Biometric measurements in highly myopic eyes

Purpose
To assess the repeatability and accuracy of optical biometry (Lenstar LS900 optical low-coherence reflectometry [OLCR] and IOLMaster partial coherence interferometry [PCI]) and applanation ultrasound biometry in highly myopic eyes.

Setting
Division of Preventive Ophthalmology, Zhongshan Ophthalmic Center, Guangzhou, China.

Design
Comparative evaluation of diagnostic technology.

Methods
Biometric measurements were taken in highly myopic subjects with a spherical equivalent (SE) of −6.00 diopters (D) or higher and an axial length (AL) longer than 25.0 mm. Measurements of AL and anterior chamber depth (ACD) obtained by OLCR were compared with those obtained by PCI and applanation A-scan ultrasound. Right eyes were analyzed. Repeatability was evaluated using the coefficient of variation (CoV) and agreement, using Bland-Altman analyses.

Results
The mean SE was −11.20 D ± 4.65 (SD). The CoVs for repeated AL measurements using OLCR, PCI, and applanation ultrasound were 0.06%, 0.07%, and 0.20%, respectively. The limits of agreement (LoA) for AL were 0.11 mm between OLCR and PCI, 1.01 mm between OLCR and applanation ultrasound, and 1.03 mm between PCI and ultrasound. The ACD values were 0.29 mm, 0.53 mm, and 0.51 mm, respectively. These repeatability and agreement results were comparable in eyes with extreme myopia (AL ≥27.0 mm) or posterior staphyloma. The mean radius of corneal curvature was similar between OLCR and PCI (7.66 ± 0.24 mm versus 7.64 ± 0.25 mm), with an LoA of 0.12 mm.

Conclusion
Optical biometry provided more repeatable and precise measurements of biometric parameters, including AL and ACD, than applanation ultrasound biometry in highly myopic eyes.

Financial Disclosure
No author has a financial or proprietary interest in any material or method mentioned.