INFLUENCE OF NEAR OVERCORRECTION IN SUBJECTIVE SATISFACTION IN WEARERS OF PROGRESSIVE ADDITION LENSES

*Indizen Optical Technologies S.L., Spain

Corresponding author: Melissa S. Subero

INTRODUCTION

Conventional front-sided Progressive Power Lenses (PPLs) introduced oblique aberrations as wearers looked through areas of the lens that were away from the optical center. In particular, oblique aberrations at the near reference point (NRP) of the lens, an area that is quite relevant for presbyopic PPL wearers, resulted in unwanted cylinder and an effectively higher add than required by the wearers at that point.

The implementation of free-form technology in the lens manufacturing process, which allows point-by-point tailoring of the lenses, has enabled ophthalmic lens designers to develop PPLs by varying power distribution on the back surface of the lens to minimize oblique aberrations. Also, lens designers offer mathematical software permitting further improvement of PPL designs that are now personalized according to user position of wear parameters and frame dimensions.

Therefore, the use of an accurate lens manufacturing method and sophisticated software calculations help to improve the visual experience of PPL wearers in all gaze directions.

Vision ECP and/or lens manufacturers worry about the users complaining because of the actual “smaller” addition provided by the free-form PPL (Figure 2), especially if the user wore front-sided progressives before. This worry can be magnified after lens testing, as the lensometer reading for free-form PPLs is usually lower than that of front-sided PPL.

Because of this, addition over-preservation tends to be a common practice among ECPs, and some manufacturers offer increased addition as default. However, any unnecessary increase in addition compromises other lens properties, especially in intermediate vision.

PURPOSE

To compare the performance of personalized PPLs, with and without overcompensated addition to determine its effect in terms of wearer satisfaction.

MATERIALS AND METHODS

DESIGN

A prospective observational doubled masked study was performed on presbyopic subjects who were experienced PPL wearers.

STAGE I: FIRST IMPRESSIONS EVALUATION

Quantitative scores (scale from 0-10) of the general performance of each lens design were given by wearers the first time after they tested both lenses in some specific indoor and outdoor tasks.

STAGE II: ADAPTATION EVALUATION AND FINAL PREFERENCE

Best lens design in terms of adaptation was selected by wearers after 7 days of adaptation. Wearers also selected the best lens design for distance vision, mid range vision, close vision, comfort, electronic devices, less tiredness, and general performance.

STATISTICAL ANALYSIS

All statistical tests were performed using Statgraphics Centurion XVI.11 software with a significance level of p-value <0.05.

PROGRESSIVE LENSES

2 personalized PPLs with the same progressive design were tested (Figure 3): CL-Control had the prescribed near addition power as determined by the optician during the refraction, and OL-Overcorrected had an addition of 0.25 D higher.
RESULTS
The sample consisted of 30 (57.17 ± 5.19) presbyopic subjects PPLs experienced wearers. CL got better overall first impressions (p=0.02). Adaptation tended to be faster (p=0.08) with CL. Finally, 41% of wearers significantly preferred CL for far vision activities (p=0.02) and electronic devices usage (p= 0.04).

CONCLUSIONS
Addition over prescription is sometimes applied to personalized PPLs, so they provide a near-vision lensometer power closer to that of conventional PPLs. Results show no advantages in using an overcorrection on the addition and even more, lenses without overcorrection got statistically significant better first impressions and were preferred by wearers for far vision activities and electronic devices.