

## Tonsillities – symptoms, causes and diagnosis

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### Abstract

Diseases of the throat and tonsils are one of the most frequent causes of patient visits to pediatricians and family doctors. It should be emphasized that to protect the vast majority of them, symptomatic management is sufficient. When applying for pharmacological interventions, the physician should be guided by experience, while supporting himself with objective scientific data confirming the effectiveness of the recommended treatment. It is worth emphasizing the necessity to implement the vaccination calendar as a proven effective method of protecting patients from serious complications of infectious diseases.

**Keywords:** *tonsillities; Centor's scale; Streptococcus; angina Plauta-Vincenta; angina herpetic; mononucleosis; scarlet fever; diphtheria; syphilis*

### Admission

The pharyngeal tonsil and palatine tonsils are clusters of lymphoid tissue associated with mucous membranes (so-called MALT - mucosa-associated lymphoid tissue) and together with other structures such as tubal tonsils, lateral lymph nodes and lymphoid papules, they form the so-called Waldeyer's ring - the accumulation of lympho-epithelial tissues that form the mucosal immune system of the throat. Lymphoid tissue from which the palatine tonsils and the pharyngeal tonsil are made plays an important role in immune defense, creating a barrier for antigens that penetrate the human body. Arranged at the crossroads of the digestive system and the respiratory tract, the tonsils are exposed to the influence of external factors during the processes of speaking, chewing, swallowing and breathing. [17,18]

### Couses and types of tonsillities

Tonsillitis can be distinguished due to the etiological factor: viral, bacterial, fungal or allergic inflammations, or due to the nature of the immune response - specific and non-specific inflammation. The most common inflammatory agents are viral infections caused by adenoviruses, rhinoviruses, Cocksackie viruses, and Epstein-Barr virus (EBV). The most common bacterial agents are: Beta-

hemolytic Streptococcus mainly from group A, but also from group C and G, Haemophilus influenzae, Moraxella catarrhalis, Fusobacterium necrophorum. Candida albicans dominates among the fungi. [14, 18]

### Acute tonsilitis

There are an acute throat inflammation and acute palatine tonsil inflammation, called angina. Most of this type of infection has a viral etiology. According to various authors, between 5% and 30% of acute throat inflammations in adults are bacterial. These are mainly infections with beta-hemolytic streptococcal type A (group A of beta-haemoliticus streptococci- GABHS). About 10% of acute bacterial throat inflammations correspond to group C and G streptococci.

The reservoir and source of GABHS infection is a sick man (rarely asymptomatic vector). Infection occurs by droplet or direct contact (including the upper respiratory tract). The asymptomatic carriers of GABHS are frequent.

The period of lodging of streptococcal inflammation (GABHS) ranges from 12 hours to 4 days. The period of infectivity 24 hours from the beginning of effective antibiotic therapy or about 7 days after the disappearance of symptoms when the antibiotic was not used. The risk of transmission of infection to household members is around 25%.

The clinical picture characteristic of GABHS is a sudden onset, severe sore throat, headache, sometimes abdominal pain, nausea and vomiting (rather in children); fever ( $> 38^{\circ}C$ ), pharyngitis and palatine tonsilitis (blood-red or blood-red mucous membrane, edema), clearly-defined clusters of exudate on the tonsils, blood-red and swollen palatine uvula, initially coated, later "raspberry" tongue, ecchymosis on the mucosa of the palate. Furthermore, there are tender, enlarged cervical lymph nodes (enlarged carotid neck junctions indicate viral etiology) but there is no cough and rhinitis.

Certain diagnosis or exclusion of GABHS infection based on the clinical picture is not possible. Clinical and epidemiological criteria are useful in identifying patients who are at high or low risk to have a GABHS etiology. It is crucial to determine if antibiotic treatment is necessary.

Grading helpful and used both in children and adults in the diagnosis of GABHS infection is modified Centor's scale. It is based on 4 criteria: coating or enlargement of palatine tonsils, enlarged and painful lymph nodes of the neck, temperature  $> 38^{\circ}C$  and lack of cough. In modifying the Centor scale proposed by McIsaac, the patient's age was divided into 3 periods: 3-14 years, 15-44 years and 45 years and above. Depending on the number of points obtained, the patient is assigned to the risk group. Low risk group (0-1 points) is recommended to use only symptomatic treatment, and there is no bacteriological diagnosis needed. Medium risk group (2-3 points) is recommended to perform a "quick" test for the presence of *S. pyogenes* antigen (if inaccessible, a smears from the throat should be performed); decision about treatment depending on the result. High risk group ( $\geq 4$  points): if symptoms are intensified - order an antibiotic, if there are mild-- perform a "fast" test for the presence of *S. pyogenes* antigen (if inaccessible, a throat swab should be performed) and decision about treatment depending on the result. [2,3,9,10,15]

Criteria	Score
Temperature $> 38^{\circ}C$	1
Absence of cough	1
Tender or swollen lateral cervical lymph nodes	1
Tonsillar exudate	1
Age 3-14 years	1
Age 15-44 years	0
Age $> 45$ years	-1

### First-line treatment in GABHS:

*Phenoxyloypenicillin* (V) in adults: 2.0-3.0 million IU/ day, divided every 12 hours; in children: 100,000-200,000 IU/kg/day, divided every 12 hours, or

*Cefadroxil* adults: 1.0g/day divided every 12-24 hours; children: 30mg/kg/day, divided every 12 hours, or

*Cefalexin* adults: 0.5-1.0g every 6-8 hours; children 50-75 mg/kg/day divided every 8 hours, or

*Makrolid* indicated as an I-drug only when hypersensitivity to beta lactams (in patients with immediate allergy to penicillins and cephalosporins).

Second-line treatment:

*Clindamycin* - adults: 300mg every 8 hours. (maximum 1.8 g/day); children (<40kg): 20-30mg/kg/day divided every 8 hours.

Third-line drug:

*Amoxicillin/clavulanate* - adults 500/125mg every 12 hours or 875/125mg every 12 hours; children 80-90/6.4 mg/kg/day, divided every 12 hours [16]

Complications in streptococcal inflammation:

- purulent (early) complications - periparasal abscess, purulent cervical lymphadenitis, purulent otitis media and/or mastoiditis, purulent inflammation of the paranasal sinuses,
- late immunological complications (very rarely in adults) - rheumatic fever, acute glomerulonephritis
- other (rare) - bacteraemia, pneumonia, meningitis. [24]

### **Angina Plauta-Vincenta**

It is a disease caused mainly by *Treponema vincenti*, *Fusobacterium nucleatum*, *Borrelia vincenti*. There is a unilateral, ulcerative-membranous palatine tonsillitis. The coating may spread in the direction of the palate, the mucous membrane of the cheek or gums. On the same side, enlarged lymph nodes are found. There is a typical oral stigma (fedor ex ore). The patient usually reports one-sided pain when swallowing. Local lesions are usually very severe, as opposed to general symptoms, which are often mild. Usually there is no fever. The prognosis in this disease is good. The diagnosis is based on a swab from the change. Differential diagnosis should include diphtheria, infectious mononucleosis, tuberculosis, syphilis, agranulocytosis, acute leukemia, tonsil cancer. Penicillin (first-line drug), cephalosporins, tetracycline and clindamycin are used in the treatment. Topping is applied with 20% silver nitrate solution or 5% chromic acid. [1,18]

### **Angina agranulocytotica**

It is an acute lymphatic pharyngitis in people with a deficiency or lack of neutrophils. The clinical picture is dominated by severe sore throat, fedor from the mouth, accompanied by fever. There are local ulcers with necrosis on the tonsils, which may also occur on the mucous membrane of the throat and gums. Lymphadenopathy is not observed. The diagnosis is determined by the clinical picture and biochemical examination of the blood smear. It is typical for this disease that there are no abnormal leukocytes, erythrocytes or platelets in the blood count. After the diagnosis of the disease, the patient should be transferred to the care of a hematologist. [18, 20, 21]

### **Angina herpetica**

The disease is caused by the Coxackie A virus, less frequently the B group, retroviruses or echovirus. The incubation period is 4-6 days. It usually occurs in children up to 15 years of age. This disease causes pronounced general symptoms such as high temperature, neck pain, headaches, loss of appetite. Initially, bubbles form on the palatal arches. The tonsils are usually slightly red and enlarged, sometimes covered with milky white vesicles or small flat ulcerations are observed. Similar changes may appear on the palate or mucous membrane of the cheek. The course of the disease is mild. Symptomatic treatment is recommended. [19]

### **Mononucleosis**

Mononucleosis is caused by the Epstein-Barr virus (Epstein-Barr virus - EBV). In adolescents and young adult infection with EBV virus in about 70% leads to the development of the disease and can have a serious course. In small children, it generally runs subclinically. The EBV virus is mainly transmitted by saliva. It is also possible to infect via objects and by droplet. The virus incubation period is 4-8 weeks.

The clinical picture has a temperature above 38.0 °C, weakness, inflammation of the throat, enlarged lymph nodes most often around the head and neck, but generalized lymphadenopathy may occur. Occupation of the posterior cervical nodes also allows distinguishing EBV infection from streptococcus infection or other microorganisms. There is enlargement of the liver and spleen. The

picture of the throat is varied with enlarged palatal tonsils and congested arches as well as with fibrous flares that cover the entire Waldeyer ring tissue. Coating on the tonsils last for about 2 weeks. Symptoms of the disease in young children are shorter, but hepatosplenomegaly is more often observed, we can observe swelling of the eyelids and rash similar to that occurring in scarlet or rubella. Diagnosis is based on the clinical picture and additional tests, including blood counts, where leukocytosis occurs, and atypical lymphocytes (10-70%). Additional tests often show increased ALT, AST, GGTP, ALP. Bilirubin concentration may also be increased. Differential diagnosis should include Plain-Vincent angina, diphtheria, scarlet fever, syphilis, rubella, toxoplasmosis, listeriosis, tularemia, Hodgkin's disease, leukemia. Treatment is symptomatic. Antibiotics are implemented when bacterial superinfection is diagnosed. In most cases, this is an infection caused by anaerobic bacteria, therefore Metronidazole is recommended in this group of patients. In most cases, recovery occurs within 2-3 weeks. In children, the course of the disease is usually lighter than in adults. Relief of disease symptoms is not equivalent to the elimination of a virus that can remain in the body in the state of latency and temporarily be replicated and be present in saliva. [5,11,22,23]

### **Scarlet fever**

Scarlet fever is an infectious disease caused by beta-hemolytic streptococcal type A (*Streptococcus pyogenes*). The infection takes place in a droplet path. The incubation period is 2-5 days. There is a fever, a sore throat. A topical examination reveals a vivid red color of the pharyngeal mucous membrane and palatine tonsils in which crypt tonsillitis (angina lacunaris) develops. About 24 hours after the onset of the first symptoms of the disease appears rash, initially the upper half of the body, then also elbow and popliteal flexion and on the buttocks. The face is often erythema, however, the skin around the lips is pale – it is called Filatowa's triangle. At the same time, rashes appear on the tongue with the rash - so-called raspberry language. After a few days of the disease, there is a flaky scaling of the skin on the hands and feet - a characteristic sign of scarlet fever. The complication of scarlet fever may be arthritis, rheumatic fever, glomerulonephritis, and even death in septic form. Diagnosis is based on a typical clinical picture and a throat swab (confirmed presence of group A streptococcus). Differential diagnosis should include scarlet, measles, rubella and Kawasaki disease. Blood biochemistry shows leucocytosis, elevated streptolysin (ASO), elevated CRP. The first-line treatment is Penicillin [4,7,8,13]

### **Diphtheria**

Diphtheria is an infectious disease caused by *Corynebacterium diphtheriae*. In countries where compulsory vaccinations are carried out, diphtheria has virtually been eliminated. Cases of this disease, however, continue to be reported in Africa, South America, Asia, the Middle East and Eastern Europe. The disease is spread mainly by droplets. The incubation time is on average 2-5 days. In the clinical picture of diphtheria there is a sore throat, difficulty in swallowing, enlargement of regional lymph nodes. Within the epithelium of the throat, tonsils, larynx and trachea we can observe gray diphtheria, which is characteristic when trying to separate it easily bleeds. When diphtheria bloating narrows the light of the airways it can lead to impaired breathing and even death of the sufferer due to suffocation. Body temperature generally does not exceed 38 ° C, which distinguishes this unit from streptococcal angina. Diagnosis is based on clinical symptoms and is confirmed by a nasal and throat swab. The basis of treatment is immediate administration of diphtheria antitoxin. Antibiotic therapy plays a secondary role. The patient should be hospitalized because complications in the course of diphtheria can be serious and affect many organs. Diphtheria toxicity is associated with its ability to produce a toxin that inhibits protein synthesis in the target cell. The toxin penetrates into the blood and can lead to damage to the myocardium, hemorrhagic nephritis, and paralysis of the palate in the course of polyneuritis. In prophylaxis, protective vaccination is very important. For people in countries where diphtheria is still present, booster vaccinations are recommended every 10 years. [6, 12]

### **Tonsillitis in syphilis**

All stages of syphilis can manifest in the oral part of the throat. After about 3 weeks, the primary symptom appears on the lips, mucous membrane of the cheek, tonsils or tongue. A typical primary ulcer is painless, it has a follicular character, and over time it transforms into an ulcer. The surrounding lymph nodes are enlarged. About 6 weeks after infection of the tonsils, palatal arches and soft palate a white, turbid mucous rash (opalescent spots) appears. The hard palate is usually free of

changes. Then the rash turns into dark red clots. Stage 2 infections are usually present in other parts of the body. Syphilis stage 3 appears after 20-30 years. In differential diagnosis, any sore in the oral part of the throat should arouse the suspicion, especially when it involves the soft palate and the tongue. The diagnosis confirms the examination of microorganisms from primary change and serological tests. Treatment consists of Penicillin G. [19]

## Conclusion

Diseases of the throat and tonsils are one of the most frequent causes of patient visits to pediatricians and family doctors. It should be emphasized that to protect the vast majority of them, symptomatic management is sufficient. When applying for pharmacological interventions, the physician should be guided by experience, while supporting himself with objective scientific data confirming the effectiveness of the recommended treatment. It is worth emphasizing the necessity to implement the vaccination calendar as a proven effective method of protecting patients from serious complications of infectious diseases.

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