

Sequential Analysis of Cytokines in Human Tears after Keratoplasty

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Abstract

Corneal graft rejection is one of the most significant complications of corneal transplantation. Presently, there is no quantitative method for predicting the signs of rejection. The purpose of this prospective study was to investigate the kinetics of cytokines in tears and determine the correlation with rejection. The subjects comprised 30 patients, including 24 eyes with penetrating keratoplasty (PKP) and six eyes with lamellar keratoplasty (LKP). All subjects were followed for at least six months. Tear fluid was extracted according to the Schirmer method, and the concentrations of seven inflammatory cytokines (interleukin (IL)-2, IL-4, IL-6, IL-10, tumor necrosis factor (TNF), interferon (IFN)- γ and IL-17A) were measured. Rejection occurred in four eyes after PKP: one eye in the first month, two eyes in the third month and one eye in the sixth month. The IL-6 levels were higher postoperatively, although this increase did not correlate with the incidence of rejection. The preoperative concentrations of IL-2, IL-4, IL-10, TNF and IL-17A in the rejection group were significantly higher than those observed in the non-rejection group ($P < 0.01$, respectively), and the concentrations of IL-2, IL-4, IL-10, TNF, IFN- γ and IL-17A spiked prior to rejection. The levels of these cytokines may be used as markers for predicting corneal rejection after keratoplasty.

Key words: Cytokine, Human tears, Corneal graft rejection, PKP, LKP