BIOCHEMICAL AND CYTOKINE CHARACTERISTICS IN ASSESSING THE SEVERITY OF BURN DISEASE PROGRESSION

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Abstract. *Thermal burns are one of the most pressing issues in modern medicine, and their clinical course is closely related to the extent and depth of the injury, as well as the biochemical and immunological changes occurring in the body. Extensive burns trigger a systemic inflammatory response, which often leads to the progression of burn disease and systemic complications, including multiple organ failure.*

In burn patients, disturbances in metabolic processes, increased release of pro-inflammatory mediators, and impaired immune function are major pathogenic factors affecting disease severity. In particular, the dynamic changes of cytokine levels and certain biochemical markers reflect the body's response to burn injury.

This study highlights the diagnostic significance of biochemical markers and cytokine characteristics in assessing the severity of burn disease progression. Early and comprehensive analysis of these parameters allows for

predicting disease course, evaluating treatment effectiveness, and selecting an individualized therapeutic approach.

Keywords: *Burn disease, biochemical markers, immune system, IL-6, IL-8, CRP, IgM, IgG, inflammation, immunodeficiency.*

Objective. To identify the characteristics of biochemical and cytokine markers at different stages of burn disease.

Materials and Methods. The study included a total of 50 patients hospitalized with burn injuries. According to clinical severity, patients were divided into three groups: 25 patients with mild burns (Grade I), 20 patients with moderate burns (Grade II), and 5 patients with severe burns (Grade III). The patients were aged between 18 and 60 years, with 60% males and 40% females.

The main causes of burns were hot liquids (47%), open flames (38%), and electric current (15%). The study was conducted at the Department of Clinical Laboratory Diagnostics and DKTF Clinical Laboratory Diagnostics Course, Samarkand State Medical University, in collaboration with the Combustiology Department of the Samarkand Branch of the Republican Scientific Center of Emergency Medical Care.

Biochemical blood parameters were measured using photometry. Cytokines were quantified using the immunochemiluminescent assay (IXLA) method with specific antibodies bound to latex particles.

Results. The study demonstrated that with increasing burn severity, significant changes in patients' biochemical and immunological blood parameters were observed. In Grade I burns, primarily mild biochemical changes reflecting a low-level inflammatory response were noted. In Grades II

and III burns, there was a marked increase in C-reactive protein (CRP), aspartate aminotransferase (AST), and alanine aminotransferase (ALT) levels. In patients with severe burns (Grade III), pro-inflammatory cytokines, particularly interleukin-6 (IL-6) and interleukin-8 (IL-8), were significantly elevated, confirming the presence of a strong systemic inflammatory response.

Conclusion. The findings indicate a direct correlation between burn severity and biochemical and cytokine changes in the body. Severe burns are associated with a marked increase in pro-inflammatory cytokines IL-6 and IL-8, reflecting activation of systemic inflammation. Additionally, elevated CRP, AST, and ALT levels serve as key laboratory indicators of the intensity of the inflammatory process. These results demonstrate the diagnostic value of biochemical and immunological markers in assessing burn severity, monitoring clinical progression, and guiding effective treatment strategies. The study confirms a reliable and close relationship between burn severity and the body's biochemical and immune response.