

THE SIGNIFICANCE OF CERTAIN PRO-INFLAMMATORY CYTOKINES IN THE DEVELOPMENT OF PERIODONTAL INFLAMMATORY DISEASES

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Cytokines play an important role in the immune system, participating in the coordination of immune responses, communication between immune and non-immune cells, and in inflammatory and adaptive processes. Cytokines are produced by immune cells (macrophages, T and B lymphocytes, dendritic cells) as well as by non-immune cells. Coordinated interactions among cytokines ensure effective protection against infections, while preventing excessive or prolonged immune responses, which may otherwise lead to the development of autoimmune and inflammatory diseases.

Aim of the study. To evaluate cytokine levels in patients with gingivitis and periodontitis.

During the study, patients of the main group (n = 90) were reclassified according to the type of periodontal disease into a group of patients with gingivitis (n = 42) and a group of patients with periodontitis (n = 48). Cytokine levels were analyzed comparatively between these groups and the control group. In patients of the main group, the level of IL-2 was found to be statistically significantly increased by nearly 2.12 times compared with the control group ($p < 0.01$), where the IL-2 level was 9.46 ± 0.54 .

On the other hand, the levels of IL-12 and IL-17A in the main group were 7.88 ± 0.69 and 9.69 ± 1.65 , respectively, exceeding the control group values by 40.0% ($p > 0.05$) and 3.02 times ($p > 0.05$), respectively. The concentration of IL-2, in particular, was significantly higher in patients with gingivitis (12.88 ± 0.90) and periodontitis (26.45 ± 2.53) compared with the control group, by 1.36 times ($p < 0.05$) and 2.8 times ($p < 0.0001$), respectively ($p < 0.001$).

Similarly, IL-17A levels were increased in patient groups compared with the control group by 1.84 times ($p < 0.05$) and 4.03 times ($p < 0.05$), respectively. In contrast, no statistically significant difference was observed in IL-12 concentrations between the patient groups and the control group ($p > 0.05$).

Additionally, to determine the prognostic significance of the studied indicators in disease development, sensitivity (SE), specificity (SP), diagnostic efficiency (AUC), and odds ratio (OR) as a risk factor reflecting pathogenetic significance were evaluated. It was found that abnormal IL-2 levels demonstrated

a moderate prognostic value in predicting gingivitis (AUC = 0.60). Diagnostic efficiency was evaluated as follows:

- 100–90% or 1.0–0.9 – excellent;
- 90–80% or 0.9–0.8 – very good;
- 80–70% or 0.8–0.7 – good;
- 70–60% or 0.7–0.6 – moderate;
- 60–50% or 0.6–0.5 – satisfactory;
- <50% or <0.5 – unsatisfactory.

Furthermore, the prognostic value of abnormally elevated IL-12 and IL-17A levels (relative to the control group) in the development of gingivitis-type periodontal disease was assessed as unsatisfactory (AUC = 0.48) and satisfactory (AUC = 0.52), respectively. Among the evaluated indicators, IL-2 demonstrated the highest diagnostic efficiency in predicting the presence of gingivitis.

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