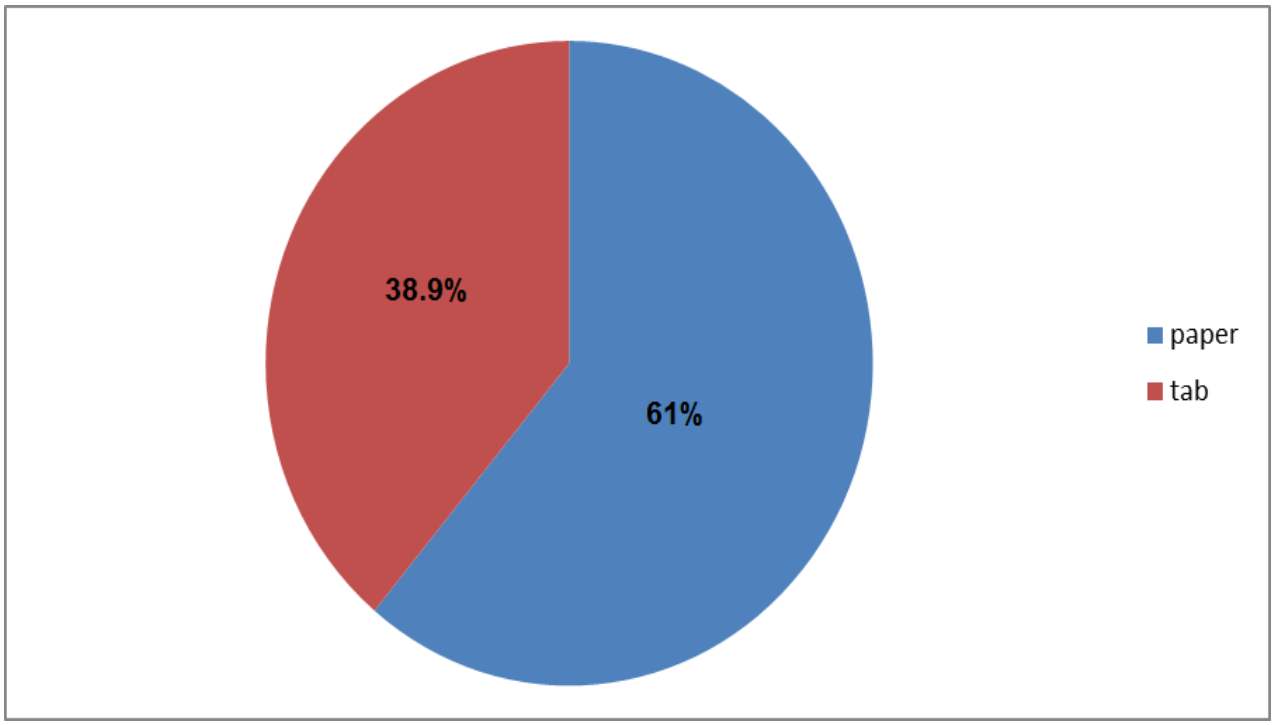

Figure 2. Students without refractive errors are reading paper and laptops.

Table 1. Prevalence of refractory errors.

Gender	Errors		Total
	Present	Absent	
	No. (%)		
Male	62 (34)	77 (39.5)	139 (36.8)
Female	120 (65.9)	118 (60.5)	238 (63.1)
Total	182 (48.2)	195 (51.7)	377
Chi-square is 31.188 The *p*-value is 0.027			

Table 2. Refractory errors types relation to gender of each classes.

Class	Gender	Refractory errors			Total	*p*-value
		Myopia	Hyperopia	Astigmatism		
		No. (%)				
1	M	12 (8.3)	0	2 (6.2)	14 (7.7)	0.051
	F	23 (15.9)	0	6 (18.7)	29 (15.9)	
2	M	8 (5.5)	3 (50)	2 (6.2)	13 (7.1)	0.014
	F	22 (15.3)	1 (16.7)	5 (15.6)	28 (15.4)	
3	M	9 (6.3)	1 (16.7)	2 (6.2)	12 (6.6)	0.081
	F	22 (15.3)	0	4 (12.5)	26 (14.3)	
4	M	9 (6.3)	0	1 (3.1)	10 (5.5)	0.388
	F	7 (4.8)	1 (16.7)	2 (6.2)	10 (5.5)	
5	M	7 (4.8)	0	2 (6.2)	9 (4.9)	0.868
	F	7 (4.8)	0	1 (3.1)	8 (4.3)	
6	M	3 (2.1)	0	1 (3.1)	4 (2.1)	0.053
	F	15 (10.4)	0	4 (12.5)	19 (10.4)	
Total		144 (79.1)	6 (3.2)	32 (17.6)	182	

Table 3. Refractory errors and reading modes.

Class	Gender	Reading mode		Total	*p*-value
		Paper	Tablet		
		No. (%)			

1	M	9 (9.3)	5 (5.9)	14 (7.7)	0.427
	F	22 (22.6)	7 (8.2)	29 (15.9)	
2	M	10 (10.3)	3 (3.5)	13 (7.1)	0.014
	F	10 (10.3)	18 (21.1)	28 (15.4)	
3	M	3 (3)	9 (10.6)	12 (6.6)	0.01
	F	18 (18.5)	8 (9.4)	26 (14.3)	
4	M	3 (3)	7 (8.2)	10 (5.5)	0.764
	F	6 (6.1)	4 (4.7)	10 (5.5)	
5	M	4 (4.1)	5 (5.9)	9 (4.9)	0.818
	F	4 (4.1)	4 (4.7)	8 (4.3)	
6	M	0	4 (4.7)	4 (2.1)	0.363
	F	8 (8.2)	11 (12.9)	19 (10.4)	
Total		97 (53.3)	85 (46.7)	182	

Table 4. Refractory errors and treatment

Errors	Glasses	Refractive surgery	Contact lenses	P value
	No. (%)			
Myopia	118 (86.7)	10 (83.3)	16 (47)	<0.000
Hyperopia	6 (4.4)	0	0	
Astigmatism	12 (8.8)	2 (16.6)	18 (52.9)	
Total	136 (74.7)	12 (6.6)	34 (18.6)	182

IV. Discussion

Myopia was found to be the most common type of ametropia. Refractive errors were more common in females 65.9% than in males 34%. This correlates with a Greek study which reported that the prevalence rate of myopia was higher in female students than male [2]. Myopia is the most prevalent ocular disorder globally, and it is on the rise and also reaching epidemic proportions [3]. The prevalence of myopia in US is estimated to be 25% and in India to be 19% [3,4]. In the Asian countries, prevalence rates are higher [1]. The prevalence rate of myopia in Singapore medical students has been reported to be more than 82% which is higher as compared to our study data [5]. The myopia rates in Asia are considered to be higher than in Europe [1], but a Danish study of 147 medical students reported figures of 50%, while the Norwegian study on 140 medical students reported a prevalence rate of 50.3% [6,7]. The occurrence rate in our study population of 377 medical students was only 48.2%. The severity of myopia has been reported to be associated with the level of educational attainment [8]. Medical students are a select population with a high level of education as well as above average intelligence, and this might explain the high prevalence rates of myopia [10].In addition, the long and intensive study programs of medical school involve extensive near work such as reading and writing [11], the amount of near work maybe cause myopia and astigmatism [12]. WHO reported that uncorrected refractive error remain the second commonest cause of global visual impairment next only to cataract [13]. However, the occurrence of myopia among our study group was not so alarming as the prevalence rates reported in Singapore, Taiwan and Hong Kong [1,5,12-14].

V. Conclusion

Myopia is the predominant refractive error detected among medical students. The occurrence of myopia was found to be higher among high classes. Female students showed a higher rate of refractive errors. It's increasing with laptop utilizing for studying. Prospective studies are required to be done among professional students to confirm the late onset of myopia and its progression during the course of study.

Ethical clearance- Taken from Faculty of Medicine/ Misan University committee (Ref. 2019556).

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Conflict of Interest-nil

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