• Clinical Research •

Comparison of visual acuity and optical quality between higher-order aspheric monofocal and standard introcular lenses

Andrea Janekova[1,2,3], *Martina Polachova*[1], *David P. Piñero*[4], *Pavel Studeny*[1]

[1]Department of Ophthalmology, University Hospital Královské Vinohrady and 3rd Faculty of Medicine, Charles University, Prague 10034, Czech Republic
[2]Faculty of Medicine, Charles University Hradec Kralove, Hradec Kralove 50003, Czech Republic
[3]Eye Center Prague, Prague 17000, Czech Republic
[4]Department of Optics, Pharmacology and Anatomy, University of Alicante, Alicante 03690, Spain
Correspondence to: Andrea Janekova. Eye Center Prague, Jankovcova 1569/2c, Prague 17000, Czech Republic. janekovaandrea@gmail.com; David P. Piñero. Department of Optics, Pharmacology and Anatomy, University of Alicante, Crta San Vicente del Raspeig s/n 03690, San Vicente del Raspeig, Alicante 03690, Spain. david.pinyero@ua.es
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Abstract

● **AIM:** To compare the 12-month outcomes of visual performance and patient satisfaction of a higher-order aspheric monofocal intraocular lens (IOL) and a conventional monofocal IOL.

● **METHODS:** Prospective, randomized, comparative, double-blinded study including 22 patients who underwent bilateral cataract surgery with implantation of the Tecnis Eyhance ICB00 IOL in one eye (ICB00 group) and the Tecnis ZCB00 IOL in the fellow eye (ZCB00 group). Uncorrected distance (UDVA), corrected distance (CDVA), uncorrected intermediate (UIVA), distance-corrected intermediate (DCIVA), uncorrected near (UNVA), and distance-corrected near visual acuities (DCNVA) were evaluated during a 12-month follow-up. Contrast sensitivity, defocus curves, and reading text size were also evaluated. Patient satisfaction was assessed with a questionnaire at the 6-month postoperative visit.

● **RESULTS:** Mean postoperative logMAR UDVA was 0.01±0.12 and -0.02±0.10 in ICB00 and ZCB00 groups, respectively (*P*=0.37). Mean logMAR UIVA was 0.32±0.19 and 0.45±0.16 in ICB00 and ZCB00 groups, respectively (*P*=0.010). Differences between groups in UNVA did not reach statistical significance (*P*=0.16). The intermediate reading acuity at 66 cm (*P*=0.02) and 80 cm (*P*=0.04) was significantly better in the ICB00 group. Postoperative contrast sensitivity results did not differ significantly between groups (*P*>0.05). Patients reported high overall satisfaction, with 62% of patients using spectacles for reading in everyday life.

● **CONCLUSION:** The eyes of patients implanted with the enhanced monofocal IOL evaluated have significantly better visual acuity for intermediate distances with the same contrast sensitivity as a conventional monofocal IOL.

● **KEYWORDS:** enhanced monofocal intraocular lens; Tecnis Eyhance; contrast sensitivity; intermediate visual acuity

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INTRODUCTION

The intermediate working distance required for computer work and the use of smartphones has increased patient's requirements for clearly seeing at more distances[1]. Despite the availability of in-market premium lenses (trifocal, multifocal, and panfocal lenses), which are currently standard options for patients who are expected to be completely spectacle-independent, there are patients who do not meet the indication criteria for premium lenses[2]. Many patients are not candidates for reasons including dry eye, previous refractive surgery, maculopathy, or optic nerve neuropathy[2]. Improved optics and modern diffractive trifocal lenses are associated with a loss of contrast sensitivity and photopic phenomena, such as glare and halos. Visual disturbances have been highlighted as a key cause of dissatisfaction in patients implanted with multifocal intraocular lenses (IOLs)[3-4]. Efforts to reduce the unwanted effects of multifocal IOLs have led to implant these IOLs when the patient could benefit from better intermediate visual acuity and functional social reading without experiencing these side effects.

The extended depth-of-focus (EDOF) IOL is an emerging technology designed to improve intermediate visual acuity and cause less severe visual disturbance and better contrast sensitivity than trifocal IOLs[5-7]. Improved intermediate vision, optical disturbance, and the degree of contrast sensitivity depends on the specific design of the EDOF IOL[8]. Monofocal lenses, which are standard in cataract surgery and provide maximum visual quality at distance, do not allow patients to focus on intermediate and near distances. Although monovision correction is possible, there could be some loss of stereopsis and not all patients tolerate the difference in vision between both eyes[9]. To overcome this barrier between EDOF and monofocal technology, there is growing interest in new technology that can enhance intermediate distance with the same no-occurrence of photic phenomena and contrast sensitivity as a monofocal lens. The aim of this study was to compare the clinical outcomes of a higher-order aspheric enhanced monofocal IOL with those obtained with a standard monofocal lens.

PARTICIPANTS AND METHODS

Ethical Approval This prospective, bilateral, randomized, comparative, evaluator-masked, post-marketing study was conducted at the Department of Ophthalmology, University Hospital Královské Vinohrady and 3rd Faculty of Medicine, Charles University, Prague, Czech Republic (ClincialTrials.gov. identifier NCT04800887). All patients provided written informed consent to participate in the study, local independent ethics committee approval was obtained (Charles University, Ethic Committee of Faculty Hospital of Kralovske Vinohrady, ethics number: EK-VP/64/0/2019), and all aspects of the Declaration of Helsinki were strictly followed.

The study included patients scheduled for bilateral cataract surgery with implantation of a monofocal IOL in one eye (Tecnis ZCB00, Johnson & Johnson Vision Care, Inc., USA) and a higher-order aspheric lens enhanced monofocal IOL (Tecnis ICB00, Johnson & Johnson Vision Care, Inc., USA) in the fellow eye. Patients were examined at 3, 6, and 12mo postoperatively. Patients were randomly assigned to receive a monofocal IOL in one eye and a higher-order aspheric enhanced monofocal IOL in the fellow eye.

Inclusion and Exclusion Criteria Patients were included in the study if they were 40–85 years old, had corneal astigmatism up to 0.75 diopter (D; measured by optical biometry), the calculated lens was between 18.0 and 27.0 dioptric power and the difference in power of the lenses calculated between fellow eyes were within 1.5 D to ensure that both eyes in each subject had similar refractions and axial lengths. Exclusion criteria were corneal opacities or irregularities, amblyopia, anisometropia, glaucoma, previous corneal refractive surgery, and other coexisting ocular pathologies that could affect postoperative visual acuity.

Patient Evaluation Before surgery, all patients underwent an ophthalmological examination including measurement of intraocular pressure and monocular uncorrected (UDVA) and corrected (CDVA) distance visual acuity, anterior and posterior segment slit lamp examination (Haag-Streit, Germany), biometry and dilated fundus examination. Likewise, ocular dominance was determined using the hole-in-the-card dominance test (Dolman test). For ocular biometric measurements, an optical biometer (IOL Master 500, Carl Zeiss Meditec, Germany) was used. Emmetropia was targeted for all eyes in the study using the SRKT/T formula for IOL power calculation, with no monovision target in any case.

After surgery, patients were evaluated at 3, 6, and 12mo postoperatively. The following measurements were taken monocularly under photopic conditions (85 cd/m^2): UDVA, CDVA, uncorrected intermediate visual acuity (UIVA), distance-corrected visual acuity (DCIVA), uncorrected near visual acuity (UNVA), distance-corrected near visual acuity (DCNVA), and corrected near visual acuity (CNVA). Distance visual acuities were measured at 4 m using an Early Treatment Diabetic Retinopathy Study (ETDRS) illumination cabinet (Precision Vision). Intermediate (66 cm) and near (40 cm) visual acuities were measured using printed ETDRS charts. To avoid letter-set memorization, different charts were presented to each patient during the follow-up visits. At the 1-year follow-up, we measured the size of the reading text at the Salzburg reading desk monocularly for 66 cm and 80 cm. This device allows standardization of screen illumination, contrast, and monitoring of reading distance[10]. A microphone tracks the sound waves and allows the software to calculate reading speed in words per minute (wpm) and reading acuity in logarithm of the minimum angle of resolution (logMAR)[11]. In healthy eyes, a reading speed above or equal to the threshold of 80 wpm was accepted. Besides all these measures, monocular defocus curve was obtained at 6mo postoperatively by using the best corrected distance correction and then defocusing the image in 0.5 D increments from +1.5 to -2.5 D with spherical plus and spherical minus trial lenses. Contrast sensitivity was also measured monocularly at 6mo and 1y under photopic and mesopic (3 cd/m^2) conditions with a CSV-1000 (Vector Vision Inc., USA) device without glare [3, 6, 12, and 18 cycles per degree (cpd)]. Finally, at the 6-month visit, patients were asked about their subjective perception of photic phenomena and spectacle independence using a questionnaire based on the Catquest-9SF (9-item short-form) questionnaire with added special questions regarding the difference in vision in each eye for various distances[12]. As all patients were implanted with the enhanced monofocal IOL in one eye and the conventional monofocal in the other one, the questionnaire was focused on identifying any difference in quality of vision between fellow

eyes. The questionnaire further contained questions for self-assessing at various distances the level of difficulty for doing some vision-related activities without glasses and the level of satisfaction with the vision achieved using a scale going from 1 to 4 (1=Yes, very great difficulty=very dissatisfied, 4=No, no difficulty=very satisfied, and Cannot decide answer)[12]. Before completing the questionnaire, the investigator explained the questions to the patients, and then the patients were left alone to complete the questionnaire.

The primary endpoint of the trial was to compare monocular UIVA and monocular DCIVA in both groups.

IOLs Description The monofocal IOL Tecnis ZCB00 is a 1-piece hydrophobic acrylic lens with an optic diameter of 6.0 mm. The overall length of the lens was 13 mm, with an aspheric anterior surface to compensate for spherical aberration of the average cornea. The higher-order aspheric lens Tecnis Eyhance ICB00 is made of the same hydrophobic acrylic material with the same dimensions. The anterior aspheric surface of the optic was modified to create a continuous power profile (power increasing from the periphery to the center of the lens), resulting in improved vision for intermediate tasks. This difference in thickness in the optical center enables a power increase in the lens[13-14].

Surgical Procedure Bilateral clear corneal sutureless phacoemulsification and IOL implantation were performed by an experienced surgeon using the same technique in both eyes. All patients underwent immediately sequential bilateral cataract surgery. The surgical process involved topical anesthesia, superior 3-step clear corneal incision (2.2 mm), 5.0-mm curvilinear capsulorhexis, phacoemulsification, bilateral irrigation-aspiration, and IOL implantation. At the end of the surgery, intracameral cefuroxime was injected into the anterior chamber. Paracentesis wounds were closed with a balanced salt solution for watertightness. All patients received the same postoperative treatment, which was a combination of topical anti-inflammatory prophylaxis using 1-mg nepafenac drops for 3wk and antibiotic prophylaxis using 0.3% tobramycin drops for 1wk.

In all cases, IOL power calculations were performed using the Barrett Universal II formula, being the target, the first lens providing a slight negative refractive error. Monovision with induction of residual myopia of more than 0.50 D was not targeted in any case. The IOL to implant in each eye of each patient was assigned randomly according to a random number sequence.

Statistical Analysis STATISTICA software (version 12.7; Dell Software Inc., USA) was used to analyze the data and generate box plots. The Shapiro-Wilk test was used to test the normality of the data samples. When parametric analysis was possible, a paired *t*-test was used to detect significant differences. When parametric tests were not possible, data parameters were tested using the non-parametric Mann-Whitney *U* test. Difference in visual acuity over time was tested using the non-parametric Friedman test. Differences were considered statistically significant for $P<0.05$.

Sample size was estimated using the online statistical power calculator GRANMO version 7.04 (https://www.imim.cat/media/upload/arxius/granmo/granmo_v704.html). For this calculation, the minimum difference to detect was considered as 0.10 logMAR (1 line) in DCIVA, with a common standard deviation of 0.15 logMAR, an alpha risk of 0.05, a beta risk 0.25, a drop-out rate of 10%, and considering the performance of two-sided comparisons, This led us a sample size of 20 that was increased to 22 for safety.

RESULTS

A total of 44 eyes from 22 patients were included in this study. Every patient was implanted with a monofocal lens (ZCB00) in one eye and a higher-order aspheric lens (ICB00) in the fellow eye. Preoperative characteristics of the patients' eyes were reported in Table 1. All surgical procedures were uneventful. In both eyes of one patient, mild cystoid macular edema was diagnosed at the 1-month postoperative visit and had been completely resolved by the 6-month visit. The patient was treated with topical anti-inflammatory drugs for 1mo. At 12mo postoperatively, no clinically significant posterior capsular opacification was detected in any patient. All patients finished the 12-month follow-up visit.

Visual Acuity Outcomes Table 2 showed the 12-month postoperative visual outcomes in both groups. The mean postoperative spherical equivalent (SE) was -0.06±0.46 D in the ICB00 group and -0.02±0.35 D in the ZCB00 group ($P=0.75$). A total of 82% and 95% of eyes in the ICB00 and ZCB00 groups, respectively, were had a SE within ±0.5 D. Both groups reached high levels of UDVA and CDVA, with no significant differences between them ($P=0.37$ and $P=0.08$). Mean monocular UIVA was 0.32 logMAR in the ICB00 group and 0.45 logMAR in the ZCB00 group, and mean DCIVA was 0.35 logMAR in the ICB00 group and 0.46 in the ZCB00 group. Both intermediate visual acuities were significantly better in the ICB00 group ($P=0.01$ and $P=0.01$). Mean UNVA was 0.56 and 0.65 in the ICB00 and ZCB00 groups, respectively ($P=0.16$) and mean DCNVA was very similar in both groups ($P=0.8$). CNVA did not differ significantly between groups either ($P=0.78$). Figure 1 showed the distribution of postoperative DCIVA and UIVA in both groups at 3, 6, and 12-month after surgery. No significant differences were found between the follow-up periods ($P>0.05$).

Contrast Sensitivity Outcomes Monocular distance-corrected contrast sensitivity results under mesopic and photopic light conditions were presented in Figure 2. Mean

Table 1 Preoperative characteristic of eyes of patients in two IOL groups mean±SD, median (range)

Characteristics	Eyhance ICB00	ZCB00	*P*
Age (y)	70.4±5.0, 70 (62, 82)	70.4±5.0, 70 (62, 82)	0.99
Planned refractive target (D)	-0.08±0.1, -0.14 (-0.23, 0.07)	-0.06±0.1, -0.05 (-0.25, 0.08)	0.33
IOL power (D)	22.7±1.98, 22.5 (18.5, 26.5)	22.7±1.9, 22.8 (19.0, 25.5)	0.94
Preoperative monocular UDVA	0.42±0.28, 0.3 (0.05, 1.0)	0.5±0.38, 0.4 (0.05, 1.0)	0.52
Preoperative monocular CDVA	0.17±0,15, 0.1 (0.05, 0.7)	0.1±0.08, 0.1 (0, 0.4)	0.28
Preoperative SE (D)	0.62±1.69, 1.68 (-2.5, 3.25)	0.74±1.78, 1.1 (-3.0, 3.75)	0.82
Axial length (mm)	23.23±0.79, 23.11 (22.06, 24.96)	23.2±0.76, 23.26 (22.08, 24.65)	0.89

SD: Standard deviation; D: Diopter; UDVA: Uncorrected distance visual acuity; CDVA: Corrected distance visual acuity; SE: Spherical equivalent; IOL: Intraocular lens.

Table 2 Twelve-months postoperative visual outcomes mean±SD, median (range)

Items	Eyhance ICB00	ZCB00	*P*
Monocular UDVA	0.01±0.12, 0.0 (-0.1, 0.4)	-0.02±0.1, 0.0 (-0.2, 0.1)	0.37
Monocular CDVA	-0.08±0.08, -0.08 (-0.2, 0.1)	-0.13±0.09, -0.2 (-0.2, 0.1)	0.08
Monocular UIVA	0.32±0.19, 0.3 (0.05, 0.6)	0.45±0.16, 0.4 (0.2, 0.7)	0.01[a]
Monocular DCIVA	0.35±0.15, 0.3 (0.1, 0.6)	0.46±0.13, 0.5 (0.2, 0.6)	0.01[a]
Monocular UNVA	0.56±0.2, 0.5 (0.3, 0.8)	0.65 ±0.22, 0.7 (0.3, 0.8)	0.16
Monocular DCNVA	0.62 ±0.19, 0.7 (0.3, 0.8)	0.64±0.16, 0.7 (0.3, 0.8)	0.8
Monocular CNVA	0.02 ±0.06, 0.0 (0.0, 0.2)	0.03±0.05, 0.0 (0.0, 0.1)	0.78
SE (D)	-0.06±0.46, 0.0 (-0.75, 1.25)	-0.02±0.35, 0.0 (-0.63, 0.75)	0.75

UDVA: Uncorrected distance visual acuity; CDVA: Corrected distance visual acuity; UIVA: Uncorrected intermediate visual acuity; DCIVA: Distance-corrected intermediate visual acuity; UNVA: Uncorrected near visual acuity; DCNVA: Distance-corrected near visual acuity; CNVA: Corrected near visual acuity; SE: Spherical equivalent. [a]*P*<0.05 between groups.

Table 3 Intermediate reading performance at Salzburg reading desk mean±SD, median (range)

Parameters	66 cm		*P*	80 cm		*P*
	Eyhance ICB00	ZCB00		Eyhance ICB00	ZCB00	
Reading acuity (logMAR)	0.39±0.14, 0.35 (0.15, 0.5)	0.48±0.12, 0.47 (0.25, 0.7)	0.02[a]	0.27±0.13, 0.24 (0.01, 0.5)	0.38±0.16, 0.47 (0.15, 0.7)	0.04[a]
Reading speed (wpm)	102, 92 (96, 143)	108, 103 (85, 150)	0.33	100, 96 (80, 150)	105, 106 (80, 150)	0.34

logMAR: Logarithm of the minimum angle of resolution; wpm: Words per minute. [a]*P*<0.05 between groups.

values for contrast sensitivity were similar between both groups and did not differ significantly (*P*>0.05 at all spatial frequencies).

Defocus Curve Figure 3 showed monocular defocus curves of both groups at the 12-month follow-up. Both groups exhibited a reduction in visual acuity with increased negative sphere. The ICB00 group achieved a slightly better continuous range of vision from -1.0 to -2.5 D. The difference was borderline statistically significant (*P*=0.05 at -1.0 D, *P*=0.06 at -1.5 D, *P*=0.05 at -2.0 D and *P*=0.07 at -2.5 D).

Intermediate Reading Performance The logMAR reading acuity at 80 cm was better in the ICB00 group (0.27±0.13 ICB00 group *vs* 0.38±0.16 ZCB00 group, *P*=0.04). At 66 cm, eyes in the ICB00 group also achieved significantly better VA (0.39±0.14 ICB00 group *vs* 0.48±0.12 ZCB00 group, *P*=0.02; Table 3).

Patient-reported Outcomes As all study patients were implanted with both types of tested lenses, the questionnaire is based on evaluating visual acuity of both eyes together in everyday life, and therefore no comparison between groups was performed. All patients were satisfied with their visual acuity in everyday life, vision for television, and reading on a car dashboard. For intermediate tasks, such as working on a computer and using a tablet, 87% of patients were satisfied (very satisfied or satisfied). With daily reading, 54% of patients were satisfied and 46% dissatisfied without glasses. Of the patients, 62% used spectacles for reading all the time and 14% very often; however, 24% of patients used glasses rarely or never. One patient (less than 5%) reported feeling differences between eyes in everyday activities for intermediate or near distances. No patients reported perceiving optical phenomena.

DISCUSSION

Correction of presbyopia at the time of cataract surgery is frequently requested by patients. Modern premium lenses (trifocal, multifocal, panfocal) can provide good visual acuity at more varied distances than that provided by conventional monofocal lenses[15-16]. While trifocal and other multifocal IOLs can provide a successful far, intermediate, and near

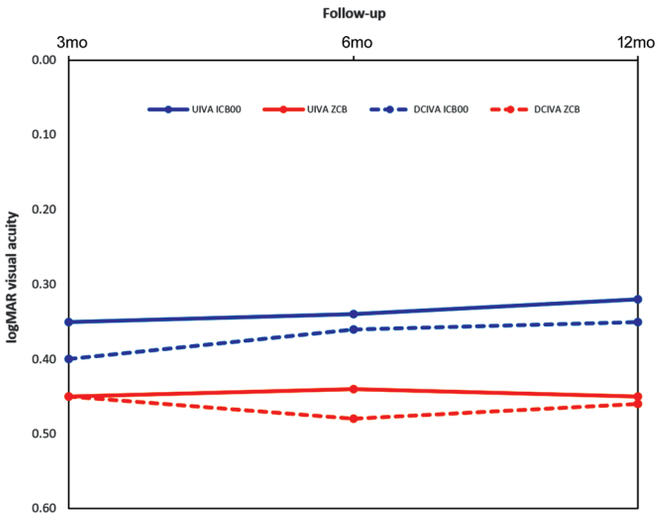

Figure 1 Uncorrected and distance corrected intermediate visual acuity in 3, 6, and 12mo in the two groups evaluated in the study UIVA: Uncorrected intermediate visual acuity; DCIVA: Distance-corrected intermediate visual acuity; logMAR: Logarithm of the minimum angle of resolution.

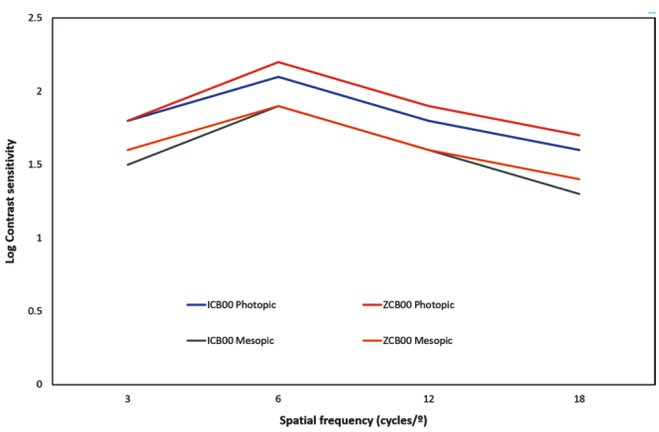

Figure 2 Photopic and mesopic contrast sensitivity functions in the two groups evaluated in the study logCS*:* Logarithmic contrast sensitivity*;* cpd: Cycles per degree.

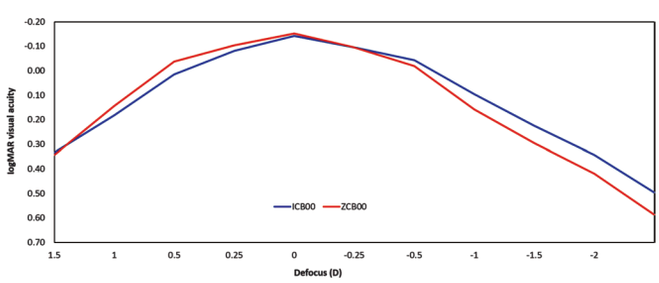

Figure 3 Mean defocus curve in the two groups evaluated in the study logMAR: Logarithm of the minimum angle of resolution.

vision outcome, contrast sensitivity is reduced because of light distribution, with the possibility of increased perception of photic phenomena[17]. With intermediate distance vision gaining importance in everyday life, the need for IOLs extending the depth of focus is growing. For this reason, EDOF IOLs were developed which are based on different technologies and can provide different levels of visual rehabilitation[6]. However, EDOF IOLs can also cause photic phenomena, although normally they are produced at a lower level than those caused by multifocal IOLs[18-20]. As no all patients can afford premium IOLs or are candidates for this type of lens due to co-existing ocular pathologies, new IOL optical designs have been developed to improve intermediate distance vision with no perception of optical phenomena[6]. In this study, an evaluation of the clinical and patient-reported outcomes of one of these enhanced monofocal IOLs, the Tecnis Eyhance, has been performed. The main advantage of this work compared to previous ones is that the comparison of the enhanced monofocal IOL with the conventional monofocal IOL was always performed within the same patient. Using these intra-individual comparisons highly reduces any potential selection bias.

In this study, the safety and efficacy of the distance visual rehabilitation of the higher-order aspheric enhanced monofocal IOL Tecnis Eyhance have been demonstrated, being equivalent to those values obtained with the conventional monofocal IOL. UDVA and CDVA did not differ significantly between the groups in the current study. Specifically, UDVA of 0.1 logMAR or better was found in 92% and 97% of eyes in the ICB00 and ZCB00 groups, respectively. Postoperative CDVA was 0.1 logMAR or better in all eyes studied. There was slightly higher variability in the postoperative SE in the ICB00 group, although differences between groups did not reach statistical significance. This variability in the refractive outcome has been previously reported by other authors[20-21] and could be due to the modified anterior surface of the IOL that increases the depth of focus and then the possibility of finding different points of refractive error associated to the same level of visual acuity. This aspect should be considered when performing postoperative manifest refraction. Concerning the distance visual acuity outcomes of the enhanced monofocal IOL, they were like those reported in other studies[20-22].

Monocular UIVA was significantly better in the ICB00 group in the current study, as well as in previously published studies comparing the same IOL with different conventional monofocal IOLs[14,20-38]. The distance considered in our study as intermediate vision was 66 cm, according to international recommendations[39]. Mean logMAR UIVA of 0.32±0.19 was found in our series, which is consistent with the results obtained in previous series[23,34-36]. Some studies reported monocular UIVA slightly better than those found in the current study[34,37], but these differences may be attributed to differences in the clinical tests used, the sample of patients evaluated or the level of postoperative residual refraction. Similar to our results, studies comparing monocular intermediate visual acuity outcomes between ICB00 and ZCB00 IOLs found that the values achieved by the ICB00 group were significantly

better than those of the ZCB00 group[20-21,27,29,31-34,36-37]. This confirms that the enhanced monofocal IOL evaluated provides a better intermediate visual function than a conventional monofocal IOL. Regarding near vision, a slight but non-significant difference in monocular UNVA between groups was found, which is equivalent to the findings from other authors[21,26-27,29,31,33,37]. Binocular visual acuities were not measured in the current study. As there is a known binocular summation effect, patients could experience better UNVA values, but the results are more variable among individuals[40].

The photopic contrast sensitivity of the ICB00 group was like that of the ZCB00 group. Menccuci *et al*[20] found similar photopic contrast sensitivity when comparing ICB00 and ZCB00 IOLs, with slightly higher values for the enhanced monofocal IOL for the highest spatial frequencies evaluated. Pedrotti *et al*[19] found similar contrast sensitivity between the ZCB00 and ICB00 IOLs for all tested spatial frequencies, as in our series. Mesopic contrast sensitivity was also similar in both groups. As the ICB00 is a refractive IOL, it does not produce a reduction of contrast sensitivity as could happen with diffractive-based EDOF lenses[41]. As photopic contrast sensitivity could be the same in eyes implanted with IOLs with different optical designs, it should be considered that the mesopic contrast sensitivity may be considered as a better indicator of differences among IOLs. Mencucci *et al*[42] compared trifocal and EDOF lenses and found that contrast sensitivity was similar under photopic conditions but lower in the trifocal group under mesopic conditions. In the current study, both groups contained eyes from the same patients; therefore, the results were very consistent as the compared eyes did not vary between groups. A more powerful outcome is that contrast sensitivity measurement was taken twice in both groups, at 6mo and one year, with no significant differences between 6 and 12-month visits. All these outcomes confirm that the higher-order aspheric IOL evaluated is a monofocal lens with improved intermediate vision providing the same contrast sensitivity as a monofocal lens.

The intermediate reading performance was also tested in the current study on an electronic reading desk. The intermediate reading speed of patients with other types of IOLs has been previously evaluated and published[10-11]. To our knowledge, there is no other randomized control study of the ICB00 lens evaluating the reading speed for comparison. For both testing distances (66 and 80 cm), the ICB00 group achieved significantly better logMAR reading acuity than the group of eyes implanted with the conventional monofocal IOL. However, no significant differences were found in terms of reading speed among IOL groups. It should be considered than the reading speed was measured according to the reading acuity. In other words, the letter size was adjusted to the visual capability of the patient and therefore it is coherent that the reading speed was similar as it is supposed that all patient included had equivalent cognitive abilities for performing an efficient reading process.

This study has some limitation that should be acknowledged. First, the sample size was high enough to detect significant differences among groups in DCIVA, but it was possibly insufficient to detect significant changes in other variables. For this reason, future studies with larger samples sizes should be performed to detect significant changes in other variables, such as patient-reported outcomes, that are normally associated to larger variability. Second, no objective or subjective evaluation of photic phenomena was performed, and this should be considered in future trials. Finally, no comparison with presbyopia-correcting IOLs was performed and this could be an interesting aspect to consider for future trials.

In conclusion, our results are comparable to previously published results and confirms that the Eyhance ICB00 IOL provides very good distance vision and optical quality as a monofocal lens and offers superior intermediate vision with the same contrast sensitivity and no occurrence of optical phenomena. The Eyhance lens is a good and cost-effective choice for patients undergoing ocular surgery.

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