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**CONSERVATIVE TREATMENT OF EXACERBATION OF CHRONIC SUPPURATIVE OTITIS MEDIA**

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*Abstract: The aim of the study: the effectiveness of the treatment of exacerbation of chronic tubotympanic suppurative otitis media with photodynamic therapy*

*Material and methods: A retrospective analysis of 37 case histories of patients who applied to the clinic of otorhinolaryngology with a diagnosis of "exacerbation of chronic suppurative tubotympanic otitis media" in the period from January 2022 to December 2022*

*Results: In patients receiving topically photodynamic therapy (with aqueous solution of methylene blue), by the 3rd day those-At the same time, relief of symptoms such as pulsating noise and pain was noted, as well as a decrease in the severity of otorrhea by the 5th day of therapy.*

*Conclusion: The study showed high clinical efficacy of photodynamic therapy*

*Keywords: chronic purulent otitis media, mesotympanitis, photodynamic therapy, methylene blue*

Chronic suppurative otitis media (CSOM) is a chronic inflammation of the middle ear the Eustachian tube, the tympanic cavity and the cells of the mastoid process [1, 2]. This is the most common infectious ear disease in children, as well as in young people [3]. CSOM is characterized by chronic, periodic or permanent otorrhea for at least 2 weeks through perforation in the eardrum [4].

Despite the fact that this infectious disease is common among all age groups, HCG is most severe in childhood. This may be due to a shorter and horizontally

spaced Eustachian tube, high malleability of the cartilage of the tubal roller and hyperplasia of the nasopharyngeal tonsil in children [5]. In adulthood, frequent exacerbations of CSOM may be associated with inflammation of the rhinosinusotubar zone, dysfunction of the auditory tube or systemic immunosuppression [6-8]. The most common pathogens of CSOM include *Streptococcus pneumoniae*, *Moraxella catarrhalis* and *Haemophilus influenzae*, *Escherichia coli*, *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Klebsiella pneumoniae* and *Proteus* species can also be pathogens of CSOM [8]. It is important to note that the view the microorganism causing the development of depends on climatic conditions and geographical zones [9, 10].

This disease is most common in developing countries. It is most likely that this is due to low socio-economic status, unsatisfactory living conditions, inadequate gigi-disease, malnutrition, overpopulation, irrational antibiotic therapy [11, 12]

Antibacterial agents are the most commonly used method of treating CSOM. They

can be used locally (in the form of drops, ointments on the affected area) or systemically.

The use of local antibacterial drugs is preferable in the case of uncomplicated course of CSOM. This is due to the absence of systemic side effects, such as disorders of the gastrointestinal tract, and high concentration in the focus of infection, ease of use and high efficiency.

Currently, against the background of the appearance of a large number of different synthetic antibiotics, the microbial flora of CSOM has undergone pronounced changes. The appearance of a large number of polyresistant strains and a change in the bacteriological profile in patients with CSOM make clinicians look for drugs that are effective in the treatment of this disease.

The aim of the work is to study the effectiveness of treatment of chronic tubotympanic purulent otitis media with photodynamic therapy with aqueous solution of methylene blue

Tasks of the work:

- 1) determine the indications for the appointment of local photodynamic therapy;
- 2) to determine the effectiveness of local photodynamic therapy with aqueous solution of methylene blue

#### **Material and methods**

A retrospective analysis of 37 case histories of patients who applied to the clinic of otorhinolaryngology with a diagnosis of "exacerbation of chronic purulent tubotympanic otitis media" in the period from January 2022 to December 2022. Patients aged 18 to 73 years (average age  $45.8 \pm 6.4$  years) with a disease duration of 2 to 34 years (average duration  $26.7 \pm 2.4$  years).

The study did not include patients with diabetes mellitus who are allergic to antibiotics of this series, as well as patients with complaints of severe itching in the ears, who had a history of otomycosis, during otoscopy there were signs of fungal lesions, namely white plaque in the bone part of the external auditory canal, black inclusions on the skin of the external auditory canal.

Upon admission to the hospital, all patients underwent a standard anamnesis collection, endoscopic examination of ENT organs, tonal threshold audiometry, if local complications were suspected (development of granulations or cholesteatomas), spiral computed tomography of the temporal bones was performed, microbiological examination of the discharge from the ear at admission, before the start of active therapy.

Patients with CSOM also underwent clinical and biochemical blood tests to determine the activity of the inflammatory process and identify concomitant pathology affecting the course of CSOM.

The criteria for the effectiveness of treatment were normalization of the general condition of patients, cessation of pathological discharge from the ear, normalization of the otoscopic picture. Treatment usually began on the 2nd-4th day after the appearance of the first symptoms of exacerbation of chronic otitis. Photodynamic therapy was administered through external auditory canal with aqueous solution of methylene blue every other day for 10 days for 10 minute

Photodynamic therapy is active against most etiologically significant pathogens of both acute and chronic otitis media, in particular *Streptococcus pneumoniae*, *Haemophilus influenzae*, *S.aureus*, *Moraxella catarrhalis*, etc., including in relation to strains of microorganisms resistant to fluoroquinolones, semisynthetic penicillins and cephalosporins.

Patients received through external auditory canal with aqueous solution of methylene blue every other day for 10 days for 10 minutes. The patients were given an ear toilet. Prior to the study, none of the patients received antibacterial treatment. Systemic antibacterial therapy was not prescribed to patients. Treatment was started before the results of bacterial inoculation of the contents from the ear for microflora and

sensitivity to antibiotics. Additionally, patients were prescribed vasoconstrictive nasal drops and the palatine tonsils were sanitized in the presence of chronic tonsillitis.

The results of the study were evaluated in points on the 3rd, 5th, 7th and 10th days from the start of treatment.

### **Results**

The analysis of patients' medical histories revealed the main complaints of patients receiving a diagnosis of "exacerbation of CSOM", the leading of which were otorrhea, ear pain, ineffectiveness of conservative treatment in outpatient settings, which was the reason for going to the hospital.

The main etiological factors of perforation in patients were a history of acute purulent perforated otitis media (in 35 patients) and post-traumatic perforation of the eardrum (in 2 patients). Of the 37 patients, 3 were treated for elective surgical treatment - tympanoplasty.

The duration of exacerbation of CSOM in patients ranged from 3 to 5-6 weeks. At the same time, patients independently or under the supervision of an otorhinolaryngologist in a polyclinic at their place of residence received conservative treatment without an obvious positive result, which included the use of antiseptic drops in the ear.

The leading complaint upon admission to the department is otorrhea, abundant mucopurulent discharge from the ear, the need for an independent toilet of the ear, especially in the morning. Patients were also concerned about pain in an inflamed ear, which in several cases required the use of painkillers.

During otoscopy and otomicroscopy, free mucopurulent discharge in the external auditory canal after the toilet of the ear, as well as hyperemia of the tympanic membrane, central perforation were determined during treatment.

The size of the perforation varied from 25 to 50% of the eardrum. Hyperemia of the mucous membrane of the tympanic cavity was determined, percussion and palpation of the mastoid process area were painless. With threshold tonal audiometry, the 1st degree of hearing loss prevailed in 28 patients, the 2nd degree in 5 patients, 3rd degree - in 3 patients, 4th degree - in 1 patient.

In patients receiving topical photodynamic therapy relief of symptoms such as pulsating noise and pain was noted already on the 3rd day of application of photodynamic therapy.

As for the otoscopy data, the severity of purulent discharge from the ear in patients significantly decreased by 5th day after the start of photodynamic therapy.

At the same time, by the 8th day in patients with exacerbation of CSOM, the suppuration was completely stopped.

### **Conclusion**

The choice of local photodynamic therapy is based mainly on the safety of active substances in relation to the mucous membrane of the middle ear, the absence of ototoxic effect. It should also be mentioned that there is no need for a wide antibacterial spectrum of action, given the fact that the microflora that causes an exacerbation of CSOM has both natural and acquired resistance to most of the drugs used in the practice of an otorhinolaryngologist penicillin, cephalosporin series and fluoroquinolones

The results of the analysis show a high efficiency of treatment of patients with exacerbation of chronic purulent tubotympanic otitis media with photodynamic therapy. It is important to note that aqueous solution of methylene blue drops, unlike most other ear drops, are made on a water basis, do not contain alcohol, this ensures safe and painless injection of the solution into the middle ear in the presence of a perforation of the eardrum.

The authors declare that there is no conflict of interest.

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