Abstract:

In this study, we aimed to determine the levels of cytokines IL-1β, IL-4, IL-10, IFN-γ, MIF and VEGF in tears derived from healthy subjects. We tested cytokines as potential markers of inflammation for their potential use in clinical practice. Having reliable method for measuring cytokine levels in tears would enable an early diagnosis of eye diseases. In two phases, cytokines in tears of healthy individuals were analyzed using Bio-Plex Cytokine Assay (Bio-Rad). We assessed the suitability of methods for diagnostic purposes as well as the suitability of our selected cytokines.

Statistically significant positive correlations of cytokines were confirmed: IL-10 with IFN-γ (r = 0,81), MIF with VEGF (r = 0,42 / r = 0,49), IL-1β with IL-10 (r = 0,52), IL-1β with IFN-γ (r = 0,55), IL-1β with VEGF (r = 0,38), IFN-γ with VEGF (r = 0,45) and IL-4 with VEGF (r = 0,48) in healthy subjects in tears.

IL-4 (r = -0,37) and IFN-γ (r = -0,42) correlate negatively with age. In healthy individuals, there seem to be no differences with regard to gender, BMI, body fat, time of meal consumption prior to tear collection, eye strain when using a computer, dry eyes. Thus, studied cytokines are suitable for diagnostic purposes.

Significant differences in concentrations of four (IL-1β, IL-10, IFN-γ a VEGF) of the five cytokines were found between the first and second phase. According to acquired results, the method of Bio-Plex Cytokine Assay (Bio-Rad) does not seem to be suitable for clinical use.

Methods using the eye conjunctiva cell surface receptors to assess state of health have been optimized; nevertheless, without the use of anesthetics, cell collection yields are not sufficient.

Key words:

Bio-Plex Cytokine Assay, tears, IL-1β, IL-4, IL-10, IFN-γ, MIF, VEGF, healthy subjects, conjunctival cells, CD 23, HLA-DR, TLR-4, immunocytology corneal epithelium