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Dissatisfaction with glasses

Insatisfação com as lentes corretoras oculares

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INTRODUCTION

Ophthalmologists' interest in patients' satisfaction with prescribed corrective lenses, as well as their concern with assessing patients' complaints and their reasons, play an essential role in improving the refractive technique and in the effectiveness of their clinical practice. [1-3]

Refractometry is the procedure mostly adopted in ophthalmic practice and, certainly, it has the strongest impact on visual acuity improvement. [1-3]

Refractometry learning process starts with theoretical and practical classes in specialization courses; however, this expertise is only enhanced throughout individuals' professional career. There is no guarantee that patients will be satisfied with their glasses even when the proper optical diopter is prescribed. It happens because variables involved in this process – such as patients' age, height, professional features, contrast sensitivity, corrective lens types, eyeglass frame shape, as well as likely mistakes in lens' manufacture process – go beyond the subjectivity of refractive tests. [1-3]

Thus, ophthalmologists' professional experience and, most of all, their analysis on patients' dissatisfaction with prescribed corrective lenses, are the factors enabling them to continuously improve their technique and sensitivity to refractometry.

Anamnesis enables ophthalmologists to better understand patients' visual habits in order to select the best correction method to be prescribed. Defining patients' daily visual request (i.e., whether their daily activities require better visual acuity to see things from a distance or up close), as well as their visual ergonomics' duration and type enable gathering important information used to define the best correction method in each case.

Copying refraction test results on patients' prescription is a common cause of error.

Analyzing the main causes of patients' dissatisfaction with prescription eyeglasses

Excessive presbyopia correction: Individuals with presbyopia, mainly the young ones, do not feel comfortable with reading glasses because they compromise their middle-distance vision. They complain that "their glasses are too strong" since they need to bring objects closer to get focus. It is customary prescribing the addition of near vision correction at the bottom of glass lenses based on a 30-cm distance between readers' eyes and a book. If glasses were only used to read books, that would be fine; however, nowadays, individuals' main short-distance activities comprise cell phones and computer screens, which lie approximately 40 cm away from individuals' eyes. Thus, either ophthalmologists explain the purpose of adding a 30-cm-distance focus to patients' glasses or they reduce such an addition - mainly in the case of young individuals who still have good focus versatility - or they prescribe occupational (regressive) lenses, which can focus both near and mid-distance images.

Height: One must calculate the distance patients prefer to position their reading material whenever corrective lenses are prescribed for book reading purposes. Overall, tall individuals, who have long arms, feel more comfortable when the book to be read is positioned at greater distances than the "conventional" 30-cm one.

Eyeglasses must be personalized for each patient, whose needs and features should be taken into consideration. If ophthalmologists do not take these issues into account, refractometry may be better performed in the future through devices capable of calculating objective refraction, testing subjective lenses and prescribing the best correction method based on personal information analyzed by artificial intelligence.

Professional features: The distance and dynamics of the desired short-vision focus of each patient must be taken into account, mainly in presbyopia cases:

- Computer: individuals' distance from the screen should be considered;
- Computer/book alternations: occupational lenses should be considered;
- Dentists: short-/very short-distance (patients' mouth) and middle-distance (instrument bench) focus should be considered. Occupational lenses may be eventually recommended;
- Musicians: position of the music score should be considered;
- Teachers: short- (blackboard) and long-distance (students) vision should be considered. Multifocal lenses may be

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eventually recommended;

- Drivers: multifocal lenses should be considered, although they can compromise lateral vision (side mirrors). Lenses manufactured exclusively for long-distance vision can limit drivers' view of the car's dashboard;
- Watchmakers: their working distance, which is overall closer than the conventional distance, should be defined.

Difficulties faced by patients using multifocal lenses at the time to use the computer: Prescribing progressive lenses for patients with presbyopia, whose computer monitor, which is positioned in line of sight parallel to the floor, requires chin-lift head movement to enable short-distance reading by using the bottom of the lens. In such cases, patients should be instructed to lower the height of the monitor by 10 to 15 cm so they can properly read in a more natural position, without forcing their cervical muscles. The indication of monofocal middle-distance lenses or occupational lenses should be taken into consideration whenever patients cannot change their workstation.

Major diopter change in comparison to previous corrective lenses: Although optical correction update can provide better vision than the previous correction method, changes greater than 1 diopter often "confuse patients' brain" and require some adaptation time, mainly among elderly individuals. Patients should be previously warned about this condition. Special attention should be given to astigmatism cases when it comes to changes in cylinder power and axis. Changes in cylinder axis should be avoided, mainly in elderly patients. In case of increased myopia, patients with presbyopia should be informed that their short-distance vision may worsen with the new lenses.

Low diopter and unnecessary lenses: Paying for eyeglasses that are not going to be used is also a reason for patients' dissatisfaction.

Anisometropia: Patients' tolerance to eyeglasses is relative; thus, they should test eyeglass frames in the medical office in order to estimate their degree of tolerance to this correction method. Pseudophakic patients overall tolerate greater diopter difference.

Ciliary muscle accommodation spasm: It is necessary paying special attention to young myopic individuals presenting frontal headache due to visual efforts. Static refractive examination may indicate hyperopia masked by accommodation spasm.

Hyperopia hypocorrected with multifocal lenses: In these cases, individuals tend to lift their chin to access the major correction available at the bottom of the lens. This condition can lead to vicious head position, as well as to pain in the cervical spine.

Hyperopia hypocorrection and myopia hypercorrection are common mistakes. Both cases require greater accommodative effort to enable short-distance vision and lead to asthenia.

Contrast sensitivity: Ophthalmologists should not believe that the visual acuity measured in the office based on the Snellen Table reflects the visual reality of patients' daily life. The Snellen Table with full contrast (black letters on a white background) does not have the same visual scale as the real world, which does not present full contrast. Thus, individuals presenting visual acuity of 20/20 in the medical office may find it hard to see a silver car in contrast to gray asphalt, or even to see a hole in the sidewalk at night. Thus, ophthalmologists should not question the veracity of eventual complaints that the prescribed eyeglasses, which provided visual acuity of 20/20 in the office, are not enough to meet patients' daily needs. The real-world vision has a different scale! This difficulty can be evidenced by visual acuity measurements based on Contrast Sensitivity Tables such as ETDRS, which is widely used in clinical research. In these cases, ophthalmologists should look for the likely organic causes of decreased visual contrast such as cataracts and corneal opacity.

Corrective lens types: Multifocal lenses tend to distort individuals' lateral vision and restrict the quality of their peripheral vision due to physical features. Multifocal glass users may have a hard time driving and climbing stairs, a fact that may lead to complaints if this condition is not previously explained to them.

Spherical aberration: Aspherical lenses are ideal for high diopters, mainly for hyperopia, since they minimize the spherical aberration of traditional lenses and of the cornea. The same reasoning is adopted for intraocular lenses (IOL), since aspherical lenses provide better distance visual acuity under low light conditions. It happens because pupil mydriasis enables the increased amount of light hitting the corneal periphery (region presenting greater spherical aberration) to enter the eye. The difference between these two lens types lies on the fact that the visual outcome of IOLs is often minimized because ophthalmologists do not take into consideration the real spherical aberration of each individual and, mainly, because IOLs with multiple aspherical values are not available for individualized correction. [4]

Nasopupillary distance: Eyeglass prescriptions must provide patients' nasopupillary distance (NPD) – both for distance and near vision – to enable measuring eye convergence. The manufacturing process of most progressive lenses adopts 2.5 mm convergence for both eyes. If this value meets patients' eye convergence value, they will be using proper lenses capable of matching their short-distance visual axes with the center of the short-distance vison area of the lenses. Otherwise, whenever eye convergence differences are greater, or lesser, than 2.5 mm, the short-distance visual axis does not pass through the center of the short-distance vision area of the lenses. Consequently, individuals use the sides of that area, which has poorer optical quality and leads to oscillations between sharp and slightly turbid images in their short-distance vision.

In these cases, ophthalmologists must add this difference to the short-distance vision NPD and instruct opticians that the cross marking the distance vision on the lens should not be positioned in front of the pupil. In fact, it should be mostly placed at temporal or nasal position depending on whether the eye convergence difference is greater, or lesser, than 2.5 mm.

It is important measuring eye convergence even in patients without presbyopia. Anisometropia cases require ophthalmologists to guide the assembly of monofocal lenses by placing the optical center in the short-distance vision NPD in order to increase patients' binocular comfort and to avoid anisophoria, which is mostly felt in short-distance vision.

Based on data defined in ophthalmologists' prescriptions, opticians can carry out their work, which consists in guiding the choice of the eyeglass frame and in taking anatomical measures that play a decisive role in users' good adaptation to eyeglasses. The third stage of their work comprises the production of lenses and their assembly in the eyeglass frame. The main issues often observed in these technical stages are:

Eyeglass frame shape: Opticians play an important role in guiding patients' choice for the eyeglass frame by evaluating the correct vertex distance and anatomical inclination.

Curved lenses, which are widely used in sport eyeglass frames, do not enable high diopter-astigmatism correction.

Some types of frames can limit the short-distance vision area of progressive lenses and cause discomfort to patients.

Excessive flexible frames can oscillate on their axis and change the quality of vision of monofocal lenses with cylinder

larger than 2D.

Lens manufacturing errors: Measuring patients' pupillary height is an important step in opticians' working process; this measurement is essential to enable the proper use of progressive lenses, which is the main cause of users' complaints.

Multifocal lenses have lower base prism at the bottom due to change in power. However, it is not a problem, as long as these prisms are balanced and present the same value in both eyes. In case of prismatic imbalance between the two eyes, patients using these lenses may complain about their short-distance vision due to early tiredness symptoms. Thus, if patients complain about their failure to adapt to progressive eyeglasses, if the degree of these lenses is in compliance with the prescription and if the assembly of the lenses is correct, it is necessary checking the induced prism

Symptoms and solutions guide

Symptoms	Likely solution
Limited near-vision zone	1.Height / NPD 2.Decreasing the vertex distance 3.Increasing the pantoscopic angle 4.Explanations about lens use
Undulation on the periphery	1. Decreasing the vertex distance 2. Increasing the facial curvature
Users lift their head or eyeglass frame to read	The mounted height is low: 1. Adjusting the platelets 2. Redoing the lenses
Users lower their head or eyeglass frame to read	The mounted height is high: 1. Adjusting the platelets 2. Redoing the lenses
Distance vision is a little blurry	Central vision - Increasing the pantoscopic angle - Lowering the height
Users move their heads sideways to focus well on VP	NPD is wrong: Checking monocular NPD Redoing the lenses

in both eyes. All manufacturers determine a symmetrical point in both eyes to enable this check. Complaints associated with upper base-induced prism comprise:

- The ground in front of individuals looks convex;
- Individuals feel like they are on a hill;
- Vertical objects look smaller than they are;
- Individuals feel like they are going down a mountain; and
- Lens thickness increases the size of images and the weight of the eyeglasses.

Lower base-induced prism complaints:

- The ground in front of individuals looks concave;
- Individuals feel like they are in a depression in the ground;
- Vertical objects look larger than they are; and
- Individuals feel like they are going up a mountain.

Ghost images: They may result from reflections on untreated glass lenses, mainly on the high-index ones. Light passing through the eyeglass lenses reflects on the front and rear surface of the lens, which results in duplicate or triplicate images. Coating the lens with magnesium fluoride may help solving the problem. Anti-reflective coating can also minimize ghost images and help patients who have visual issues when driving at night.

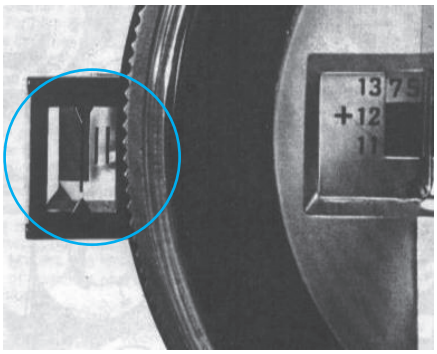

Figure 1: Vertex distance measurement

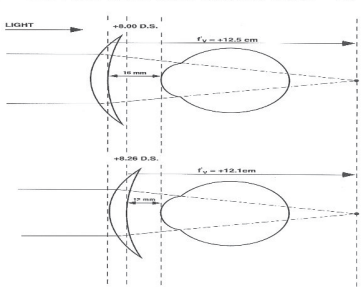

Figure 2: Example of change in diopter effect due to change in vertex distance

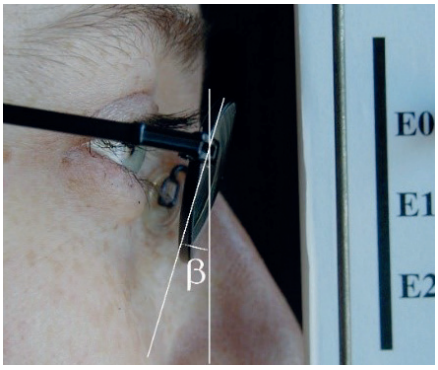

Figure 3: Pantoscopic angle or frame inclination; wherein β> 0° and < 15°.

Choosing the eyeglass frame: Several important parameters must be taken into account at the time to choose the eyeglass frame. Among them, one finds vertex distance and pantoscopic angle.

Vertex distance

It is the distance between the corneal apex and the posterior surface of the lens. It should be as small as possible to enable better using their field of vision by respecting patients' anatomy, mainly their eyelashes, which cannot touch the lens.

It ranges from 8 mm to 18 mm, on average, depending on patients' facial anatomy and on the selected eyeglass frame. The higher the ametropia, the more sensitive this parameter gets. Thus, in high ametropia cases, ophthalmologists must check in the refractor at what distance from the vertex the examination was performed and inform it in patients' prescription. (Figure 1)

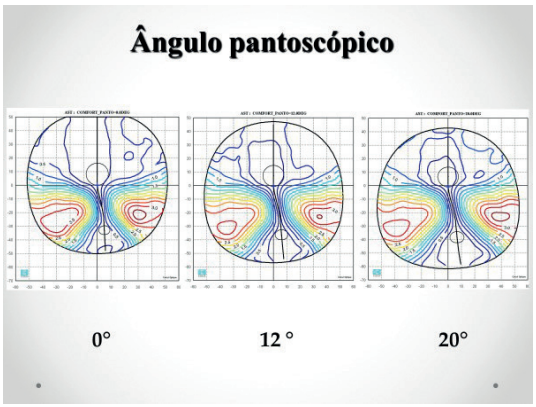

Figure 4: Near vision field amplitude in progressive lens with different inclinations. The near vision field has larger area with the highest inclination.

A 4-mm difference can generate a 0.26D change in a + 8.00D correction, as shown in Figure 2. This factor explains patients' habit to approach or remove their glasses to improve visual acuity. Examples: nearsighted individuals who "press" their glasses against their eyes, when their myopia increases, as well as hyperopic individuals who move their glasses away to compensate hyperopia increase.

This reasoning is also useful at the time to interpret patients' complaints about their glasses - whether they are new or have been used for some time -, since they may show hypo- or overcorrection of eye refraction.

Pantoscopic angle: Once the shortest apex distance possible for the patient is determined, the eyeglass frame should be adjusted with an inclination to allow patients' eyes to remain distant from the lens. This distance must be equivalent for both distance and near vision in order to enable the lower rotation movement of the eye globe to follow the posterior curve of the lens. (Figure 3).

Accordingly, the use of distance and near vision fields will be the best possible. Inclination-free eyeglass frames are a frequent source of complaints from patients using multifocal lenses (Figure 4).

How to deal with patients dissatisfied with their eyeglasses

- Listen more than speak!;
- Show interest and ability to solve problems;
- Analyze patients' complaints;
- Check the eyeglasses (degree, interpupillary distance and optical center height);
- Repeat the exam, starting with anamnesis, if necessary.

Communication with the optician

It is important to consider the optician as partner at the time to analyze and solve patients' complaints. In case of eyeglass assembly errors, notes about changes must be recorded in a new prescription. Writing on the eyeglass prescription itself can be considered an aggressive behavior. Communication can also take place by phone or electronic means.

Comments

The use of any ophthalmic lens changes the sharpness, distance (zooms in or out), size, color and shape of observed objects. In addition, it decreases the visual field and induces prismatic effects and/or optical aberrations. Positive lenses increase image size, whereas negative lenses decrease it. These visual changes trigger specific responses in different individuals, since human brain needs to adapt to the new images received and to binocular vision. It is a complex process that can be accepted right away or take some adaptation time. Thus, ophthalmologists should explain to patients that no optical solution, regardless of how good it can be, will be the same as the emmetropic human eye.

Refraction outcome and the resulting patients' satisfaction give the clinic a good reputation. A single dissatisfied patient communicates with 11 individuals, on average, whereas a single satisfied patient communicates with only four individuals. It is much easier and cheaper to maintain a patient than to get a new one.(5)

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