

IMMUNE REACTIVITY UNDER POLYGNIC CHRONIC TONSILLITIS

Rakhmanova S.S., Nuraliyev N.A.

Urgench subsidiary of Tashkent medical academy, Tashkent, e-mail: Hamida_R@rambler.ru

A microflora of pharynx and antimicrobial immunity indexes among 68 patients with chronic tonsillitis and 35 healthy persons were studied. Most frequently representatives of gram-positive flora were registered, dysbiosis of mucous membranes was established among all inspected patients, sensitivity to cephalixin was high among the majority of *S. pneumoniae*, *S. pyogenes*, *S. aureus*, and *Haemophilus sp.* strains. A decrease in major indexes of antimicrobial immunity (PAN, PN, PPI) among patients allows us to judge on the expression of pathological process. Raised titles of anti-streptococcus antibodies were registered among 2/3 of patients.

Keywords: tonsillitis, aetiological agents, microflora, phagocytosis, antibodies, resistance, immunity

Acute and chronic tonsillitises are one of the most commonly spread infection diseases [1, 3, 9]. Among adults a disturbance of palatine tonsils is typical, while for children adenitis – an inflammation of throat tonsil is more common. Chronic diseases of ENT organs can be considered as a particular display of an immunodeficiency that is dependent by a defect in mononuclear phagocytosis system [1, 5].

The main bacterial tonsillitis stimulant is considered β – haemolytic streptococcus of group A, presence of which is registered among 31 % of patients [10]. Among other possible stimulants mentioned are streptococci of other groups, aureococcus, enterobacterias, haemophilus influenza [2, 6, 8, 9].

In human organism to a penetration of an microorganism from the environment first of all reacts its immune system, particularly phagocytosis and then antimicrobial antibodies are produced [5]. An organism's condition and immune system are directly linked to a presence of infection inflammation in organisms. Among patients with acute and chronic purulent-inflammatory diseases a decrease in their organism's resistancy – non-specific protection factors is registered [7].

In this case the objective of the present research is a complex study of a condition of pharynx microflora and antimicrobial immunity among patients with chronic tonsillitises in a comparative aspect.

Materials and methods of research

68 patients (44 adults and 24 children) with chronic tonsillitis (CT) were under inspection. Children age was between 3 and 15 years, adults – from 16 to 45 years. Control group was formed from 35 healthy persons (20 adults and 15 children) whose sexual and age composition was representative to the main group. Patients' inspection and diagnosis verification was carried out via standard methods that are accepted in the clinic of ENT organs diseases on basis of Khoremzskiy regional multi-profile medical centre of Uzbekistan Republic.

Patients' pharynx microflora and major antimicrobial immunity indicators were studied.

Pharynx and nasopharyngeal mucus microflora was studied according to commonly-accepted bacteriological methods: material collection, sowing into nutritious en-

vironments, discharge of clean micro-organisms' culture and its identification. Identification was carried out in accordance with guides and determiners Bergey's; Manual of Systematic Bacteriology (1997). Microbiological research of nasopharynx and pharynx abstract was carried out before treatment and 3 days after the end of taking antimicrobial preparations.

Phagocytosis activity of neutrophils (PAN) of periphery blood was defined via conventional method, based on their ability to absorb micro-organisms with a calculation of microbes absorption percentage – phagocytosis number (PN) and phagocytosis protection index (PPI). As a testing microbe we used day cultures of *E. coli*, *S. aureus* and β -haemolytic streptococcus of group A. PPI criterion was used to estimate functional activity of phagocytosis. PPI results were estimated in dependence on phagocytosis completeness in 2 groups: PPI < 50 % and PPI > 50 % (PPI degree criterions). The level of anti-streptococcus antibodies in blood serum was revealed with indirect hemagglutination test with a commercial erythrocytic diagnosticum by the conventional method. Statistic processing of the material was carried out in accordance with commonly-accepted methods with usage of applications for medic-biological disciplines.

Results of research and their discussion

The analysis of possible aetiological agents and the attendant microflora among the inspected patients with chronic tonsillitis showed the following. During microbiological study of deep palatine tonsils the following conditionally-pathogenic micro-organisms were registered: *S. viridans* (5,8%), *S. aureus* (39,7%), *S. epidermidis* (3,3%), *S. pneumoniae* (29,7%), *S. pyogenes* (11,6%), *S. saprophyticus* (7,3%), *Haemophilus sp.* (5,8%) and *E. coli* (10,5%), in 5,0% of cases flora growth was not registered.

In 8,3% of cases monoculture of the revealed micro-organisms was obtained, and in 86,7% of cases – micro-organism associations. Associations generally consisted from two or three micro-organisms (*E. coli*, *S. aureus*, *S. pyogenes*, *S. epidermidis*, *Haemophilus sp.*). Sowing ability of a monoculture or micro-organisms association did not depend on a patient's gender and age ($p > 0,05$). Besides, no direct or strong correlation of a culture or micro-organism association sowing ability and a patient's condition during the research (exac-

erabation or remission) was found. Obviously, it is related to a decrease in immune system of an organism, particularly non-specific factors of local immunity that, being «the first line of defence», must eliminate micro-organisms without giving this dependently-pathogenic organisms an opportunity to grow over the limits of norm for a normal pharynx microflora.

During bacteriological research of nasopharynx mucus specific composition of the higher breath tracts was quite diverse in comparison with indexes of microbiological studies of deep tonsil departments ($p > 0,05$). The obtained results of microbiological research of both biotypes among patients with CT allows us to conclude that microbial picture under CT is characterized by the diversity of gram-positive and gram-negative microflora sowing ability and this pathology differs from other nosological units by its bacterial polygenecy.

The obtained results show that a disbiosis of mucous membranes is registered among all inspected patients: among 86,6% of them a combination of 2 of more dependently-pathogenic and pathogenic micro-organisms' strains, and among 78,3% – a high revealing of dependently-pathogenic micro-organisms and lack of normal microflora strains.

Along with microbiological research we have carried out a study of the main antimicrobial immunity indicators of the CT patient in a comparative aspect.

The results of the CT patients' inspection and the control group have shown a reliable decrease in natural protection factors with a decrease in PAN. The research has found out that among patients a reduction in this indicator is registered, especially with E.coli ($43,1 \pm 0,6\%$ against $59,4 \pm 0,7\%$ in the control), and also with other studied micro-organisms (table 1).

Table 1

Indicators of phagocytosis activity of neutrofiles among patients with CT

Indicator	Control	E.coli	S.aureus	β -haemolytic streptococcus of group A
PAN, %	$59,4 \pm 0,7$	$43,1 \pm 0,6^*$	$45,1 \pm 0,9^*$	$49,4 \pm 0,7^*$
PN, units	$8,9 \pm 0,2$	$6,1 \pm 1,0^*$	$5,7 \pm 0,8^*$	$3,7 \pm 0,4^*$

Comment: * – difference reliability against the control.

The study of microbes' absorption percentage (PN) has shown that PN with E.coli equaled in average $6,1 \pm 1,0$ units, with S.aureus this index equaled $5,7 \pm 0,8$ units, and PN with β -haemolytic streptococcus of group A equaled in average $3,7 \pm 0,4$ units that is reliably lower than the control and other micro-organisms indexes, described above.

Simultaneously with PAN and PN a decrease in PPI against the studied micro-organisms was registered ($p < 0,001$). In has been

found out that PPI for E.coli as a testing microbe was lower than 50% among $22,0 \pm 1,0\%$ of patients (table 2). While using S.aureus as a testing microbe $PPI < 50\%$ was registered among $31,0 \pm 2,0\%$ of patients. Distinctive indexes were obtained in relation with the first two testing microbes during the study of β -haemolytic streptococcus of group A – $PPI < 50$ among $68,0 \pm 2,0\%$ of patients. All PPI indexes were relatively higher than the same indexes of health persons ($p < 0,001$).

Table 2

Index of phagocytosis completeness among patients with CT (%)

Index	E.coli	S.aureus	β -haemolytic streptococcus of group A
Control	< 50%	$12,0 \pm 2,0$	$8,0 \pm 2,0$
	> 50%	$88,0 \pm 6,0$	$92,0 \pm 5,0$
Patients with CT	< 50%	$22,0 \pm 1,0$	$31,0 \pm 2,0$
	> 50%	$78,0 \pm 3,0$	$69,0 \pm 4,0$

Comment: * – difference reliability against the control.

Our attention draws the fact that PPI dramatically decreases among patients against the healthy. Probably, it is linked to a decrease in

the general immune system, and insolvency of the phagocytosis system is another criterion of a pathological process chronisation under CT.

Usage of an organism's non-specific resistance – PPI and PN as an estimation criterion with different testing microbes among patients with CT allowed us to study their reliable difference in comparison to β -haemolytic streptococcus of group A ($p < 0,05$). The revealed PPI is lower than 50% among $68,0 \pm 2,0\%$ of patients and the decrease in PN with β -haemolytic streptococcus of group A in comparison to the control (2,4 times), to *E.coli* (1,7 times), and *S.aureus* (1,5 times) shows us an insolvency of phagocytosis activity among adult patients with CT.

To reveal alterations in antimicrobial immunity under CT in relation with age, an analysis of these indexes was carried out according

to age groups of adults (under 20, from 20 to 30, from 30 to 45 years old) and children. No reliable difference was established between age groups in their levels of the studied parameters ($p > 0,05$).

A powerful factor that provides for an antimicrobial immunity are antibodies that participate in capturing and elimination of microbial antibodies and their endotoxins. Considering an important place of β -haemolytic streptococcus of group A in pathogenesis and chronisation of processes in tonsillitis we studied a revelation level of anti-streptococcus antibodies among patients with CT of different ages (table 3).

Table 3

Indexes of revelation frequency of anti-streptococcus antibodies among patients with CT in the disease dynamics, %

Patient group	Chronic tonsillitis	
	Exacerbation period	Remission period
Adult patients with CT	$63,6 \pm 3,0$	$38,6 \pm 2,7^*$
Children with CT	$54,2 \pm 2,1$	$16,7 \pm 2,0^*$
Control group	$5,7 \pm 1,0$	$5,7 \pm 0,5$

Comment: * – difference reliability.

The revelation frequency of anti-streptococcus antibodies in blood of patients with CT equaled $63,6 \pm 3,0\%$ within first days of disease, in $38,6 \pm 2,7\%$ of cases within the period of symptoms' subsidence. Raised titles of streptococcus antibodies in comparison to norm are registered among 2/3 of patients.

Conclusion

1. Among patients with CT from biomaterial the most frequently discharge representatives of gram-positive, dependently-pathogenic microflora, a disbalance in the composition of normal mucous membranes microflora is established among all inspected patients, sensitivity to cephalixin was high among the majority of *S.pneumoniae*, *S.pyogenes*, *S.aureus*, *Haemophilus sp.* strains.

2. A decrease in major indexes of antimicrobial immunity system (PAN, PN, PPI) under CT among patients allows us to judge on the expression of a pathological process.

3. Usage of non-specific organism resistance index – PPI as an estimation criterion with different microbes among patients with CT allowed us to establish its reliable difference in comparison to β -haemolytic streptococcus of group A.

4. The revealed raised titles of anti-streptococcus antibodies in blood serum of patients with CT in comparison to the control that were

registered among 2/3 of the inspected shows us a strain in the immune system of patients.

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