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## OTOMYCOSIS AND OTHER FUNGAL INFECTIONS OF THE ENT ORGANS

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**Resume.** Mushrooms surround a person everywhere. They are found in air, water, soil and food. Their functions are diverse and their role in nature and human life is great: some mushrooms are eaten, others are widely used in the food industry (cheese, wine production), and still others can cause disease.

The causative agents of mycoses of the ENT organs are opportunistic fungi. Irrational antibiotic therapy, the use of drugs that suppress immunity, the presence of malignant neoplasms, chronic processes and immunodeficiency states, the complexity of laboratory diagnosis of mycoses, etc. can be attributed to the factors that contribute to the growth of mycoses. Mycogenic allergy plays a certain role in the pathogenesis of mycoses.

**Key words:** otomycosis, fungal lesions, ENT organs, symptoms, diagnosis, treatment.

Today, more than 500,000 species of microscopic fungi are known, and only about 50 of them are pathogenic for humans. According to the WHO, 1/5 of the world's population has a fungal pathology. The increase in the incidence of mycoses is primarily associated with a decrease in the body's immunological resistance, caused by environmental pollution, the unjustified and long-term use of antibacterial drugs that disrupt the microbiocenosis of the body, as well as corticosteroids and immunosuppressants.

Human pathogenic fungi can be divided into two groups: primary pathogens and opportunistic pathogens. Primary pathogens (*Coccidioides immitis*, *Histoplasma capsulatum*, *Sporothrix schenckii*, *Blastomyces dermatitidis*) can cause disease in a healthy person, while opportunistic pathogens (*Candida* spp., *Aspergillus* spp., *Cryptococcus neoformans*, *Penicillium* spp., *Trichosporon beigeli*) are usually harmless to healthy people and become pathogenic only in the event of a decrease in immunological resistance. Conditionally pathogenic fungi (OPF) are capable of long-term contact with the skin and mucous membranes of a person without signs of pathological changes, which are revealed only in the event of the action of additional factors that suppress local and systemic protective mechanisms.

Among the causative agents of otomycosis, fungi of the genus *Aspergillus* predominate, followed by *Sandida*. The main complaint of a patient with mycosis of the external auditory canal is itching. The external auditory canal is narrowed due to the infiltration of the skin, which is covered with exfoliated scales of the epidermis. There may be discharge from the ear, the color of which depends on the causative agent: black, yellowish-green, gray-black, in the form of caseous masses (*Aspergillus*); gray (*Mucor*) and others.

Some of these types of fungi can live on the surface of the human skin without causing any symptoms or health problems, but when the circumstances coincide, conditions arise in which the fungi can actively multiply and cause inflammatory skin reactions.



**Otomycosis** (fungal otitis, otitis of fungal etiology) - most often, these names mean an inflammatory disease of the skin of the external auditory canal, which is caused by various types of parasitic fungi. Fungal diseases of the tympanic membrane, the middle ear, and the postoperative ear cavity are also encountered in the practice of an ENT doctor, but the most common is a fungal infection of the outer ear itself.

### **SYMPTOMS OF OTOMYCOSIS**

How can you suspect the presence of a fungal infection in the ear:

- feeling of blockage or foreign object in the ear;
- distension, feeling of fullness in the ear;
- itching in the ears;
- sometimes a burning sensation in the external auditory canal;
- appearance of secretions from the ear with an unpleasant smell;
- peeling of the skin in the ears.

### **CAUSES OF FUNGUS IN THE EARS**

Factors contributing to the occurrence of otomycosis:

- violation of external auditory canal hygiene;
- foreign bodies in the external ear (for example, a sulfur plug);
- long-term use of vacuum headphones, endaural hearing aids and their inserts;
- absence of earwax or its small amount;
- chronic purulent otitis media;
- anatomical features of the auditory canal (for example, exostoses);
- long-term use of antibacterial drugs (both locally and systemically);
- presence of allergic diseases;
- long-term use of drugs affecting the immune system (cytostatics, corticosteroids, etc.);
- immunodeficiency conditions (HIV infection, diabetes, autoimmune and oncological diseases);
- working conditions that require a long stay in conditions of high humidity or dusty air.

The clinical picture of mycotic otitis media is characterized by the presence of periodic significant secretions from the ear, intense noise in the ears. The sudden appearance of these phenomena against the background of a relatively calm otitis course is characteristic. There are several perforations of the tympanic membrane and attachment of otitis externa.

### **DIAGNOSIS OF OTOMYCOSIS**

As with any other pathology of the organ of hearing, the diagnosis of fungal otitis first requires a physical examination of the patient. During the examination of the external auditory canal, the otolaryngologist will determine the degree of damage to the ear, find out the probable causative agent of otomycosis based on characteristic signs, and will be able to conduct a toilet of the external ear, which is an important stage in the treatment of otitis externa.

Also, in the diagnosis of otomycosis, a bacteriological examination of discharge or smear from the ear is advisable. Most often, other methods of hearing analyzer research are not needed in this pathology.

In the case of recurrent otomycosis, it may be necessary to examine the patient



for other diseases that may create favorable conditions for the occurrence and repetition of episodes of otomycosis.

### TREATMENT OF OTOMYCOSIS

The main stages of treatment of otomycosis:

- toilet of the external auditory canal, removal of epithelial and fungal masses, which will speed up recovery and make treatment with medicines more effective;
- local application of antifungal drops - dosage, mode of use and duration of treatment are determined by the doctor, based on the activity and prevalence of the inflammatory process;
- if necessary - systemic antifungal drugs, which are also prescribed by the doctor - determines the group of antifungal drugs, the duration and mode of administration;
- limitation/exclusion of factors affecting the development of otomycosis - swimming, working in humid rooms, correction of concomitant diseases (allergy, diabetes).

Among the *pharyngomycoses*, candidiasis of the oropharyngeal mucosa ("thrush") is the most common. The process is localized mainly on the palatine tonsils in the form of whitish plaques.

**Pharyngomycosis** is not a highly contagious disease. Most often, inflammation of the mucous membranes, caused by fungi of the genus *Candida*, is secondary. Depending on the degree of damage, pseudo-membranous, hyperplastic, granulose, and erosive-ulcerative clinical forms of pharyngomycosis are recognized.

A direct connection has been established between the use of modern antibacterial drugs in doses that exceed therapeutic doses and the development of pharyngomycosis. It is also necessary to take into account the independent treatment of diseases of the pharynx and improper care of dental prostheses.

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Mycosis and severe somatic diseases provoke the development of mycosis, for example, diabetes, blood diseases, malignant neoplasms, bronchial asthma.

Secondary immunodeficiency, which develops not only against the background of HIV infection, but also with long-term use of corticosteroids in a dose exceeding 0.5 mg/kg/day for 28 days, or a second long-term immunosuppressive therapy significantly increases the risk of developing superficial mycosis. Staying in intensive care and intensive care units for more than 10 days, long incubation of the trachea, and infrequent tracheostomy tube changes significantly contribute to the development of mitotic lesions of the pharynx and larynx.

*Mycoses of the paranasal sinuses* are divided into two forms according to the nature of the lesion: non-invasive and invasive. The non-invasive form is a mycetoma (fungal body), in which the process is localized mainly in the mucous membrane. In this case, the symptoms of chronic inflammation of the paranasal sinuses are usually noted, but they are more pronounced. Mycetoma is most often caused by fungi of the



genus *Aspergillus*, but can also be *Fumigatus*, *Candida*, *Alternaria*, *Virlaris*. The most frequent localization of mycetoma is the maxillary sinus. The leading role in the etiology of its occurrence is the presence of filling material in the sinus, which got there through the canals of the teeth of the upper jaw. The content of zinc salts in the filling material plays a catalytic role in the development of fungal flora. The clinic of mycetoma of the maxillary sinus resembles chronic purulent sinusitis, but it can also have an asymptomatic course. Radiologically, a mycetoma in the nasal sinuses has a metal density, because calcium salts are deposited during the vital activity of the fungus. In the case of an invasive form, or deep mycosis, the process spreads to the periosteum and bone. The deep form is more often caused by yeast and mold fungi. The disease is characterized by a feeling of pressure or a foreign body in the sinus. X-ray reveals cloud-like darkening of the affected sinus.

In case of *polypous rhinosinusitis*, various representatives of the fungal mycoflora, such as *Aspergillus*, *Clatosporium*, *Dematiassons*, *Histoplasma*, are detected in 85% of polyp tissue sections. Not only the mushrooms themselves, but also the products of their vital activity can lead to sensitization of the body, which significantly worsens the course of the disease and requires the use of additional measures aimed at desensitizing the body.

*Mycotic laryngitis* is divided into three main forms: catarrhal-membranous, atrophic and infiltrative. Symptoms of the disease may include hoarseness, pain when swallowing, cough, and throat itching.

**Treatment** of mycoses of the ENT organs includes general and local antimycotic therapy. General antimycotic therapy is used only in case of a severe course of the disease, it includes the use of such drugs as fluconazole, amphotericin B, intraconazole, terbinafine, ketoconazole. Preference is given to the use of local antimycotic drugs, such as nitrofungin, canecten (clotrimazole), amphotericin B, nizoral, diflucan, exoderyl and others. With fungal sinusitis, the maxillary sinuses are punctuated with the introduction of an antifungal drug solution into them. Treatment of mycetoma of the maxillary sinus is surgical. During the subsequent pathohistological (microscopic) examination in the removed material, mycelium threads of the fungus are revealed.

#### **PREVENTION OF FUNGUS IN ENT ORGANS**

- ✓ Strengthening immunity.
- ✓ Timely treatment of fungal infections in the body.
- ✓ Rinsing the oral cavity with special rinses - especially if you wear removable prostheses.
- ✓ Correction of blood sugar level.
- ✓ Reasonable use of antibiotics.
- ✓ Using earplugs in the pool.
- ✓ Do not use cotton buds or other foreign objects in hygienic care
- ✓ Do not use ear drops with antibacterial components on your own, especially for a long time
- ✓ Try not to touch your ears with dirty hands, especially in public places, public transport, etc
- ✓ If the patient belongs to the risk group (uses a hearing aid, has a history of chronic purulent otitis media, or has concomitant diseases such as diabetes,



allergies, etc.), it is worth visiting an ENT doctor for preventive examinations and monitoring the condition of the external auditory canal

- ✓ Do not use other people's headphones, earplugs, or earplugs
- ✓ After swimming in the pool, open water bodies, thoroughly wipe and dry the ears
- ✓ Do not try to scratch the ear with foreign objects (pins, toothpicks, etc.)
- ✓ At the workplace, regularly ventilate the premises, use personal protective equipment, if provided.

### **Conclusion.**

Therefore, in the diagnosis of mycotic lesions of the ENT organs, today there is a large arsenal of the latest, highly accurate, informative methods that allow identifying the pathogen and its quantitative assessment, determining the sensitivity of the pathogen to antimicrobial drugs and their MIC, establishing the species composition of microbial associations, deciphering the genomes of new types of microorganisms etc. The introduction of a complex of classic and modern diagnostic technologies into clinical practice should become a standard for diagnosing fungal diseases not only of the upper respiratory tract and ear, but also of other biotopes of the human macroorganism.

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