



## Basic immunological parameters in patients with otitis externa

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It is generally believed that chronic infections of mucous coat and skin in most cases occur under some quantitative deviations of key cell parameter of immune system and (or) functional insufficiency of separate cells. For example, hemophage. It was established in previous works that local immunity factors in earwax are defined rather distinctly and in some cases their quantitative deviations are associated with clinical manifestations of external otitis. Along with that, information on the immunity factors state at recurrent external otitis is not enough to define the roles of different chains of immune system in pathogenesis of external otitis. For the purpose of expanding the understanding of the external otitis pathogenesis factors and establishment of effective approach to treatment order we studied the state of some system factors of immunity in peripheral blood at patients with external otitis in remission and in process recrudescence.

### Materials and methods

36 people at the age from 14 to 55 were examined, 16 of them suffered from external otitis in infiltrative form, and 10 practically healthy donors formed placebo group. Besides to compare changes in immune system at external otitis one investigated similar indices in 10 patients with furunculosis in neck and head area.

The repeated investigation was conducted under the lack of clinical signs of disease, after 1.5-2 months after treatment and disappearance of clinical signs of disease as a rule.

Antibodies to the following antigens from microorganisms were defined in peripheral blood: to protein A of *S. aureus*, proteoglycan of *Klebsiella pneumoniae*, streptolysin-0 of hemolytic streptococcus and to lipopolysaccharide of *Escherichia coli*; one investigated the content of interferons  $\alpha$  and  $\beta$ , interleukine-1 $\beta$ , immunoglobulin class M, G, A, as well as activity of phagocytizing and natural cytotoxic blood cells.

At cytokine and immunoglobulin definition microparticle enzyme immunoassay was used, chemical reagents produced by Russian company "Protein contour" were used, "Chema-Medica" and "Vektor-Best", automated enzyme-immunoassay analyzer Stat-Fax 2100 (USA). Antibodies to *Klebsiella* antigens, *S. aureus* and *Escherichia coli* were investigated using the sets of "LATEST" in reaction of passive hemagglutination in accordance with instructions to the set, and antibodies to streptolysin-0 were revealed in neutralization reaction using Takashi microtiter. Phagocyte activity was investigated in relation to latex particles, at this granuloplectic index was calculated (granuloplectic index is the number of cells participating in latex particles absorption) and phagocyte index (number of particles absorbed by one

phagocytizing cell). The activity of natural cytotoxic cells was investigated in relation to xenogenic erythrocyte (chickens), using spectrophotometric registration method for hemolysis efficiency on hemoglobin findings.

The results were processed statistically using nonparametric criteria U.

### Investigation results

It was established that under the recrudescence of recurrent external otitis in patients it is reported on the increase in antibodies content to antigens from microorganisms, pro-inflammatory cytokine – interleukine 1 $\beta$  and both types of interferons, phagocyte and cytolytic activity of blood cells are increased. An increased content of immunoglobulin of M class is discovered in investigated immunoglobulins of different types under aggravation of pathologic process in the outer ear and skin furunculus.

At clinical state of remission an increased number of Ig level, decreased level of phagocyte activity (on phagocyte index) and extremely low concentration of early interferon- $\alpha$  are kept in part of the investigated patients with external otitis. At these antibody titres to streptolysin-0 and protein A of *S. aureus* such patients remained higher than in control group. The indicated shifts in indices of system immunity is characteristics for process prolongation when insufficiently effective elimination of etiological component. Clinical and immunology research in patients both with external otitis (infiltration form), and with recurrent skin furunculosis (neck and head area) allowed to establish that more frequent disease recurrence is reported in persons with the following deviations without disease aggravation in state of the studied factors of system immunity in comparison with control group:

- High IgM level
- Low phagocyte activity
- Low concentration of early interferon ( $\alpha$ )
- High antibody titres to streptolysin-0 and protein A of *S. aureus*

Discovered deviation in the state of system immunity in persons with infectious inflammatory diseases of external ear canal skin and under the recurrent skin furunculosis are practically identical and associated on several parameters with the data from other authors.

Thus, deviations in above mentioned indices of humoral immunity can be used as diagnostics criteria for inflammatory process in outer ear and are the basics for treatment of such patients using immunocorrectors.