INFLUENCIAS DE LAS MEDIDAS QUERATOMÉTRICAS EN EL CÁLCULO DE LA POTENCIA CORNEAL EN POBLACIÓN QUE HA SIDO INTERVENIDA DE ABLACIÓN CORNEAL MIÓPICA.

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ABSTRACT.

OBJECTIVES: To estimate the errors that can be done when measuring corneal power using the standardized keratometric index in corneas with previous keratorefractive surgery as well as to propose an algorithm to optimize the calculation of the corneal power from the anterior corneal surface curvature.

METHODS: The formulae for calculating the corneal power in population with previous myopic keratorefractive surgery using paraxial approximation were developed. Furthermore, a review of the scientific evidence of different authors with respect to keratometric indices and anterior and posterior corneal curvature for patients with myopic corneal surgery were performed.

RESULTS: We found significant differences in corneal power calculation between estimations using the Gullstrand and Le Grand eye models, with differences in the exact keratometric index obtained as a function of the corneal curvature. We also defined mathematical equations for each value of radius of curvature of the anterior corneal surface in 0.1-mm steps that allowed the exact calculation of the keratometric index according to the relationship between anterior and posterior curvature. In addition, we also obtained an algorithm providing an estimation of the most optimum keratometric index as a function of the anterior corneal radius. All these results were verified clinically in a samples of eyes that have undergone myopic LASIK.

CONCLUSIONES: The use of a single keratometric index for calculating the corneal power in patients that have undergone myopic keratorefractive surgery can lead to clinically significant errors. This error is easily predictable and can be minimized by the use of a variable keratometric index dependent on the radius of curvature of the anterior corneal surface.