PECULIARITIES OF AGE-RELATED CATARACT

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Introduction: Age-related cataract (ARC) represents one of the most common diseases in ophthalmology. Its pathogenesis is multifactorial and not fully understood.
Purpose of the study: To measure the concentration of various pro-inflammatory cytokines in the aqueous humor of patients with ARC.
Material and methods: The study included 150 patients with ARC who underwent surgery for age-related cataract (50 patients with incipient cataract, 50 patients with intumescent cataract, 50 patients with mature cataract). The mean age of the patients was 69.2 ± 7.8 years. In the control group we included 23 patients aged 68.9 ± 6.7 years with traumatic conjunctival injuries without ARC. The concentrations of pro-inflammatory cytokines (pg/ml) in the aqueous humor were measured by using the multiplex cytokine analysis.
Results and discussions: IL-1 beta - control group - 0.83 ± 0.07, incipient ARC - 1.12 ± 0.08, intumescent ARC - 1.25 ± 0.09, mature ARC- 1.46 ± 0.1, IL-6 - control group - 71.25 ± 5.8, incipient ARC - 88.86 ± 4.3, intumescent ARC - 94.18 ± 4.7, mature ARC - 106.26 ± 6.3. IL-23 - control group - 47.11 ± 3.3, incipient ARC - 53.24 ± 3.1, intumescent ARC - 55.76 ± 3.1, mature ARC - 58.91 ± 3.4. TNF-alpha - control group - 2.96 ± 0.21, incipient ARC - 3.92 + 0.24, intumescent ARC - 4.37 ± 0.33, mature ARC - 5.82 ± 0.31. ST2- control group - 3.21 ± 0.18, incipient ARC - 3.78 ± 0.15, intumescent ARC- 3.97 ± 0.19, mature ARC - 4.11 ± 0.21. The concentration of IL-1beta, interleukin that triggers the inflammatory response in various tissues, was 34.9% higher in patients with incipient ARC, 53% higher in patients with intumescent ARC, and 75.9% higher in patients with mature cataract than in the control group. The concentration of IL-1beta was 30.4% higher in patients with mature ARC than in patients with incipient cataract. The concentration of IL-6 was 37.8% higher in patients with intumescent ARC and 53.3% higher in patients with mature ARC than in control group. In patients with mature cataract the concentration of IL-6 was 22.96% higher than in patients with incipient ARC and 53% higher than in patients with intumescent ARC. The concentration of TNF-alpha in patients with intumescent ARC was 32,4% higher than in the control group, and in patients with mature ARC nearly doubled (it increased by 96,6%). The concentration of ST 2 was 17,8% higher in patient with incipient ARC than in patient with incipient ARC. The concentrations of IL-5, IL-7, IL-15, IL-21, IL-22, IL-27 and IL-31 in patients with ARC have not changed significantly.
Conclusions: The findings of our study indicate a significant elevation of pro-inflammatory cytokines, especially IL -1-beta, IL-6, IL-23, TNF-alpha and ST 2 in the aqueous humor of patients with ARC. The concentration of pro-inflammatory cytokines in patients with mature cataract (IL-1 beta, IL-6, TNF-alpha, and ST 2) was higher than in patients with incipient and intumescent cataract.