The Immune System in Children with Different Incidence Rates Ard

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Abstract: The article is devoted to the study of the immune system (IS) and cytokine status in frequently ill children (FIC) in the acute phase and remission in comparison with rarely ill with children (RIC). The immune status in these children not infrequently formed were transiently response by Th2-type by hyperproduction of IL-4 and IL-1ß, stimulating high production of IgE by B lymphocytes IgA against decrease synthesis.

Key words: frequently and rarely ill children, immune system, cytokine status, respiratory diseases.

Foreword. Problem defeat limfoadenoid pharyngeal ring Pirogov-Waldeyer from FIC is relevant, since this tissue is morphofunctional substrate local immunity. In terms of lymphoid tissue hyperplasia and concomitant chronic exudative-proliferative inflammatory viral infection begins to exhibit the properties of the trigger, inducing infectious-dependent immunopathological condition, as well as autoimmune reactions, often manifested by at FIC [1, 3]. Recent studies have shown that FIC even during clinical well-being and the absence of signs of acute respiratory diseases (ARD) identifies distinct changes in cell-cell interactions in the immune system: significantly increased the content of pro-inflammatory interleukins (IL-2,IL-4), including interleukins involved in chronic inflammation (IL-6, IL-8) [2]. This is accompanied by a decrease in cell cytotoxicity and increased levels disimmunoglobulinemia cells expressing receptors that induce apoptosis. In this regard, we have been set a target [6, 8].

The purpose of this work was to examine the performance of the immune system in FIC and RIC, depending on the stage of the disease in a comparative perspective.

Material and methods. We carried out a study on the state of the immune system in children surveyed, depending on the stage of the disease (remission and relapse stage): In the group of FIC, the number of children was 28, whereas in the group (RIC) - 20.

Criteria for selection of children in the FIC group formulated in 1986 and V.Yu.Albitskiy, A.A.Baranov:

- up to a year - 4 and more;
- up to 3 years - 6 or more;
- 4-5 years - 5 or more;
- Over 5 years - 4 and more.
This takes into account acute viral respiratory infections (SARS), and exacerbation of chronic diseases of ENT - organs and respiratory tract (I.E.Elagina, M.R.Bogomilsky, 2004). Immunological studies were performed at the Institute of Immunology of the Academy of Sciences of Uzbekistan.

The main parameters of cellular and humoral immunity was determined by identifying the cell surface cluster of differentiation of CD3, CD4, CD8, CD16, CD19 with monoclonal antibodies Series LT (LLC "Sorbent Service", Russia). The study of the concentration of serum immunoglobulin A, M, G in peripheral blood was performed according to the method Mancini G. et al (1965). Levels of cytokines (IL-1b, IL-4 and TNFα), IgE and sIgA in nasal washes were determined by ELISA (cytokines produced by "Cytokine", St.-Petersburg). Statistical analysis of the data was obtained using the Fisher–Student tests of variation statistics.

**Results and discussion.** The next stage of our work was to study the above immune-logical parameters, depending on the stage of the underlying disease. Analysis of the data showed a significant difference, as in the period of exacerbation and remission in level CD3+-lymphocytes in sickly children compared to those suffering from rare (P<0,05). Also, a significant difference was observed in the reduction of CD4+-lymphocytes in sickly children in the acute phase (P<0,01). The smallest number of T-suppressor cells defined in the acute stage at FIC, but fluctuations are unreliable, that still caused significant reduction in the immunoregulatory index in the group. In the group of FIC in remission as a decline of the index, but compared to the RIC data unreliable. In studying the factors of nonspecific protection significant difference of all parameters in the acute phase and in remission from frequent and prolonged ill children[7].The regulatory cytokine Interferon α (IFN-α) provides the most pronounced antiviral effect, IFN-α plays an important role in the formation of clinical manifestations of respiratory infections. IFN-α in viral infections is the most important factor of primary protection. In frequently ill children (FIC), an increased level of IFN-α was natural against the background of private colds. This provides a basis for the use of IFN-α as a prognostic marker. With an increase in the level of IFN-α, it is possible to assume the development of bacterial complications in the presence of acute respiratory viral infections in patients [4]. The level of natural killer cells in the group of FIC in the acute stage was 18,0 ± 1,1%, and in remission - 13,9 ± 0,7% in comparison with the group RIC - 14,3 ± 1,0% and 11 , 2 ± 0,7%, respectively (P<0,05). Data analysis of the phagocyte activity of neutrophils showed that in the period of acute level of phagocytosis was significantly reduced, both in the group RIC, and in the FIC group (54,5 ± 1,2% vs 50,7 ± 1,1%, p <0,05 and 48,3 ± 1,2% vs 43,6 ± 0,9%; p<0,05). Rate increase was observed in the content of B cells (P<0,05).

Revealed that the FIC with concomitant ENT-organs pathology shows signs disimmunoglobulinemia with higher levels of IgG, and a significant decrease in the concentration of IgA, IgM more pronounced in the acute stage of the basic pathological process.

In particular, the level of IgG group FIC in the acute stage was 1420 ± 38 mg %, and in remission - 1160 ± 22 mg % in comparison with the group RIC - 930 ± 19 mg % and 1050 ± 25 mg %, respectively, (P<0,01-0,001). It should be noted marked decrease secretion of IgA in the acute stage at FIC (P<0,01). In other words, the spread of inflammation to the lymphoid tissue of the upper respiratory tract is associated with severe proliferative IgA, indicating mobilization of reserve capacity of local immunity in chronic inflammation.

Modern scientific research does not recognize any connection between cooling the body and infectious diseases, however, water with temperatures below 5 ° C can cause colds in children, especially those prone to colds. When local tissues are exposed to cold, the permeability of tissue blood vessels decreases, blood circulation slows down, tissue nutrition deteriorates, and the immune system weakens[5]. With frequent acute respiratory epithelial damage the respiratory tract gets receptor hypersensitivity to external influences. In the immune status of these children are often transiently formed response to Th2-type with overproduction of IL-4 and IL-1B, enabling high production of B-
lymphocytes against decrease in IgE synthesis of IgA. In our study showed a significant decrease in IL-1β in the acute stage at FIC, P <0,05, and in remission on the contrary increase that is more than 2-fold compared with a group of children suffering from rare, P <0,05. The level of IL-4 in sickly children during episodes of exacerbation was significantly increased (18,1 ± 2,4 pg/ml vs 13,5 ± 1,6 pg/ml in the RIC, P <0,05).

A similar trend is observed in the study of the level of TNFα. Progressive dynamics increasing concentrations of IL-4, TNFα in the serum of sickly children in the acute phase of the basic pathological process is associated with a more pronounced effect of the exposure of frequent and complicated by recurrent episodes of infection of the upper respiratory tract for a long time.

Thus, the FIC is a problem that has not only medical, but also the socio-economic aspect, which requires a comprehensive approach to deal with it in the implementation of therapeutic, rehabilitative and preventive measures for the FIC.

Depending on the stage of the underlying disease revealed significant differences, both in acute and in remission. The level of CD3+, CD4+ lymphocytes, phagocyte activity of neutrophils and immunoregulatory index in frequently ill children in the acute stage in 1,2 times less, than compared to remission, and the level of natural killer cells in 1,4 times in both groups in the acute stage[7].

**Conclusion.** FIC with concomitant ENT pathology detected signs of syndrome of disimmunoglobulinemia with higher levels of IgG indicating the long antigenemia and chronic intoxication, and a significant decrease in the concentration of IgA, IgM. A significant decrease in the level of IL-1β in the acute stage, the FIC, while in remission on the contrary increase that is more than 2 times in comparison with a group of RIC. Progressive dynamics up concentration IL-4, TNFα in the blood serum of FIC acute stage primary pathological process associated with a more pronounced influence of the exposure to frequent and complicated process infectious relapse episodes of upper respiratory tract for a prolonged time.

**References**