Refractive surgery in Israel Defense Forces recruits

Josepha Horowitz, MD, Eedy Mezer, MD, Tzippora Shochat, MSc, Yossi Mandel, Gila Buckman, MD, Adi Sasson, MD, Orna Geyer, MD

PURPOSE: To determine the prevalence of refractive surgery history in recruits for military service in the Israel Defense Forces (IDF) between 1998 to 2005 and to evaluate the effect of surgery on the recruits’ fitness to serve in combat units.

SETTING: Surgeon General’s HQ, Medical Corps, Israel Defense Forces.

METHODS: The computerized medical records of all ametropic Israeli army inductees were reviewed. They included spectacle-wearing, contact lens–wearing, and post refractive–surgery individuals who were examined in the recruitment office before their compulsory military service. The extracted data from the personal files consisted of the assignment to combat units of those who had refractive surgery and those who wore corrective eyewear and the first and last military position of all ametropic recruits who were assigned to combat units.

RESULTS: Five hundred ninety-seven inductees (513 men, 84 women) had refractive surgery before their military service during the study period. The prevalence of recruits who had refractive surgery increased from 0.8/1000 ametropes in 1998 to 4.9/1000 ametropes in 2005. Significantly more recruits who had surgery (73.5%) than recruits who wore corrective eyewear were assigned to combat units ($P<.001$). The dropout rate from combat units of the former was significantly lower than that of the latter (13.1% versus 29.2%) ($P<.001$).

CONCLUSIONS: More corrective eyewear users had refractive surgery before their IDF military service, and relatively more of them applied for combat duty. The high percentage of recruits who had refractive surgery who serve uninterruptedly in combat units indicates that the procedure has no deleterious effect on the recruits’ fitness.

PATIENTS AND METHODS

The patients in this study were all recruits with an abnormal refractive eye condition (ie, myopia, hyperopia, or astigmatism) among all military service candidates for the IDF between 1998 and 2005. The relevant data were retrieved from these records to calculate and compare the prevalence of previous refractive surgery in the recruits. Soldiers who had refractive surgery during the course of their military service were not included. Most ametropic recruits were between 17 years and 20 years; the older ones were mostly new immigrants or individuals whose compulsory military service had been deferred because of studies. In the IDF medical classification system, entries in the medical profile, including the use of eyeglasses or contact lenses and the history of refractive surgery, of every candidate for military service are encoded. Each candidate whose uncorrected visual acuity (UCVA) is worse than 20/30 in 1 eye and whose UCVA improves with optical correction is considered ametropic, and the need for correction is noted.

The second objective of this study was to ascertain whether refractive surgery presented an obstacle to the soldiers’ fitness for combat duties. The percentage of recruits who had refractive surgery and were assigned to combat duty each year of the study was determined and compared with the percentage of corrective eyewear users who were assigned to similar units during the same time period. Also compared between the 2 groups was the dropout rate from combat units during the compulsory service.

Statistical analysis included the chi-square test to compare proportions between the 2 groups. The Pearson correlation coefficient (r) was calculated to assess the increase by year.

RESULTS

Patients

The analysis comprised 597 recruits (513 men, 84 women) who had refractive surgery before their conscription to military service between 1998 and 2005. During the 8 years of this study, the prevalence of recruits who had refractive surgery increased from 0.8/1000 ametropes in 1998 to 4.9/1000 ametropes in 2005. Men had refractive surgery 5 times more frequently than women (Figure 1).

Over three fourths of the operated male recruits (395/513, 77%) were between 17 years and 20 years of age. From them, a large subgroup (n = 84) of male recruits who were 18 years or younger at the time of their prerelruitment medical examination was extracted; analysis of this group showed an increase in the prevalence of refractive surgery history from 0.44/1000 in 1998 to 2.89/1000 in 2005 (r = 0.874, P < .005) (Figure 2).

Combat Fitness

According to their general medical profile, approximately 60% of all ametropic male recruits fulfilled the criteria for combat duty, and the numbers were similar between the 2 study groups. Specifically, the combat-fit men comprised 63% of those who had refractive surgery and 56% of corrective eyewear users. There was, however, a significant difference between the groups in the numbers eventually assigned to combat duty; specifically, 73.5% of recruits who had refractive surgery and 51.3% of the corrective eyewear users (P < .001). Moreover, the percentage of assignment to combat duties was lower among the men who had refractive surgery until 2000, but was higher thereafter. Finally, although there was a significant increase in the numbers of recruits who had refractive surgery and were assigned to combat units (from 25.0% in 1998 to 83.5% in 2005) (P < .001), there was no change in the percentage of combat-duty assignment among the corrective eyewear users (Figure 3). Assessment of the last military position of the recruits who had refractive surgery who were assigned to combat units showed that most (86.9%) had persevered in their units until the end of their compulsory military service or until the close of this study. The rate of dropout from combat units of those who had refractive surgery was significantly lower than the dropout rate of corrective eyewear users; that is, 13.1% and 29.2%, respectively (P < .001) (Figure 4).
DISCUSSION

Admission to combat units of the IDF, especially elite units, has always been and continues to be enormously prestigious in the greater part of Israeli society. Refractive laser surgery had lowered the physical profile of draftees until November 2001, thus preventing operated recruits from qualifying for elite combat units. This policy was changed as of December 2001, when laser in situ keratomileusis replaced photorefractive keratectomy (PRK) and laser surgery was no longer considered a medical limitation. This change in criteria is reflected in the results in our study: There was an increasing incidence of refractive surgery in military service candidates for the IDF during this 8-year study (0.8/1000 in 1988 and 4.9/1000 in 2005), with the greatest increase between 2002 and 2005.

Refractive surgery before the age of 21 years has not become common practice because of expected progression of myopia, yet most (77%) of the 513 male recruits who had refractive surgery were between 17 years and 20 years of age, with 84 of them being 18 years or younger. To our knowledge, this is the first published report of a large group of subjects who had refractive surgery at such a young age. Refractive laser surgery is FDA-approved mostly for individuals aged 21 years and older (U.S. Food and Drug Administration Center for Devices and Radiological Health [online]. FDA-approved lasers for LASIK. www.fda.gov/cdrh/LASIK/lasers.htm. Accessed January 20, 2007).

Hori-Komai et al.3 mentioned age under 18 years among the reasons for not performing refractive surgery. The professional literature includes few reports of surgery of patients younger than 18 years, and those studies were mostly of small numbers of youngsters with anisometropia in whom the procedure was usually performed in only 1 eye. Even though these reports indicate relatively good patient satisfaction, refractive surgery before the age of 18 years has not become a common practice because of expected progression of myopia.4–9 Although the Israeli army’s official policy is to discourage refractive surgery before recruitment because of the young age of the inductees, increasing numbers of youngsters prefer not needing to wear eyeglasses or contact lenses.

We conducted the current study mainly to determine whether refractive laser surgery presented an obstacle to serving in combat duties that involve functioning under conditions of darkness or low contrast, both potential handicaps for operated soldiers. Other possible limitations include extreme climatic conditions, such as dust and sun, which can exacerbate the side effects associated with refractive surgery, such as dry-eye symptoms and glare. Our findings show that most recruits who had refractive surgery and were assigned to combat units persevered in their units until the end of their compulsory military

Figure 1. Incidence of the ametropic recruits who had refractive surgery (by year and by sex).

Figure 2. Incidence of refractive surgery in male recruits 18 years or younger at the time of their prerecruitment medical examination (by year).

Figure 3. Percentage of male recruits using corrective eyewear or were post–refractive surgery who were fit for and assigned to combat units.
In addition, the dropout rate from combat units of soldiers who had refractive surgery (13.1%) was lower than that of those who wore spectacles and contact lenses (29.2%). As such, refractive surgery apparently does not impair the fitness of military combat personnel. This conclusion is supported by the United States’ Army War-Fighter Refractive Eye Surgery Program (WRESP) report. The WRESP was established by the U.S. Army Medical Command due to the potential readiness benefits of refractive surgery to the army. Although only 175 soldiers (more than 16,000 operated eyes) responded to the questionnaire, most said they felt their ability to contribute to their unit’s missions was enhanced. Their overall individual readiness was better and their weapons-sighting ability, ability to use personal nuclear–biological–chemical equipment, and ability to perform night operations improved. Subramanian et al. report that visual performance with night-vision goggles (post-PRK without optical correction) equaled or exceeded performance preoperatively, with best correction in active-duty U.S. Army Special Forces soldiers.

In conclusion, our 8-year study showed an increasing prevalence of refractive laser surgery in military service candidates for the IDF. The higher and increasing rate of recruits who had refractive surgery assigned to combat duty compared with corrective eyewear users assigned to the same units could suggest that these recruits are highly motivated to be accepted to combat units and that they have the operation to enhance their fitness profile. However, determining the specific reasons for the recruits’ desire to join elite groups or reasons for dropping out of them was beyond the scope of this study. Most recruits who had refractive surgery were men (male:female ratio 5:1), perhaps reflecting the importance they place on the benefits of the procedure in enhancing their combat-fitness profile. The rise in the percentage of recruits who had refractive surgery and who were assigned to combat units (25.0% in 1998 and 83.5% in 2005) compared with no change in the percentage of comparable corrective eyewear users who were assigned to these units during the study period may support this speculation. Finally, we showed that the perseverance in combat units of the operated soldiers was better than that of the corrective eyewear users and that refractive laser surgery did not present an obstacle to serving in combat duties.

REFERENCES

Figure 4. Percentage of dropouts from combat units: soldiers who had refractive surgery versus those using corrective eyewear by year. (Too few recruits had refractive surgery in 1998 to fit the graph.)