Comparison of OKULIX ray-tracing software with SRK-T and Hoffer-Q formula in intraocular lens power calculation

Ahmadreza Khalilian[a], Mohammad Ghoreyshi[a], Mohammadreza Peyman[b], Mohaddeseh Mohammadinia[c], Alireza Peyman[a]
[a]Isfahan University of Medical Sciences, Isfahan, Iran
[b]University Malaya, Kuala Lumpur, Malaysia
[c]Parsian Vision Research Institute, Isfahan, Iran

Purpose: To compare the performance of OKULIX ray-tracing software with SRK-T and Hoffer Q formula in Intra Ocular Lens (IOL) power calculation in patients presenting with cataract.

Methods: In this prospective study, 104 eyes of 104 patients with cataract who underwent phacoemulsification and IOL implantation were recruited. Three IOL brands were used and for all eyes, IOL power calculation was performed using SRK-T, Hoffer Q formula and also OKULIX ray-tracing software. For all patients, axial length and keratometry data was obtained with IOLMaster 500 device and IOL power was determined using Hoffer Q and SRK-T formula. The IOL powers were also calculated using the OKULIX ray-tracing software combined with CASIA ASOCT and IOLMaster 500 device. Optically measured axial length of eyes were inserted to OKULIX software from IOLMaster 500 device, and anterior and posterior tomographic and corneal pachymetry data was imported from CASIA AS-OCT into the OKULIX.

The performance of each calculation methods was measured by subtracting the predicted postoperative refraction from the postoperative Manifest Refraction Spherical Equivalent (MRSE). For each of the 3 methods, the mean absolute prediction error was determined, too.

Results: The mean value absolute prediction error by OKULIX, SRK-T and Hoffer Q formulas, respectively, were 0.42 (±0.03), 0.36 (±0.02) and 0.37 (±0.02). The mean absolute prediction error by OKULIX had no significant difference between three IOL groups (P ¼ 0.96), and it was confirmed that there was no meaningful statistically difference in mean absolute prediction error between the OKULIX, SRK-T and Hoffer Q formula. (P ¼ 0.25). Also in each group of implanted IOLs, all three formulas worked with the same accuracy. The prediction error using

OKULIX were within ±0.50 diopter in 63.5% of eyes and within ±1.00 diopter in 94.2% of eyes.

Conclusion: OKULIX ray-tracing IOL power measurements provides reliable and satisfactory postoperative results, which are comparable to other 3rd generation formulas of SRK-T and Hoffer Q.

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Biography

Ahmadreza Khalilian Isfahan University of Medical Sciences also known as Medical University of Isfahan is a university specializing in basic medical sciences, clinical science, and health services, located in Isfahan, Iran. Isfahan University of Medical Sciences is one of the Iranian medical schools.