PATHOPHYFIOLOGY AND ETIOLOGY OF ADENOTONSILLITIS IN CHILDREN

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Annotation: Adenotonsillitis in children is a combined inflammation of the pharyngeal and palatine tonsils, which is acute or chronic. The disease occurs under the influence of pathogenic viruses and bacteria in the presence of risk factors: decreased immune defense, allergies, and inflammatory processes in the oral cavity. The main symptoms of adenotonsillitis are difficulty in nasal breathing, nasal voice, snoring at night, sore throat and paroxysmal cough. Diagnosis includes rhinoscopy, pharyngoscopy, and bacteriological examination of smears. Treatment is carried out conservatively (antibiotics, tonsillectomy, physiotherapy), if it is ineffective, removal of tonsils is indicated.
Key words: adenotonsillitis, antibiotics, tonsillectomy, physiotherapy.

Specialists in practical pediatrics and pediatric otorhinolaryngology regularly face the problem of adenotonsillitis in children. The true prevalence of the problem has not been established, since the term "adenotonsillitis" itself is not widely used when making a diagnosis. Often, the patient's chart indicates the predominant problem – tonsillitis or adenoids, sometimes both diagnoses at once. According to various sources, the frequency of adenotonsillitis is 10-63%, and the disease occupies at least a quarter of cases of all inflammatory processes in the ENT organs in children.

There are no specific pathogens of adenotonsillitis in children, so in practical medicine, disputes about the main etiological factors do not subside. A number of authors put viral infection in the first place: representatives of SARS, entero-Epstein-Barr virus. Other specialists prefer bacterial flora: staphylococci (21-75%), hemophilic bacillus (5-66.7%), pneumococci (18-50%). Microbial associations are often identified.

The most important role in the development of the disease is played by predisposing conditions that promote the reproduction of microorganisms and colonization of the mucous membranes. The risk of adenotonsillitis in children increases significantly under the influence of the following risk factors:

- Frequent acute respiratory viral infections. In the group of frequently ill children who suffer more than 4 episodes of colds per year, the prevalence of pathology reaches 43%, which is 2 times higher than the average in the population.
- Female gender. Data from various scientific studies show a predominance of girls over boys in the ratio from 1.5: 1 to 2.6:1. The increased frequency of chronic adenotonsillitis in adolescent girls is explained by the effects of estrogens and a tendency to hyperimmune conditions.
- Allergic reactions. About 20-30% of pediatric patients with allergies have enlarged tonsils, a tendency to infectious and inflammatory diseases of the lymphoid tissue and concomitant disorders of nasal breathing.
- Dental diseases. Carious teeth, stomatitis and other inflammatory processes serve as a constant source of infection that spreads to the tonsils, disrupts the functions of local immunity in the oral cavity.
- Exogenous factors. Hypothermia, increased physical and mental stress, and severe stress are triggers for a decrease in the body's defenses and the development of inflammatory processes, including adenotonsillitis in children. The likelihood of the disease increases with hypovitaminosis, unbalanced nutrition.

Pathogenesis

The tonsils belong to the NALT system, a lymphoid tissue associated with the nasopharynx, which is one of the components of the extensive MALT system. They serve as a barrier against pathogenic microorganisms entering the respiratory tract and provide a zone of primary interaction with foreign influences. The main function of immunocompetent cells is the formation of different classes of antibodies that respond to the action of various antigens.

Combined inflammation of lymphoid formations in the upper respiratory tract is a typical situation for children. Young patients have immaturity of the immune system, primarily its local link and the production of secretory IgA, which contributes to the rapid occurrence and generalization of inflammation. The action of microbial antigens causes a standard immune response in different structures of the Pirogov-Waldeyer lymphoepithelial ring.

In most cases, the main manifestation of the disease is frequent colds, which occur with a runny nose, nasal congestion, sore throat and a superficial cough. A distinctive sign of the defeat of the tonsils is an intense sore throat, which increases when swallowing, talking. However, in young children, it is difficult to distinguish between typical acute respiratory infections and adenotonsillitis, since they are not able to clearly describe their complaints.

The disease is accompanied by general and local signs of inflammation. When examining a child's throat, parents may notice redness, swelling, pustules, or plaque on the tonsils. The general symptoms of adenotonsillitis are caused by intoxication syndrome and include fever, lack of appetite, weakness and malaise. Some children complain of headaches and muscle aches. Irritability, emotional instability, and tearfulness are also characteristic.

Adenotonsillitis in children is accompanied by hypertrophy of the palatine tonsils, which causes difficulty breathing and swallowing, reflex coughing, and loud snoring. An increase in adenoids is manifested by nasal breathing disorders, which is why the child constantly walks with his mouth slightly open. Over time, an "adenoid" puffy face with smooth nasolabial folds is formed. Nasal congestion causes a nasal voice, difficulties in pronouncing consonant nasal sounds.

COMPLICATIONS

One of the most dangerous complications of adenotonsillitis is obstructive sleep apnea (OSA), which occurs due to the airway being blocked by enlarged tonsils. Every night, the child has many short-term respiratory stops, which cause oxygen starvation and problems in the work of the cardiovascular system. Frequent half-awakenings do not allow you to fully rest, they cause constant daytime sleepiness.

When mucosal secretions enter the oropharynx and laryngopharynx, a syndrome of postnasal congestion is formed, which is characterized by a painful paroxysmal cough. Most often, it occurs at night, and in the morning immediately after waking up, because mucus is easier to get into the throat in a horizontal position of the body. The inflammatory process in the lymphoid structures of the pharynx often spreads to neighboring ENT organs and is accompanied by rhinitis, sinusitis, and otitis media.

Adenotonsillitis in children is a serious danger due to the development of chronic hypoxia. Lack of oxygen in the brain causes blood flow disorders, disorders of neuropsychiatric functions, and difficulties in performing intellectual tasks. Many patients with chronic inflammatory processes in the tonsils face memory loss, inability to concentrate for a long time, and slow thinking.

DIAGNOSTICS

Examination of a child with suspected adenotonsillitis is performed by a pediatrician or a pediatric ENT doctor. When collecting anamnesis, special attention is paid to the frequency of acute respiratory infections, the presence of allergic diseases. Diagnosis based on physical signs is difficult, especially in young patients, which is explained by age-related nuances of

the nasopharynx and oropharynx structure. Instrumental and laboratory research methods, such as::

- Rhinoscopy. Examination of the nasal cavity with special instruments is the main way to detect enlarged and inflamed tonsils that indicate the presence of adenotonsillitis. Anterior rhinoscopy is performed in children of any age, posterior-in the older age group. At the present stage of otorhinolaryngology, nasal endoscopy is used as the most informative method.
- Pharyngoscopy. The study is necessary to visualize edematous palatine tonsils that protrude beyond the edges of the arches. Lymphoid structures have a bright pink color and a loosened surface. With a bacterial cause of adenotonsillitis, liquid pus or caseous-purulent plugs in the lacunae are determined. Thickening and hyperemia of the anterior edges of the palato-lingual arches is also characteristic.
- Additional instrumental methods. To exclude complications from ENT organs, radiography of the paranasal sinuses, otoscopy, and dental examination are prescribed. Since tonsillitis is often complicated by cardiological pathology, children perform an ECG. If a lesion of the lower respiratory tract is suspected, an X-ray of the chest organs is performed.
- Laboratory diagnostics. To clarify the cause of inflammation, a bacteriological culture of discharge from the surface of the tonsils, a pharyngeal smear for BL (diphtheria) is prescribed. To assess the general condition of the child and the severity of the disease, perform a clinical blood test, a general urinalysis, and a biochemical blood test.

Differential diagnosis

Adenotonsillitis has similar clinical symptoms with infectious mononucleosis, neoplasms of the tonsils, pharyngomycosis, and pharyngeal tumors. The criteria for differential diagnosis are signs of active inflammation, bilateral nature of the lesion, moderate enlargement of the cervical lymph nodes. If catarrhal inflammation and edema predominate, allergic rhinitis and rhinosinusitis should be excluded.

In the period of exacerbation of the disease, the patient needs a half-bed regime with limited physical activity, a gentle diet, and a plentiful warm drink. With the bacterial nature of the disease, antibiotics are prescribed, which are selected empirically and dosed according to the weight of the child. To eliminate the symptoms of adenotonsillitis, antipyretics and painkillers are used. To improve breathing, vasoconstrictor nasal drops are prescribed in short courses.

To clear the focus of inflammation from the accumulation of mucopurulent secretions and pathological microorganisms, hydrovacuum washing of the tonsils, nasal shower, gargling is indicated. In addition to standard medical therapy for chronic forms of adenotonsillitis in children, physiotherapy is used. Ultraviolet radiation, UHF, ultrasound therapy, and magnetic field therapy demonstrate a good effect.

Surgical treatment

Surgical interventions are performed when conservative tactics are ineffective, palatine tonsils and adenoids are significantly enlarged in children, and there are signs of complications (OSA, persistent nasal congestion, frequent otitis media and sinusitis). The main types of surgery are tonsillectomy and adenotomy. In pediatric practice, minimally invasive techniques for removing tonsils using laser energy, radiofrequency ablation, and diathermocoagulation are widely used.

PROGNOSIS AND PREVENTION

With timely diagnosis and selection of therapy, it is possible to completely cure acute adenotonsillitis, prevent relapses of the chronic form of the disease. Gentle methods of surgical treatment make it possible to cope with advanced cases without significant tissue injury, bleeding and complex rehabilitation. Prevention of the disease involves strengthening the immune system, timely vaccination, and elimination of modifiable risk factors.

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