CL23 - VALIDATION OF TOMOGRAPHY AND BIOMECHANICAL INDEX FOR ENHANCING ECTASIA DETECTION

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Purpose: To validate the Tomographic and Biomechanical Index (TBI), which combines Scheimpflug-based corneal tomography and biomechanics, for enhancing ectasia detection.

Methods: A group of patients, different from the original study of TBI presentation, were retrospectively studied. The normal group included 1 eye randomly selected from 318 patients with normal corneas; the keratoconus group included 1 eye randomly selected from 102 patients with keratoconus; and two groups of a same patients, one with a eye with very asymmetric ectasia (127 eyes, VAE-E group), and the other one with normal topography (127 eyes VAE-NT group). The accuracies for detecting ectasia of TBI were compared to other indexes as the Belin/Ambrósio Deviation (BAD-D), as to other not published yet index as Pentacam Random Forest Index (PRFI) and Black River Index (BRI), considering the areas under receiver operating characteristic curves (AUROCs).

Results: The AUROC of the TBI in the VAE-NT group was 0.972, which was statistically higher (DeLong et al., P < .001) than the BAD-D (0.922), the PRFI (0.953) and BRI (0.869). The TBI cut-off value of 0.6 provided 99.0% sensitivity for detecting clinical ectasia (keratoconus, VAE-E and VAE-NT groups) with 99.4% specificity. An optimized TBI cut-off value of 0.21 provided 91.4% sensitivity with 91.2% specificity in the VAE-NT group.

Conclusions: TBI provided once again a greater accuracy for detecting ectasia than other techniques. The TBI was sensitive for detecting subclinical (fruste) ectasia among eyes with normal topography in very asymmetric patients. TBI also confirm unilateral ectasia, characterizing the inherent ectasia susceptibility of the cornea.