PRESENTATION

Corneal optical clarity is essential for ocular function. Follow-up evaluation is required in patients with interstitial keratitis (IK) to ensure appropriate dosage of medications. A major concern in the evaluation of IK could be the inconsistency of non-objective methods for corneal haziness assessment. An objective method of haziness measurement would also be absolutely necessary in research projects, in particular, in a multicenter design to obviate variations and non-uniformity of records between observers. In this article, we discuss the objective measurement of corneal optical density in patients with IK using Scheimpflug-based corneal optical densitometry for assessment of corneal opacity: An objective method to monitor interstitial keratitis.

Figure 1. Nummular corneal stromal infiltrations before treatment.

Figure 2. Decreased stromal infiltrations after treatment.
densitometry; this could be used in a clinical setting and is valuable for research projects.

In our experiment, a 34 year-old male patient with herpetic IK [Figure 1] underwent Scheimpflug-based densitometry, while being treated with 1% prednisolone acetate eye drop (Precord®, Sina Darou, Tehran, Iran) in order to monitor the corneal stromal haze. After 1 month of treatment, along with clinical resolution [Figure 2], the optical corneal density decreased [Figures 3 and 4].

DISCUSSION

Scheimpflug-based optical densitometry of the cornea, as a fairly new imaging method, is able to objectively measure corneal haziness in IK through a quantitative numerical assessment of the backscattered light. Cornea densitometry is provided as an add-on to the standard software of the Oculus Pentacam Scheimpflug device (Pentacam HR; Oculus GmbH, Wetzlar, Germany),[1]

The Oculus Pentacam Cornea densitometry program automatically locates the corneal apex and analyzes an area of 12 mm in diameter around it using gray scale units to represent corneal haziness. These units range from 0 (no clouding) to 100 (totally opaque).[2,3] The first, central, zone covers the annulus over a 2-mm diameter zone, the second covers the 2–6-mm diameter zone, the third covers the 6–10-mm diameter zone, and the last covers the annulus over a 10–12-mm diameter zone.[2]

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**Figure 3.** Corneal densitometry display in the Pentacam before treatment.

**Figure 4.** Corneal densitometry display in the Pentacam after treatment.
The results of this analysis demonstrate the haziness score at three layers of depth: the anterior layer, comprising 120 µm of anterior cornea; the posterior layer, comprising 60 µm of the extreme posterior cornea; and the central layer, located between the anterior and posterior layers. A total densitometry score is also reported that represents the volume between the epithelium and endothelium.[2]

Limited data and experience are available for corneal densitometry in clinical practice.[4] The improvement in optical density in concordance with reduction of inflammatory cells in the cornea could reflect the corneal response to treatment, which is useful in monitoring the treatment response. Objective quantification of corneal optical density with Cornea densito software permits direct comparison of different corneal optical densities[5] and provides a method to gauge the treatment response.

Objective assessment of corneal haziness in IK has the potential to be a noninvasive, easy, rapid, and reliable tool for monitoring the patients. This objective evaluation is invaluable in research projects to eliminate inter-observer variations and for documentation of differences. Further studies and clinical evaluations are required to support our findings.

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Conflicts of Interest
There are no conflicts of interest.

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