ABSTRACT

The aim: To compare the content of α and γ-interferons, interleukins 1β, 4, 10, IgA, IgG, as well as the level of the general forms of immune complexes in tissue extracts from tonsils of children with hypertrophy and chronic tonsillitis.

Materials and methods: We studied tonsils of 25 children aged 5-12 years with hypertrophy of palatine tonsils (HPT) and with chronic tonsillitis (CT). The content of α and γ-interferons, interleukins 1β, 4, 10, IgA, IgG in tonsil extract was determined by immunofluorescence assay. Immune complexes were determined using sedimentary test (3.75% solution of polyethylene glycol).

Results: In tissue extracts from tonsils with CT, there is a predominance of inflammation factors, potential sensitization, and the development of immunopathological reactions. The presence of inflammation is indicated by elevated levels of interleukins-1β, immunoglobulin G. High levels of interleukin-4 may indicate that both HPT and CT have a tendency to increase sensitization to microbial and other antigens.

Conclusion: The results indicate a significant difference in the qualitative and quantitative state of inflammation factors and allergy in case of HPT and CT. In tonsils with CT, there predominates both simple and allergic inflammations, as well as immunopathological reactions.

KEYWORDS: Hypertrophy of palatine tonsils, chronic tonsillitis, inflammation factors, allergy
form determination by immunoenzyme method (Hema reagents, RF).


RESULTS

Data on the content of immune complexes are presented in Figure 1, which shows that the number of immune complexes in tonsillar tissues is twice lower in case of hypertrophy than in case of chronic tonsillitis.

Data on the content of interferons in extracts from tonsils in case of hypertrophy and chronic tonsillitis are presented in Table 1.

Data on the content of interleukin-4 are presented in Figure 2, and the ratio of γ-interferon / interleukin-4 in Figure 3.

From the data in Figure 2 it follows that the levels of this cytokine in case of hypertrophy of palatine tonsils and chronic tonsillitis are about the same, and the ratio of γ-IFN and IL-4 is less in case of chronic tonsillitis (0.93) than in case of hypertrophy of palatine tonsils (1.21) (Figure 3). It indicates a greater tendency of the tonsillar tissue to form an immunopathological pro-allergic response in case of chronic tonsillitis [11].
Table 1. The content of α and γ interferons in tissue extracts in case of HPT and CT.

<table>
<thead>
<tr>
<th>Groups</th>
<th>α-IFN, pg/ml</th>
<th>γ-IFN, pg/ml</th>
</tr>
</thead>
<tbody>
<tr>
<td>HPT (n=11)</td>
<td>41.0 (34-50)*</td>
<td>137.8 (91-190)**</td>
</tr>
<tr>
<td>CT (n=14)</td>
<td>50.6 (38-84)*</td>
<td>106.0 (59-140)**</td>
</tr>
</tbody>
</table>

Note: * - p<0.05, ** - p=0.065.

Fig. 3. The ratio of γ-interferon/interleukin-4 content in extracts from tonsils in case of HPT and CT.

Fig. 4. IgA and IgG levels (g/l) in extracts from tonsils in case of hypertrophy and chronic tonsillitis.

From the data in Table II it follows that significant differences between the groups were only in relation to pro-inflammatory IL-1β, the content of which is significantly higher in case of chronic tonsillitis, which according to early research [12] directly indicates the presence of an inflammatory process in the tonsils of children.

IgA and IgG levels in extracts are presented in Figure 4. It can be seen that immunoglobulins A are contained in extracts from HPT and CT at about the same concentration with an unreliable prevalence in extracts from CT (HPT – 0.7 g/l and CT 1.2 g/l). IgG content was significantly higher in tissue extracts of patients with CT (2.0 g/l in case of HPT and 3.6 g/l in case of CT).
DISCUSSION
Our findings indicate that in tissue extracts from tonsils with CT obtained ad mass, there is a predominance of inflammation factors and potential sensitization, as well as the development of immunopathological reactions. The presence of inflammation is indicated by elevated levels of interleukin-1β, immunoglobulin G [13, 3]. High levels of interleukin-4 may indicate that both HPT and CT have a tendency to increase the activity of Th-2 cells, which means that hypertrophy and chronic tonsillitis in children can appear both in the form of sensitization to microbial and other antigens, and in the form of allergic inflammation, as evidenced in the study of cytokine levels in case of other inflammatory processes [11]. Based on the data presented and also taking into account the materials on chronic tonsillitis [2, 3, 4, 14] it may be considered appropriate to set the diagnosis of chronic tonsillitis, as recommended in the ICD-11 project.

CONCLUSIONS
1. The number of immune complexes in chronic tonsillitis is significantly (p<0.05) 1.86 times their number in tonsill hypertrophy.
2. The ratio of γ-IFN and IL-4 is less in case of chronic tonsillitis (0.93) than in case of hypertrophy of palatine tonsils (1.21).
3. The content of pro-inflammatory IL-1β is significantly higher (p<0.05) in case of chronic tonsillitis.
4. IgG contents is significantly 1.8 times higher (p<0.05) in the tissue extracts of the tonsils of patients with CT than with HPT.
5. The content of α-IFN, γ-IFN and IgA of tonsils extracts with hypertrophy and chronic tonsillitis have no significant differences.

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**Conflict of interest:**
The Authors declare no conflict of interest

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**Received:** 17.09.2019
**Accepted:** 10.12.2019

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A — Work concept and design, B — Data collection and analysis, C — Responsibility for statistical analysis, D — Writing the article, E — Critical review, F — Final approval of the article