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Modern Aspects Of Clinical And Laboratory Diagnostics Of Streptococcal Tonsillitis

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Annotation: *Purpose of the study - Examine the clinical and diagnostic features of the to S.pyogenes. Materials and methods. A prospective study of 223 patients with older than 7 years with a diagnosis of acute tonsillitis hospitalized in 2018-2019 to the angin branch Clinical and laboratory data of patients were analyzed. The bacteriological study of the nasopharyal mucus, as well as the immunophromatographic method of the express test ("StreptotestR" France), was carried out with a tonsillite, as well as the immunochromatographic method for determining the β-hemolytic streptococcus group A. Results: From 223 S.pyogenes nasopharyal mucus samples identified in 79 patients, from them bacteriological method S.pyogenes allocated from 53 (23,7%)*

patients, from Staphylococcus aureus 42 (18,8%) of patients, Staphylococcus Aureus + Candida spp at 27 (12,2%) patients, Staphylococcus spp - in 15 (6,7%), Staphylococcus Epidermidis - 12 (5,4%) patients, in 74 (33,2%) of patients received a negative result. The results of the express test during comparative analysis with the results of bacteriological studies have shown that out of 53 patients with S.pyogenes etiology of from the bacteriological examination, streptotest was positive in 47 cases, and in 26 patients the result of streptotest was positive in the absence of S.pyogenes According to the results of bacteriological research.

Conclusion: The widespread use of rapid diagnostic methods, such as express tests, will allow at an early stage to determine the streptococcal etiology of tonsillites and carry out reliable accounting of streptococcal angins. Given the development of various complications after the transfer of Streptococcal Angiin, it is important to study the dissemination issues, the epidemiological characteristics of the pathogen, clinical aspects that will allow to develop effective prevention measures in a timely manner.

Key words: *acute tonsillitis, β-hemolytic streptococcus group A, Streptococcus pyogenes, almonds, express test, streptotest, antibiotic.*

Introduction

Tonsillitis is a disease that accounts for 1.3% of all outpatient visits. Most often, with a viral or bacterial etiology, patients with an uncomplicated course complain of a sore throat. The clinical diagnosis in this case is acute tonsillitis [5].

Inflammation of the larynx is most often observed in children. Streptococcus pyogenes or group A streptococcus (GAS) is the most common bacterial cause of tonsillitis for which antibacterial drugs are prescribed. The use of antibacterial drugs for tonsillitis of streptococcal etiology practically eliminates the development of bacteria in the pharynx and, thus, eliminates the risk of subsequent development of rheumatoid arthritis. In countries with low and middle economic status, as well as crowded groups (for example, in schools, kindergartens), outbreaks of streptococcal tonsillitis are common [1, 8]. Bacterial tonsillitis caused by group A beta-hemolytic streptococcus (GABHS) occurs in 5–15% of adults and 15–30% of patients aged 5 to 15 years [2, 7, 10].

A clinical diagnosis of tonsillitis or pharyngitis of streptococcal etiology or caused by other microorganisms can result from infections of the upper respiratory tract, manifested by sore throat. Inflammation of the larynx, the etiological factor of which is group A β-hemolytic streptococcus, can develop complications such as peritonsillar abscess or invasive infections. In addition, tonsillitis caused by group A streptococcus can also lead to the development of post-streptococcal complications, such as acute post-streptococcal glomerulonephritis, acute rheumatic fever (ARF) and rheumatic heart disease. To date, the data obtained on the global burden of pathologies caused by group A streptococcus have not been sufficiently studied. In 2010, it was estimated that rheumatic heart disease was responsible for more than 345,000 deaths each year1, adding to previous data that invasive group A streptococcal infections caused more than 163,000 deaths2. GABHS is recognized as the fifth microorganism worldwide leading to death. And vaccination against GABHS significantly reduces the incidence of this disease [6, 11].

Prevention and struggle, with this infection, which leads to the development of local and general disorders in the body, is an important task of medicine and today. Angina disease concerns all segments of the population, regardless of age, gender and place of residence.

Purpose of the study - Examine the clinical and diagnostic features of the to *S.pyogenes.*

Materials and methods.

A prospective study of 223 patients with older than 7 years with a diagnosis of acute tonsillitis hospitalized in 2018-2019 to the angin branch of the Andijan region infectious hospital and the Republican Scientific and Practical Center for Epidemiology, Microbiology, Infectious and Health Diseases are held. Clinical and laboratory data of patients were analyzed. The bacteriological study of the nasopharyal mucus, as well as the immunochromatographic method of the express test ("StreptotestR" France), was carried out with a tonsillitis, as well as the immunochromatographic method for determining the β-hemolytic streptococcus group A.

In a clinical examination, anamnesis was collected, a common inspection of the patient. Included hematological studies: general blood test, C-jet protein, ECG, chest radiography.

The smear for bacteriological research was taken before obtaining antibacterial therapy and for 2 hours was transported to the bacteriological department of the clinic. The sensitivity of the isolated pathogens to antimicrobial preparations was carried out by a disc-diffusion method and the results obtained were interpreted according to the standard of the European Committee for Antimicrobial Susceptibility Testing [3].

The immunochromatographic method was applied to identify the β-hemolytic streptococcus group A under the manufacturer's instructions (express diagnostic system Streptatestr, DectraPharm, France) [9].

Statistical data processing was performed using the Microsoft Office Excel 7.0 program, as well as using Statistica 6.0 application packages with the calculation of medium (m) and relative (p) values, their average errors (M), using parametric and non-parametric methods, criterion The reliability of T-Student, with the subsequent determination of the level of reliability of differences. The differences were considered statistically significant at $p < 0.05$.

Results and discussion

In order to identify the peculiarities of the clinical picture of patients with acute tonsillitis infectious diseases hospital, we carried out a comparative assessment of the main clinical syndromes and symptoms, as well as complications of the surveyed patients.

The timing of hospitalization of patients with acute tonsillitis had a decisive impact on the forecast and the outcome of the disease. Thus, in the early hospitalization of patients, in the first day of the disease, the indicators of complicated the course of the disease were reduced, residual manifestations were less developed after the suffering of the disease. When analyzing the timing of hospitalization in the hospital of patients with streptococcal angina, depending on the onset of the disease, it was revealed that on 2 days from the beginning of the disease, 39/49,4% of patients were received, which was statistically reliable ($p < 0,05$) relative to patients who were received before 5 days from the beginning of the disease, which amounted to 21/26,6% of patients and 19/24% of patients were hospitalized by 5 or more days from the beginning of the disease (table №1).

1-table

Terms of admission to the hospital of patients with streptococcal angina depending on the onset of the disease (n=79).

№	Duration of hospitalization	Number of patients % n=79	P
1.	Up to 2 days	49,4%	p<0,05
2.	Up to 5 days	26,6%	p<0,001
3.	> 5 days	24%	p<0,001

From the presented data in the figure, it was established that a significant meaning of patients with streptococcal tonsillitis came in the first days of the disease, 1-2 days of the disease, which is apparently associated with acute disease, with high body temperature, sore throat and intoxication. All patients have a manifestation of general intoxication, patients had complaints about lethargy, weakness, drowsiness, adamise, disruption of appetite, capriciousness.

According to epidemiological history of 35 (44,3%) patients with streptococcal angina, they associated their disease with the use of cold beverages, 23 (29,11%) patients were in contact with patients who transferred sore throat and 21 (26,58%) of patients What did not associate their illness. According to the nature of the local process, the catarrhal angina (45,6%) patients and follicular sore throat (45,6%) patients were mainly diagnosed more often, and lacunar angina (7,6%) patients were diagnosed. Fibrin-necrotic districts are diagnosed in 1 patient (1,26%).

In order to determine the etiological agent, microbiological and immunochromatographic research was carried out. From 223 *S.pyogenes* nasopharyal mucus samples identified in 79 patients, from them bacteriological method *S.pyogenes* allocated from 53 (23,7%) patients, from *Staphylococcus aureus* 42 (18,8%) of patients, *Staphylococcus Aureus* + *Candida spp* at 27 (12,2%) patients, *Staphylococcus spp* - in 15 (6,7%), *Staphylococcus Epidermidis* - 12 (5,4%) patients, in 74 (33,2%) of patients received a negative result.

Also analyzed the frequency of *S.pyogenes* detection depending on the season. Thus, the highest frequency of *S.pyogenes* detection in patients in our study was noted in the spring months of the year (March - May) (38/43.3%) of cases, in the winter period the number of cases was 14/17.7%, in the autumn 22 / 27.84% of cases and in the summer months of 5 / 6.32% of cases. Analysis of the frequency of step -ococcal angine, depending on the season, showed that the hospitalization of patients is characterized by an increase in the number of cases of diseases during the spring. As can be seen from (table №2). Lifts of morbidity were observed in certain months.

2-table

Meeting frequency of streptococcal tonsillitis during the year (n = 223)

№	**Months**	**AT + *S.pyogenes* n=79**	**All cases of AT n=223**
1	January	3,1%	55,7%
2	February	7,6%	24,5%
3	March	10,12%	29%

4	April	12,7%	40,1%
5	May	25,3%	64,6%
6	June	2,23%	1,3%
7	July	0%	0%
8	August	5,1%	15,6%
9	September	6,32%	20%
10	October	10,12%	73,6%
11	November	11%	24%
12	December	6,32%	11,2%

When comparing the data obtained in our study with data from other studies, it was noted that the long-term dynamics of sharp tonsillitis shows a significant rise in the period from September to March, with two peaks of morbidity - in September and January, and in the summer, the incidence is significantly reduced with a minimum in June which is limited to the influence of natural climatic factors [4].

In addition to bacteriological research, an immunochromatographic test - express test (Streptotest) was used, which increased the etiological decoding of sharp tonsillitis.

The results of the express test during comparative analysis with the results of bacteriological studies have shown that out of 53 patients with *S.pyogenes* etiology of from the bacteriological examination, streptotest was positive in 47 cases, and in 26 patients the result of streptotest was positive in the absence of *S.pyogenes* According to the results of bacteriological research.

The clinical picture of streptococcal angins in all examined patients (79/100%) was characterized by acute principle with an increase in body temperature, throat pain, increasing intoxication, such as loss, headache, weakness, loss of appetite. The main clinical sign in patients was pain in the throat, which in 11 (14%) patients spread to the neck, temple, ears. In case of inspection, 46 (58,2%) of patients noted an increase and soreness of submandibular lymph nodes. Also complaints about pain in the joints, stiffness in the morning was observed in 32 (40,5%) patients, also 19 (35,8%) patients noted cough.

The indicators of the hemogram of the surveyed patients were also analyzed. Thus, hematological data was characterized by leukocytosis, which had a direct dependence on the form of gravity and the presence of complications, so the level of leukocytes in 63 (79,7%) patients exceeded > 10.0x10 9/l from the first days of the disease, an increase in EEE (48/60, 7%) and the level of C-reactive protein (14/17.7%).

In the course of observation of patients with streptococcal angina, additional research conducted according to the testimony made it possible to identify various complications. So, a smooth, non-complicated course of the disease was observed in 56 (70.8%) patients, they did not have peculiar complications after a decrease in temperature to normal numbers and the disappearance of symptoms of intoxication. In the 23rd (29,2%) patients noted the nasty course of acute tonsillitis, the cause of which was lymphadenitis, pyelonephritis, myocarditis, pneumonia, sepsis. So, out of 79 (100%) of patients from which *S.pyogenes* was

allocated. Complications were noted in 23 (29,1%) patients. Complications appeared in the form of myocarditis (4/5%), pyelonephritis (8/10,1%), pneumonia (7/8,8%), lymphadenitis (3/3,8%) in the 1st (1,2%) The case of a patient with a toxic form from the development of sepsis was observed.

In connection with the relevance of the burden of Streptococcal

Conclusion.

To date, in order to establish the role of *S. pyogenes* in the development of sharp tonsillitis, the laboratory diagnostic service of therapeutic institutions should be actively developing. The widespread use of rapid diagnostic methods, such as express tests, will allow at an early stage to determine the streptococcal etiology of tonsillitis and carry out reliable accounting of streptococcal angins. Given the development of various complications after the transfer of Streptococcal angin, it is important to study the dissemination issues, the epidemiological characteristics of the pathogen, clinical aspects that will allow to develop effective prevention measures in a timely manner.

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