Original Article

Prevalence of Laser Vision Correction Among Qassim Medical Students

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Abstract

Background:
Laser vision correction is considered one of the most common optional eye surgeries done worldwide. It includes a variety of procedures with changing indications in modern ophthalmology. The aim of this study is to determine the prevalence of laser vision correction (LVC) among medical students at the college of medicine, Qassim University, Saudi Arabia and to assess their level of satisfaction.

Methods:
Cross-sectional observational randomized questionnaire study. The questionnaire was distributed to 200 medical students randomly selected from each academic year, where the self-reported response was recorded.

Results:
Responses were completed by 195 out of 200 subjects. Of the 195 subjects, 104 (53.3%) reported that they had refractive errors. Myopia was the most prevalent type of refractive errors. Of the 104 students with refractive errors, only 10 (9.6 %) had undergone refractive surgery. Eight out of ten were females, and the two were males. The 94 of 195 participants who did not do LVC were satisfied with glasses or contact lenses while a few of them were afraid of postoperative complications. More than 90% of those who underwent refractive were satisfied after the refractive surgery.

Conclusion:
The prevalence of refractive errors among medical students of Qassim University is comparable to general population. The prevalence of LVC among them is also comparable to international published reports.

Keywords:
Laser vision correction, Refractive errors, Myopia.

الملخص

خلفية:
يعد تصحيح النظر بالليزر أحد أكثر العمليات الإختيارية شيوعاً في العالم. يشمل تصحيح النظر عدة أنواع مختلفة من العمليات لأسباب متغيرة في طب العيون الحديث. الهدف من هذه الدراسة هو معرفة مدى إنتشار عمليات تصحيح النظر بالليزر بين طلاب كلية الطب في جامعة القصيم وقياس مدى رضاهم من هذه العمليات.

طريقة البحث:
: دراسة مقطعية رصدية مبنية على إستبيان عشوائي. الإستبيان وزع على ٢٠٠ طالب طب عشوائياً من كل سنة دراسية و تم تسجيل إجاباتهم وحفظها

النتائج:
أكملت الإجابات بعدد ١٩٥ من أصل ٢٠٠. من أصل ١٩٥ ، ١٠٤(٥٣,٣٪) أجابوا بأن لديهم عيوب إنكسارية. قصر النظر كان أكثر الأنواع انتشاراً. عشرة (٩,٦٪) فقط من أصل ١٠٤ الذين كانت لديهم عيوب إنكسارية قاموا بعملية تصحيح النظر. ثمانية من أصل هؤلاء العشرة كانو إناث وإثنان كانو ذكور. أربعة وتسعون من المشاركين ١٩٥ الذين لم يخضعوا لعمليات تصحيح النظر كانوا بالمجمل راضين مع استخدامهم للنظارات والعدسات وقليل منهم كانوا خائفين من مضاعفات العملية. أكثر من ٩٠٪ من المشاركين كانوا راضين بعد قيامهم بعملية تصحيح النظر.

الخلاصة :
معدل انتشارأخطاء العيوب الإنكسارية بين طلاب الطب في جامعة القصيم مقارب لعامة السكان بالمملكة. كما أن معدل انتشار عمليات تصحيح النظربين الطلاب مقارب لإنتشارها عالمياً.

INTRODUCTION:

Refractive errors are the most common cause of vision loss after cataract in different age groups and are leading cause of visual impairment [1]. Moreover, pervious researches have shown that children and adults who have refractive errors commonly do not get the ideal level of vision correction [1]. Refractive errors may cause difficulties in a person's daily life activities related to vision [2]. Glasses and contact lenses are considered the first line option for refractive errors correction in all age groups [3]. In the last two decades, laser vision correction (LVC) has got more popular and nowadays the most popular optional surgery in the world [3].

The prevalence of myopia is increasing notably in Asians [4]. It has reached 70% in some Asian countries, 50% in England and 25% in North America [4]. Other than geographic differences, gender and race may affect the risk of myopia [4,5]. Previous studies showed that the prevalence of myopia among medical students in selected universities in Saudi Arabia was 53.5% [6].

Refractive errors have social, economic and educational impact, and its economic impact is substantial in the world [7]. Furthermore, the average annual cost of myopia for every 12 to 17-years-old student in Singapore can reach up to 148 U.S. Dollars [8].

With the use of improved ophthalmic instruments, LVC has shown a noticeable increase in the safety and efficacy of surgical results [9]. Types of laser vision correction can be grouped as either surface treatment like photorefractive keratectomy (PRK), in which the epithelium is removed before the cornea is subjected to laser, or laser in situ keratomileusis (LASIK), in which a corneal flap is fashioned and flipped before laser is applied to the underlying cornea, and then the flap is replaced back [10,11]. Selection of procedure type depends on detailed history and complete ocular examination for candidacy status. One of the very important post-operative risk to be considered is post Lasik ectasia in which the cornea gets thinned with increasing irregular astigmatism and deterioration of visual acuity [19].

In this study we are looking for the prevalence of LVC among medical students of Qassim University and their postoperative satisfaction.

METHODS:

This is a cross-sectional observational study conducted in the month of April 2019. The study population included all students of Qassim University College of medicine in Qassim province, Saudi Arabia. Total students were 707 (450 Males, 257 Females). Stratified random sampling was taken from each year. The sample size was 200 (73 Females and 127 Males). With predicted prevalence of 8% the confidence interval was 4% and alpha level of 0.05, which was verified by a statistician.

Questionnaire was used as a printed copy and distributed to all participating students in a private and anonymous manner. The participants were given the option to withdraw at any time during the survey. Questions were designed to elicit information in a concise and objective manner. In addition, logics were used in the question so the subsequent answer would base on prior response. Questions included 3 main categories, which elicit 12 responses in demographic, candidacy status and satisfaction rate.

Statistical analyses were performed using Statistical Package for Social Sciences (SPSS) version 21 (IBM, SPSS, Chicago, IL, USA). In all analyses, $P \leq 0.05$ was considered statistically significant.

Ethical approval and informed consent:

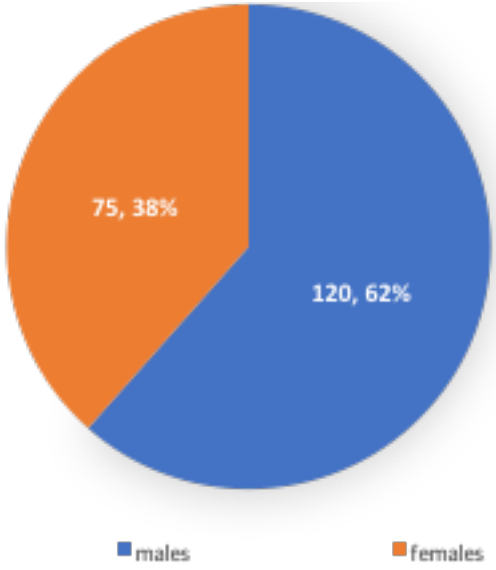
This study was approved from the institutional review board at research center in college of medicine, Qassim University. Informed consent was taken from all participants. Survey

was optional and participants were able to withdraw any time.

RESULTS:

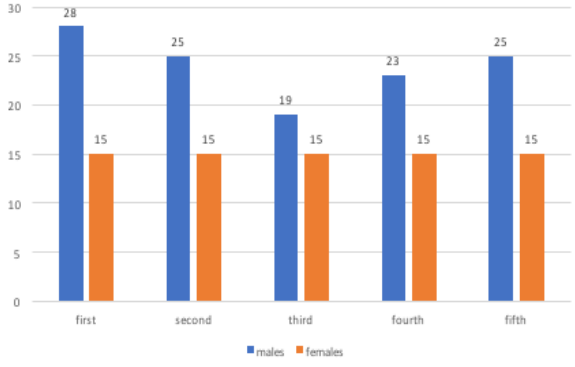
Participants received a hard copy of the questionnaire by the data collectors, this method insured that most participants responded.
Of the 200 students from different academic years, 195 responded, 120 (61.5%) were males, and 75 (38.5%) were females as represented in Figure 1.

Figure 1. the distribution of Participants according to gender.



The breakup of students selected from each academic year is summarized in Figure 2.

Figure 2. The distribution of participants in each academic year



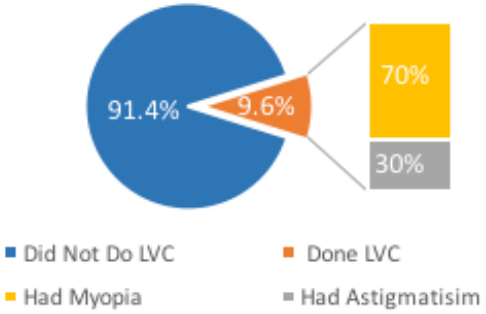
Distribution of Refractive Errors in the Overall study

Of the 195 participants, 91 (46.7%) reported they had no refractive errors and 104(53.3%) reported they do have. Sixty-six participants (33.8%) had myopia. Only 24 (12.3%) reported having astigmatism, and 8 (4.1%) had hyperopia. Lastly, 6 (3.1%) reported they don't know their refractive errors.

Rates of Laser Vision Correction

Out of 104 participants who had refractive errors, only ten (9.6 %) had undergone a refractive surgery. Eight out of ten were females and the two were males. Out of the total 195, only (5.1 %) had a refractive surgery.
The procedure of choice for majority 5 (50%) was LASIK, whereas 3 (30%) underwent PRK, the remaining 2 (20%) did not know the type of procedure.
The most prevalent refractive error among participants who had LVC was myopia as seen in Figure 3.

Figure 3. The distribution of participants who had refractive errors



Distribution of reasons for not having LVC

The 98 of 195 participants who provided reasons for not having the refractive surgery are represented in Table 1.

Table 1. Reasons for those with refractive errors and not having Refractive Surgery.

Reasons	N	Percent
Fear of complications	12	12.8%
High cost	14	14.9%
Waiting for better alternatives	6	6.4%
Satisfied with glasses or contact lenses	46	48.9%
Timing issue	13	13.8%
Other	3	3.1%
Total	94	100.0%

First reason was satisfaction with glasses or contact lenses in 46.9%, second was high cost in 14.3%, and closely followed by timing issue 13.3% and fear of complications in 12.2%, waiting for better alternatives 6.1% and other reasons were 7.1%.

Satisfaction Rates

The participants who had refractive surgery were asked about their satisfaction, 7 (70%) were completely satisfied and 3 (30%) were mostly satisfied and only one of these 30 percent not satisfied who reported having a complication. When we asked the participants" Are you better off having had the refractive surgery" all answered yes.

DISCUSSION:

The prevalence of LVC of refractive errors in Saudi adult population is not well known. The variation in refractive errors usually accounts for environmental, geographic, cultural, economic and demographic variables [12-14]. Few studies reported the prevalence of refractive errors in Saudi adult population. In these studies, the proportion of myopia ranging from 24.4% to 53.7%, astigmatism ranging from 9.5% to 15% and hyperopia ranging from 2.2% to 15% as seen in table 2 [15-18].

Table 2. Comparison of refractive errors prevalence studies in Saudi adults.

Study	Sample size	Emmetropes	Myopia	Astigmatism	Hyperopia
Al-Rashidi, et al. study	162	41.3%	53.7%	1.2%	3.7%
Alsaqr A, et al. study	998	44.5%	53.3%	15%	2.2%
Parrey M, et al. study	966	54.2%	24.4%	9.5%	11.9%
Alsaif B, et al. study	338	45.6%	47.9%	Not mentioned	6.5%
Current study	200	46.7% + 3.1% Did not know	33.8%	12.3%	4.1%

In the current study myopia accounts for 33.8%, astigmatism 12.3% and hyperopia 4.1%, which is comparable to previously reported publications in Saudi adult population. In the current cross-sectional study, self-reported prevalence of LVC was obtained from participants. Findings indicated that 9.6% reported having LVC and majority of them having myopia. To best of our knowledge this is the first reported prevalence of LVC in Saudi Arabia. Comparing our results to international published report from United State where the estimated overall prevalence of LVC was 13.1% of general population [13].

Kezirian GM. et al and his colleagues presented a prospective randomized study on prevalence of LVC in ophthalmologists who perform refractive surgery [12]. They found 62.6% of ophthalmologist who were candidate for the surgery underwent LVC. This is about 4 times more in comparison to the reported 13.1% prevalence of LVC among general U.S population [13]. This increase might be attributed to the increase awareness and safety of the procedure among ophthalmologist who perform refractive surgery. In the same study 37.4% of ophthalmologist who were candidate did not undergo LVC. About 92.5% of them prefer to wear glasses or contact lenses and 5% had concern or fear of complication. Ninety percent of our participants who had refractive errors did not undergo LVC. About 46.9% were satisfied with glasses or contact lenses, 14.3% had concern regarding high cost of procedure, and 12.2% reported fear of complication. This will emphasize the necessity for increased awareness program among general population and in particular those in medical and paramedical field. Fifty percent of our participants who had got LVC reported that they did LASIK, 30% underwent PRK, and 20% were not sure what type of procedure they did. In comparison, the ophthalmologist study reported 65.7% underwent LASIK and 34.3% did PRK [12]. Although our result is comparable to international published report, we emphasize and stress on proper patient selection for type of procedure since we have increasing number of keratoconus cases and post LASIK ectasia in Saudi Arabia [19].

Satisfaction rate among our participants with LVC was high with 70% were completely satisfied post-surgery and 30% were mostly satisfied. When we ask our participant "Are you better off having had the refractive surgery" All answered yes. This again emphasizes their satisfaction. This agrees with other published report by J. Lellouch et al on evaluation of vision quality after laser vision correction in healthcare professionals [14]. Ninety percent were satisfied with postoperative vision quality, 92.8% would have the procedure again, and 94.6% would recommend it to their family and patients.

This study does have limitation. All participants were from one place with narrow age range, so the results cannot be generalized. The degree to which the students in this study can be representative to all medical students is not known. These limitations should be considered in the interpretation of the results, which cannot be overcome.

Conclusion:

refractive surgery is safe procedure with very high satisfaction rate among our participants, which is comparable to international reports. Proper preoperative counseling and patient selection is needed to prevent post LASIK ectasia. This necessitates increase awareness program about safety and efficacy of LVC.

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