

Validity of the keratometric index: evaluation by the Pentacam rotating Scheimpflug camera

何昭德

摘要

Abstract

PURPOSE: To determine the keratometric index based on actual measurements of the anterior and posterior corneal surfaces using a rotating Scheimpflug camera (Pentacam, Oculus) and evaluate the accuracy of this keratometric index in estimating total and posterior corneal powers. **SETTING:** Departments of Ophthalmology, Taipei Medical University Hospital and Taipei City Hospital, Taipei, Taiwan. **METHODS:** The right eye of 221 subjects was measured with the Pentacam system. The radius of the best-fit sphere for the anterior corneal surface (rant) and posterior corneal surface (rpost), mean radius of simulated keratometry (rsimK), and central corneal thickness were obtained. The ratio of rant to rpost (AP ratio) and keratometric index were calculated in each eye. **RESULTS:** The means for rant, rpost, rsimK, and AP ratio were 7.75 mm \pm 0.28 (SD), 6.34 \pm 0.28 mm, 7.75 \pm 0.27 mm, and 1.223 \pm 0.034 mm, respectively. These parameters were normally distributed. The mean calculated keratometric index (Ncal) was 1.3281 \pm 0.0018. Using the keratometric indices of 1.3281 (Ncal), 1.3315 (Gullstrand schematic eye), and 1.3375 (conventional), the mean arithmetic and absolute estimation errors for the total corneal power were, 0.00 \pm 0.24 diopter (D) and 0.17 \pm 0.17 D, 0.43 \pm 0.23 D and 0.45 \pm 0.21 D, and 1.21 \pm 0.24 D and 1.21 \pm 0.24 D, respectively. The total corneal power was predicted to within \pm 0.50 D of the actual value in 95.0%, 60.2%, and 0.9% of eyes, respectively. The mean arithmetic and absolute estimation errors for the posterior corneal power using an AP ratio of 1.223 (this study) or 1.132 (Gullstrand schematic eye) were 0.00 \pm 0.17 D and 0.13 \pm 0.12 D and 0.47 \pm 0.18 D and 0.47 \pm 0.17 D, respectively. The posterior corneal power was estimated to within \pm 0.50 D of the actual value in 97.7% and 60.2% of eyes, respectively. **CONCLUSION:** Using the Pentacam-derived keratometric index improved the prediction accuracies of total and posterior corneal powers.