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Regulatory Profile Changes of Lymphocytes and Peripheral Blood Monocytes in Children with Candidiasis Associated with Chronic Somatic Diseases

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Abstract In this paper, we report results of the study of immune parameters with the assessment of regulatory and effector subpopulations of lymphocytes and monocytes with candidiasis in children with chronic somatic diseases (secondary pyelonephritis and obstructive diseases of the upper gastrointestinal tract). Candidiasis was diagnosed by the rising level of circulating *Candida albicans* mannan antigen and culture mycological research. It was found that the persistence of fungi is associated with differentiated regulatory changes in the structure of subpopulations of lymphocytes and monocytes with preferential increase of immunosuppressive cells (CD4+ CD25+hi, CD3+CD16/56+, CD3−CD8+, CD3+4−8−) amid reduction of effector subpopulations of lymphocytes and antigen presenting cells associated with Th1 immune response profile.

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1 Introduction

The widespread occurrence of immunodeficiency disorders in children characterized by chronic inflammatory conditions determines the growth of lesions triggered by fungi of the genus *Candida*. Most studies examine the pathogenic role of immunodeficiency disorders in triggering, chronicity, and progression of fungal invasions in the setting of chronic somatic diseases [1–3]. The persistence of fungi of the genus *Candida* is a marker of an immunodeficiency state, mainly of a cellular immunity [3, 4]. The main mechanisms of the fungal flora effect involve the impact on the immunological reactivity of fungal components, of which the antigens of the cell wall are the most important ones [3, 5, 6]. Mannoprotein antigen of *Candida albicans* has an ability to initiate the synthesis of anti-inflammatory cytokines such as IL-4 and IL-10 and provoke the increased production of interleukin-10 and survival of CD4+CD25+ hi cells [7]. Yeast mannan suppresses phagocytosis by the induction of interleukin IL-4 production; the mechanisms limiting the ejection of oxygen and nitrogen derivatives toxic to the fungus have been described [8]; it influences the expression of aging markers in peripheral blood cells through neutrophils, monocytes, and macrophages receptor apparatus, in which case monocytes lose their ability to secrete interleukin-12 and convert naive T lymphocytes into memory T cells [9]. The fungus component's effect on the immunological profile has been examined mainly in adult patients; at the same time, the etiopathogenic aspects of the fungal flora effect on the mechanisms of immunodeficiency formation in children are still insufficiently studied. In view of this fact, the immunological profile of children diagnosed with