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Corneal higher-order aberrations in infectious keratitis

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Abstract

Purpose: To characterize the corneal higher-order aberrations (HOAs) in eyes with acanthoamoeba keratitis (AK), bacterial keratitis (BK), and fungal keratitis (FK).
Design: Retrospective consecutive case series.
Methods: This retrospective study includes 18 normal subjects and 63 eyes of 62 consecutive patients with corneal scarring due to AK (20 eyes), BK (35 eyes) and FK (8 eyes) from 2010 to 2016. HOAs of the anterior and posterior surfaces and the total cornea were analyzed by anterior segment optical coherence tomography (AS-OCT). Corneal HOA patterns were assigned on the basis of corneal topography maps. Corneal opacity grading was assigned on the basis of slit-lamp examinations. We evaluated corneal HOAs, corneal opacity grading, and their correlation with visual acuity
Results: HOAs of the total cornea within a 4-mm diameter were significantly larger in eyes with infectious keratitis (AK, 1.15 ± 2.06 μm; BK, 0.91 ± 0.88 μm; FK, 1.39 ± 1.46 μm) compared with normal controls (0.09 ± 0.01 μm, all, $P < 0.001$). Asymmetric pattern was the most common topographic pattern (30% in AK, 51.4% in BK and 37.5% in FK), followed by the protrusion patterns (10% in AK, 20% in BK and 12.5% in FK). The visual acuity significantly correlated with HOAs (anterior surface: $R = 0.764$, $P < 0.0001$; posterior surface: $R = 0.745$, $P < 0.0001$; total cornea: $R = 0.669$, $P < 0.0001$).
Conclusions: Larger corneal HOAs in patients with infectious keratitis were associated with poorer visual acuity values. Asymmetric pattern was the most common topographic pattern in infectious keratitis.