DIAGNOSTIC VALUE OF CIRCULATING IMMUNE COMPLEXES AS INDICATORS OF SYSTEMIC INFLAMMATION IN CHILDREN WITH EPIDERMOLYSIS BULLOSA

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Background: Epidermolysis bullosa (EB) is a group of rare, genetically determined skin disorders characterized by extreme fragility of the skin and mucous membranes. Although primarily considered a structural disease, increasing evidence supports the involvement of systemic inflammation in its pathogenesis. Circulating immune complexes (CICs), as immune mediators and markers of chronic inflammation, have not been extensively studied in EB, especially in pediatric patients.

Keywords: epidermolysis bullosa, circulating immune complexes, pediatric inflammation, humoral immunity, immunopathogenesis

Objective: To evaluate the diagnostic and prognostic significance of CICs of different molecular sizes in children with EB during exacerbation.

Methods: The study included 42 children aged 2 to 12 years with clinically and genetically confirmed EB, hospitalized in the Republican Center of Dermatology, Uzbekistan. Serum CICs were quantified using a spectrophotometric method based on precipitation with 3% and 4% polyethylene glycol (PEG) solutions to distinguish large and small molecular complexes, respectively. Measurements were conducted within the first two days of hospitalization before initiating anti-inflammatory therapy. Statistical significance was evaluated using Student's t-test.

Results: The average level of large CICs (3% PEG) in EB patients was 47 ± 1.9 optical density (OD) units compared to 6.5 ± 1.12 in healthy controls, representing a 7.2-fold increase. Small CICs (4% PEG) were elevated to 39 ± 1.2 OD units vs 4.6 ± 0.88 in controls, indicating an 8.5-fold rise. The CIC3%/CIC4% ratio increased from 1.1 in healthy children to 1.7 in EB patients, suggesting an imbalance in immune complex composition and a marker of systemic inflammation.

Conclusion: This study demonstrates that both large and small circulating immune complexes are markedly elevated in pediatric EB during active disease. The altered ratio of CIC3% to CIC4% reflects an immune imbalance and may

serve as a valuable biomarker of systemic inflammation in EB. These findings highlight the potential utility of CIC profiling in disease monitoring and future personalized interventions.