Evaluation of IL-6 and TNF-α in Tears and Serum in Age-Related Macular Degeneration

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Abstract

Objective: The purpose of this study was to assess the levels of interleukin-6 (IL-6) and tumour necrosis factor-alpha (TNF-α) in the tears and serum of patients with age-related macular degeneration, as well as to identify the factors associated with IL-6 and TNF-α levels in tears. Methods: This was a comparative, cross-sectional study involving age-related macular degeneration patients and a control group. Tear samples were collected using Schirmer paper strips, while 3 mL of blood was obtained from each patient. IL-6 and TNF-α levels in tears and serum were measured using a commercial human enzyme-linked immunosorbent assay (ELISA) kit. The study analysed the effects of duration of age-related macular degeneration, disease stage, and smoking status on IL-6 and TNF-α levels in tears, aiming to determine their associations. Results: A total of 142 patients were recruited for this study, including 56 patients with early age-related macular degeneration, 56 patients with late neovascular age-related macular degeneration, and 30 patients in the control group. Age-related macular degeneration patients exhibited significantly higher mean levels of IL-6

in both tears and serum, as well as TNF-α in serum, compared to the control group, both before and after adjusting for covariates (21.97 ± 10.95 vs. 16.06 ± 10.00 pg/mL, p = 0.008 and p = 0.014; 12.00 ± 6.04 vs. 8.53 ± 4.13 pg/mL, p = 0.004 and p = 0.004; 18.58 ± 7.90 vs. 13.61 ± 4.86 pg/mL, p = 0.001 and p = 0.004, respectively). Within the age-related macular degeneration group, the mean IL-6 level in serum was significantly higher in patients with late neovascular age-related macular degeneration compared to those with early age-related macular degeneration (13.89 ± 6.08 vs. 10.11 ± 5.41 pg/mL, p = 0.001). The levels of IL-6 and TNF-α in tears were not associated with the duration of age-related macular degeneration, the stages of age-related macular degeneration, or smoking status. Conclusion: There are significantly higher levels of IL-6 in both tears and serum, whereas tears and serum TNF-α serve as non-specific biomarkers for age-related macular degeneration. This study could serve as a basis for future research.

Author keywords

age-related macular degeneration; interleukin-6; tears; tumour necrosis factor-alpha

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