Analysis of the composite structure of the cornea-contact lens assembly in ortho-keratology

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Keywords. Ortho-keratology, contact lens, composite structure

Abstract.
Contact lenses are currently a practical and effective solution for the correction of refractive errors but also for the application of orthokeratology procedures in cases of keratoconus or high myopia pathologies. In ortho-keratology procedures, the contact lenses used are rigid (hard) and are made of biocompatible materials resulting in a composite structure together with the cornea of the human eye. Thus, the contact lenses for orthokeratology have the effect of deforming the corneal surface, in the latter inducing a series of residual and inertial stress states through which changes in the refractive power of the entire eyeball are obtained. This paper presents some aspects related to the approach of the corneal-contact lens composite structure as a set of thin curved plates. Also, the study is completed with the determination of the different dimensions in section and an anisometropic structure which implies an approach of the biomechanical behavioral analyzes, both from the point of view of the elastic component and of the viscosity component manifested in the corneal structure. As shown by specialists, the topography of the cornea is determined by the balanced state between the internal and external forces acting on it and its mechanical rigidity, which is, in turn defined by the geometry of the cornea, the thickness and rigidity of the biomaterial. Therefore, the development of studies on the cornea-contact lens combination in orthokeratology as a composite structure is closest to the real behavior of the whole.

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