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Commentary

Corneal Endothelium Analysis in Middle-Aged Keratoconus Eyes

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ABOUT THE STUDY

Keratoconus (KC) is a condition that causes irregular astigmatism and visual disturbance due to progressive thinning and asymmetric protrusion of the cornea. It is usually diagnosed in adolescence and progresses for 7-8 years before stabilizing. The purpose of this study was to look into corneal endothelial cell parameters and see how they correlated with corneal topographic parameters in middle-aged non-treated Keratoconus (KC) patients. Although the exact cause is unknown, it has been reported that genetics, mechanical trauma, and enzymatic changes in the cornea all play a role. Almost all layers of the cornea are affected histo-pathologically as a result of these factors. KC cases have been reported to have epithelial basement membrane fragmentation, bowman layer tears, stromal thinning, and scarring in various histological studies. In these cases, the endothelial layer has been studied using confocal and specular microscopy.

Flattening of the basal epithelial cells, disturbances in the organization of stromal keratocytes, thickening of the intra-corneal nerves, extension and elongation of the endothelial cells in the region of the cone apex, and fold growth in endothelial cells adjacent to the hydrops cite have all been observed in confocal microscopy studies. In specular microscopy studies, contradictory results have been reported. Some studies found lower Endothelial Cell Density (ECD) compared to healthy eyes, while others found no difference. Similarly, several studies report a decrease in Hexagonal Cell Percentage (HCP) and an increase in Coefficient of Variation (CV) in KC cases, while others report no change. The reasons for the disparities in results could be related to the number of patients included in the studies, the age distribution of the patients, the stages of keratoconus, and previous treatment approaches.

The majority of the studies in the literature frequently evaluated newly diagnosed young patient groups. The progression of KC is highly variable; it can progress rapidly for 3-5 years and then stop or it can progress intermittently over a longer period of time in some cases. Progression is most commonly expected between the ages of 10 and 20, with less progression between the ages of 20 and 30, and no progress after the age of 30.

The goal of this study was to assess corneal endothelial cell parameters and investigate their relationship with corneal topographic parameters in middle-aged KC patients who had not received any treatment. By performing endothelial analysis in the older age group, we hoped to gain a better understanding of the long-term effect of KC on the endothelium.

Our study focused on middle-aged patients who were not expected to progress to KC. We compared the parameters of their corneal endothelial cells to those of similarly aged healthy people. Although there was no significant difference in ECD, we discovered that endothelial cell morphology was significantly affected.

Our study included only patients who had never had a surgical procedure and had no history of contact lens use. The number of patients in the severe stages was lower when the participants were classified according to their KC stage. Notably, such a patient group is difficult to obtain because patients with KC have typically undergone various surgical procedures for visual rehabilitation. Our findings could have been different if we had included more advanced stage patients in our study.

There are several limitations to our study. The technological advances of keratoconus is now diagnosed earlier and more accurately, and various treatments are available in appropriate cases. Because our patient group was so specific, it was impossible to include a sufficient number of patients. In addition, all of our patients had specular microscopy on the central cornea. By evaluating the area closer to the cone region, more accurate results would have been obtained.

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