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# METHOD FOR THE TREATMENT OF EXUDATIVE OTITIS MEDIA IN CHILDREN

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## ABOUT ARTICLE

**Key words:** exudative otitis media, auditory tube, middle ear.

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**Abstract:** In article presented the results of complex treatment of children with exudative otitis media. The prevalence of exudative otitis media (EOM) is especially high among children: according to some foreign authors, the disease occurs in 5-25%, while others - in 6.5 to 10.9%. This indicator reaches its maximum values at the age of 2-5 years, and by the age of 10, 80 children have a history of at least one episode of exudative otitis media. As noted by the authors, boys are more susceptible to the disease. In studies, a number of authors have shown that in Europe exudative otitis media is the main cause of hearing loss in children aged 2 to 7 years (during mass examinations of children of this age group, it is found in 30.2 cases). The high frequency of exudative otitis media in children - 4 times more often than in adults - is associated with anatomical prerequisites: a short horizontal auditory tube contributes to infection of the middle ear cavity.

# BOLALARDA EKSUDATİV OTITNI DAVOLASH USULI

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## MAQOLA HAQIDA

**Kalit so'zlar:** ekssudativ o'rta otitis, eshituv nayi, o'rta quloq.

**Annotatsiya:** Maqolada ekssudativ otitli bolalarni kompleks davolash natijalari keltirilgan. Eksudativ o'rta otitning (EO'O) tarqalishi ayniqsa bolalar orasida yuqori: ba'zi xorijiy mualliflarning fikriga ko'ra, kasallik 5-25%, boshqalari esa 6,5 dan 10,9% gacha. Bu ko'rsatkich 2-5 yoshda maksimal qiymatlarga etadi va 10 yoshga kelib, 80 bolada ekssudativ o'rta otitning kamida bitta epizodi bor. Mualliflar ta'kidlaganidek, o'g'il bolalar kasallikka ko'proq moyil. Tadqiqotlarda, bir qator mualliflar Evropada ekssudativ otit 2 yoshdan 7 yoshgacha bo'lgan bolalarda eshitish qobiliyatini yo'qotishning asosiy sababi ekanligini ko'rsatdi (ushbu yosh guruhidagi bolalarni ommaviy tekshirishda u 30,2 holatda topilgan). Bolalarda ekssudativ otitning yuqori chastotasi - kattalarnikiga qaraganda 4 baravar ko'p - anatomik shartlar bilan bog'liq: qisqa gorizontal eshitish naychasi o'rta quloq bo'shlig'ining infektsiyasiga yordam beradi.

# СПОСОБ ЛЕЧЕНИЯ ЭКССУДАТИВНОГО СРЕДНЕГО ОТИТА У ДЕТЕЙ

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**О СТАТЬЕ**

**Ключевые слова:** экссудативный средний отит, слуховая труба, среднее ухо.

**Аннотация:** В статье представлены результаты комплексного лечения детей с экссудативным средним отитом. Распространенность экссудативного среднего отита (ЭСО) особенно высока среди детей: по данным одних зарубежных авторов, заболевание встречается у 5-25%, других - у 6,5-10,9%. Максимальных значений этот показатель достигает в возрасте 2-5 лет, а к 10 годам 80 детей имеют в анамнезе хотя бы один эпизод экссудативного среднего отита. Как отмечают авторы, мальчики более подвержены заболеванию. В исследованиях ряда авторов показано, что в Европе экссудативный средний отит является основной причиной тугоухости у детей в возрасте от 2 до 7 лет (при массовых осмотрах детей этой возрастной группы он обнаружен в 30,2 случаях). Высокая частота экссудативного среднего отита у детей - в 4 раза чаще, чем у взрослых - связана с анатомическими предпосылками: короткая горизонтальная слуховая труба способствует инфицированию полости среднего уха.

## I. INTRODUCTION.

The prevalence of EOM is especially high among children: according to some foreign authors, the disease occurs in 5-25%, while others - in 6.5 to 10.9%. This indicator reaches its maximum values at the age of 2-5 years, and by the age of 10, 80 children have a history of at

least one episode of EOM. As the author notes, boys are more prone to the disease [2]. In studies, a number of authors have shown that in Europe, EOM is the main cause of hearing loss in children aged 2 to 7 years (during mass examinations of children of this age group, it is found in 30.2 cases). The high frequency of EOM in children - 4 times more often than in adults - is associated with anatomical prerequisites: a short horizontal auditory tube contributes to infection of the middle ear cavity [7].

In recent years, there has been an increase in the number of adult patients with exudative otitis media. So, according to the authors, the incidence of exudative otitis media in a number of countries in the structure of ear pathology has increased 2.5 times. The authors explain the increase in the incidence of exudative otitis media by the deterioration of the environment, overwork, stress, which contribute to a decrease in general and local immunity, as well as the irrational use of antibiotics [1].

Inflammatory diseases of the nose and paranasal sinuses, hypertrophy of lymphoid tissue of the pharynx, cicatricial changes in the nasopharynx, paresis of the muscles of the soft palate, curvature of the nasopharynx, as well as malignant neoplasms of the nasopharynx, if they interfere with the drainage function of the auditory tube, can contribute to the development of exudative otitis media [3]. However, the presence of these diseases in itself is not always accompanied by the development of EOM.

Despite the improvement of the methods of conservative treatment of patients with exudative otitis media (EOM), there are many controversial and unresolved issues. Quite often, prolonged inflammation of the middle ear leads to the formation of adhesions, scars, dystrophic changes in the structures of the middle and inner ear. An increase in the incidence of exudative otitis media, a poor prognosis in relation to hearing force to look for new ways of treatment. ESP treatment should be carried out as early as possible. As shown by clinical observations, it is rational to adhere to the tactics "step by step", to gradually move from sparing methods to surgical methods within reasonably acceptable limits [4].

When treating EOM, it is necessary to take into account the following fundamental features of this disease: it is based on an inflammatory process with a predominance of the exudation phase, the main causes of its occurrence are long-term tubular dysfunction and immune disorders, the disease is characterized by a persistent course and a tendency to recurrence [5,6]. Basically, the outcome of the disease depends on how completely it is possible to restore the drainage function of the pipe. Special attention is currently paid to local pharmacotherapy of EOM, which consists in the delivery of medicinal substances directly to the lesion focus. The efficacy of transtubar drug exposure in catheterization of the auditory tube has been shown. In this case, vasoconstrictor drugs, glucocorticosteroids are most often used. For

local introduction into the auditory tubes and the middle ear cavity, a dexamethasone solution is usually used. Dexamethasone, blocking the effect of pro-inflammatory cytokines (interleukin-1-β (IL-1-β) and tumor necrosis factor (TNF-α)), has anti-inflammatory, antiexudative and anti-allergic effects [8].

Conservative therapy for **EOM** includes the use of decongestants, mucoactive, anti-inflammatory and antihistamines, as well as blowing the auditory tubes in the absence of inflammatory changes from the nasal cavity and nasopharynx, pneumomassage of the tympanic membranes [9, 10].

As decongestants, topical decongestants are used (agonists α1- (phenylephrine) or α2- (indanazolamine, xylometazoline, naphazoline, oxymetazoline, tetrizoline) - adrenergic receptors), which reduce the edema of the mucous membrane of the middle ear due to vasoconstriction. At the same time, some authors point to undesirable consequences in the form of dryness of the mucous membrane as a result of the administration of decongestants, which can worsen the course of ESP [11,13].

Currently, topical glucocorticosteroid drugs (flixonase (fluticasone), aldecin (baconase, beclomethasone), nasonex, metasone, rinocort (budesonide), etc.) are prescribed for decongestant and anti-inflammatory purposes. As indicated [12], they penetrate the cell membrane, inhibit the synthesis of histamine by mast cells and reduce the permeability of the vascular wall. So, V.T. Palchun et al. dysfunction of the auditory tube was treated with paratubal injection of diprospan, 3 procedures with an interval of 7 days were effective in 94.4 patients. G. Grzincich et.al. used beclomethasone in the treatment of 46 children with **EOM** as part of conservative therapy and found a significant improvement (p=0.026) compared with the control group [14,15].

H1-histamine blockers of the third generation (desloratadine, levocetirizine, fexofenadine), which block the action of histamine on receptors by the mechanism of competitive inhibition, have a decongestant and desensitizing effect. However, according to The Cochrane Library, the use of this group of drugs is inappropriate in the treatment of **EOM** due to the lack of evidence of their effectiveness [16].

The drug acting on the main links of the inflammatory process is fenspiride (erespal). It reduces the production of a number of biologically active substances - cytokines, derivatives of arachidonic acid, free radicals that play an important role in the development of inflammation, and also blocks α-adrenergic receptors, the stimulation of which is accompanied by an increase in glandular secretion. In the study of E. E. Savelyeva, it was revealed that, when prescribed, an acceleration of the restoration of the function of the middle ear by 33.3 in comparison with the control group. L.A. Luchikhin et al. used fenspiride together with basic therapy in 82 patients

with **EOM**. The results obtained showed a reduction in the duration of treatment by 3 - 5 days, an improvement in clinical and audiological parameters in 68.2 patients [17].

In the treatment of **EOM**, according to a number of authors, it is advisable to use mucolytic drugs (bromhexine, acetylcysteine, fluimucil). E.L. Kolodiy used acetylcysteine in the form of instillation and / or lavage of the ear for patients with **EOM**, which reduced the viscosity of the exudate and shortened the treatment period to 2-5 days [4]. Combined drugs are also used, for example, rhinofluimucil - a nasal spray containing a mucolytic - acetylcysteine, which reduces the viscosity of the exudate, and a sympathomimetic - tuaminoheptane sulfate, due to which there is a vasoconstrictor effect, which reduces the edema of the mucous membrane in the area of the mouth of the auditory tube [11].

The aim of this work is to increase the effectiveness of treatment of children with exudative otitis media.

## II. MATERIAL AND METHODS.

In accordance with the purpose of the study and to fulfill the assigned tasks, clinical studies were carried out in 110 patients with exudative otitis media who were hospitalized in the ENT department of the TMA multidisciplinary clinic in 2018-2021. All patients underwent a comprehensive examination, including the collection of complaints, examination of the ENT organs, endoscopy of the nasal cavity, otoscopy, impedance measurement, audiometry and acumetric studies.

We carried out a comprehensive examination and treatment of 110 children who were at the pediatric ENT department of the MPC TMA with exudative otitis media, who underwent clinical, audiological, allergeological, immunological and laboratory-instrumental studies on the effectiveness of complex treatment.

The age structure of children is shown in Figure 1.

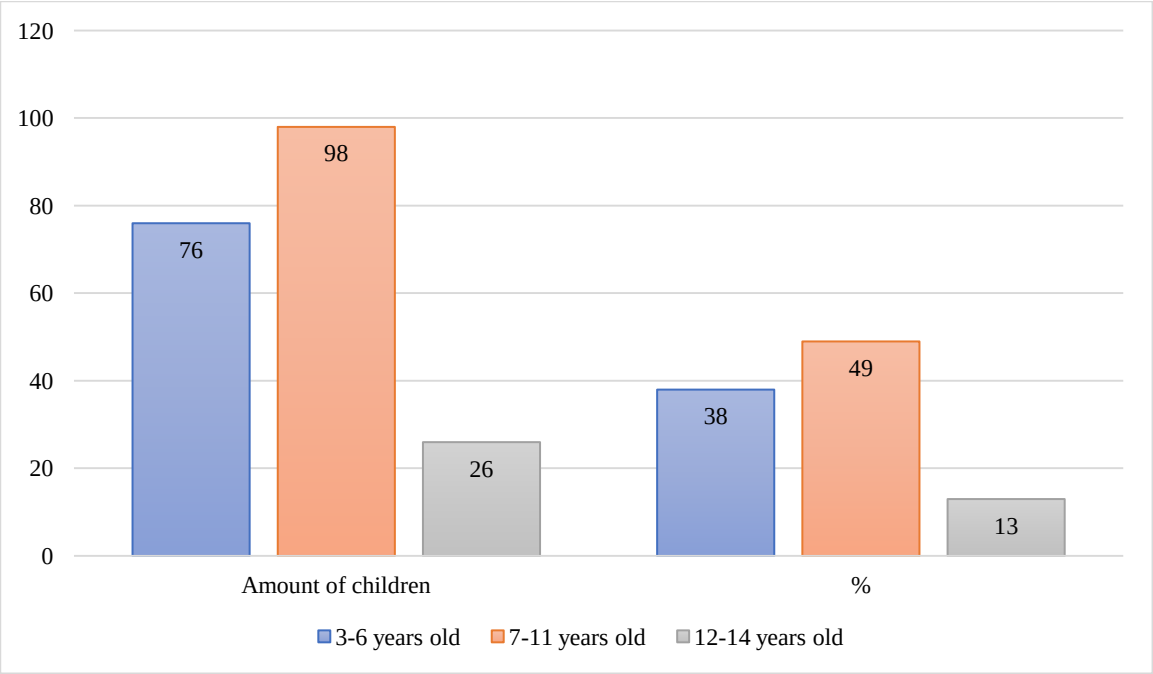


Figure №1 The age composition of the observed children with EOM.

The figure shows that the number of children suffering from EOM decreases with age. However, in children of the younger age group, there is an insufficient detection of this disease. For example, the parents of 63 children, in whom the causes of EOM were adenoids, acute rhinosinusitis, did not previously go to a doctor with complaints of hearing loss. Previously, 102 children received treatment for EOM. in boys, EOM occurs twice as often as in girls (Figure 2). There are also noticeable seasonal changes in the incidence of EOM, which increases in the autumn-winter period.

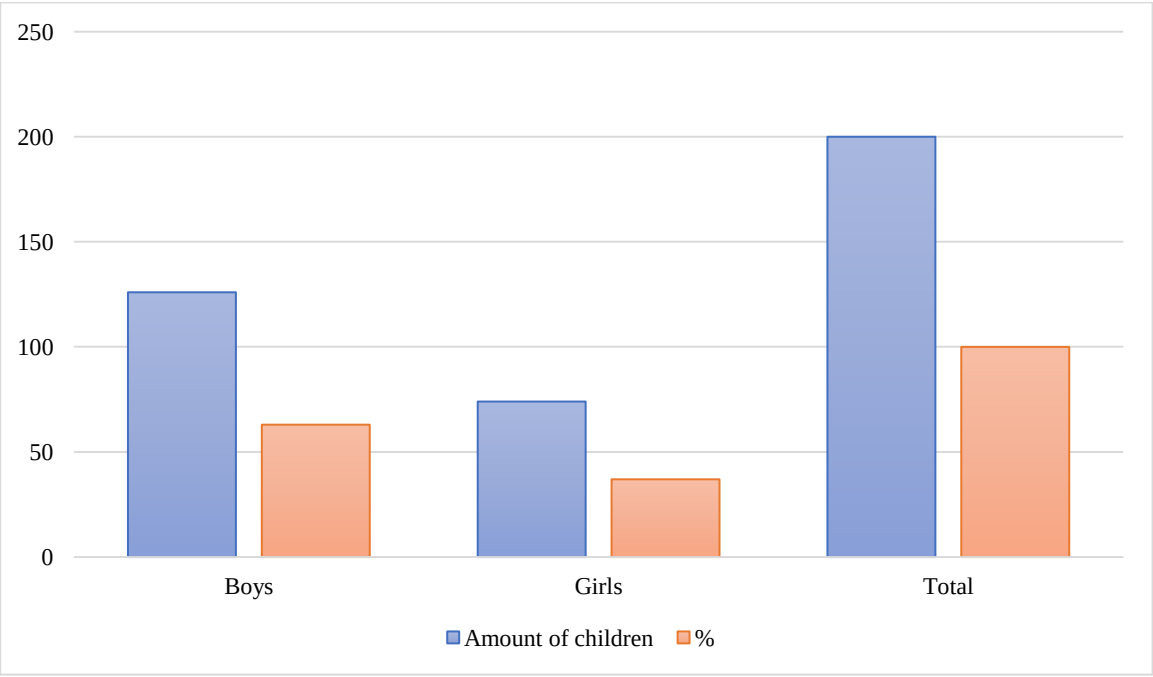


Figure 2 Distribution of children with EOM by gender.

Among the patients we observed, there were 35 children (unilateral processes), and 75 children (bilateral processes) suffering from acute EOM (Figure 3).

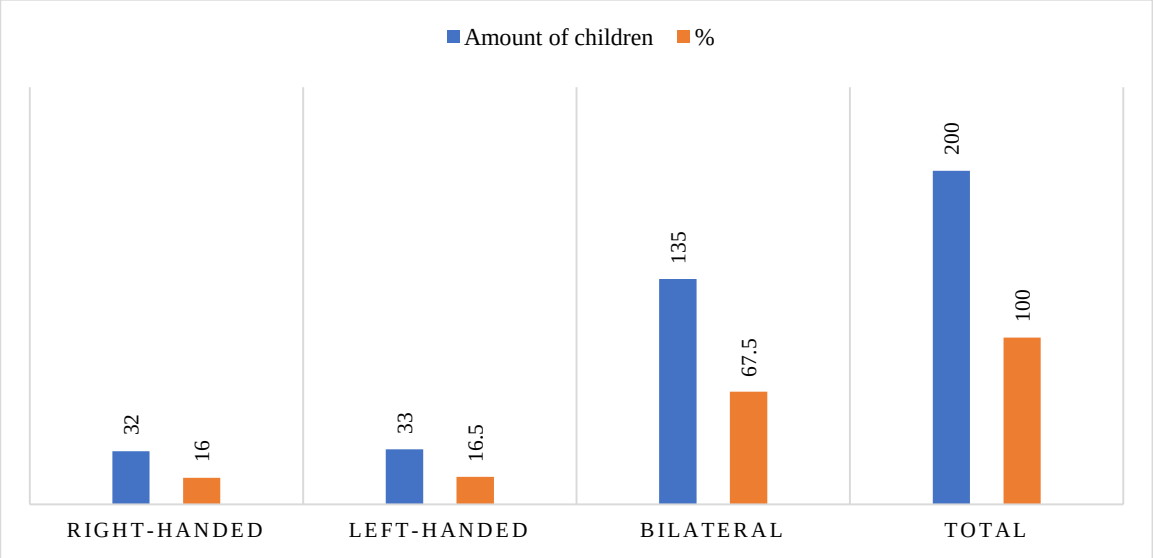


Figure 3 Localization of the process in children with EOM.

Acute EOM revealed:

• in the primary phase - in 53 children (29.4%)

• in the secretory phase - in 43 children (68.3%)

• in the fibrinous phase - in 24 children (22.4%)

**Some of the reasons that preceded the development of EOM were:**

• Adenoids and rhinosinusitis - in 43% of children;

• atrophic and cicatricial changes in the area of the pharyngeal opening of the auditory tube - in 5% of children;

• local malformations of the nasal cavity - in 15% of children; vasomotor salpingootitis and rhinitis - in 8% of children; hypertrophy of the tubal rolls - in 8% of children;

• adhesions of the auditory tube - in 3% of the studied children. physiological obstruction of the pharyngeal opening of the auditory tube in 18% of children;

• adhesions of the auditory tube - in 3% of the studied children.

We have noted a change in the causes of EOM, depending on the age of the children. Children in the younger age group (from 3 to 6 years) were more likely to have adenoiditis (in 43% of the studied patients), physiological obstruction of the pharyngeal opening of the auditory tube (18%). In children from 7 to 11 years old, local malformations of the nasal cavity were more common (15%), hypertrophy of the tubal ridges (8%), and cicatricial processes in the nasopharynx (5%). At the age from 12 to 14 years - acute rhinosinusitis (41%).

## III. RESULTS AND DISCUSSION.

For each position, we analyzed a set of clinical data, indicators of otoscopy, ventilation function of the auditory tube and hearing thresholds.

**Good result** – the patient has no complaints or minimizes clinical manifestations, with a decrease in the level of discomfort according to the VAS to 0-2 points, an improvement in the otoscopic picture (a decrease in the level of exudate in the tympanic cavity, opening of the pharyngeal opening of the auditory tube), with the ventilation function of the auditory tube of the 1st degree and the hearing threshold is less 20 dB, improvement of immunogram indicators (including normalization of the immunoregulatory index) and tubocytogram (including normalization of the incomplete phagocytosis indicator), indicators in the SAN test categories by 30 -35%.

A good result was noted in 77 (59.2%) patients. Of these, 14 (46.7%) patients in group 1, 20 (58.8) - in group 2, 19 (59.4) - in group 3 and 24 (70.6%) patients - in 4 group.

**Satisfactory result** – positive dynamics of clinical manifestations, with a decrease in the level of discomfort according to VAS by 2-2.5 points, an improvement in the otoscopic picture (a decrease in protrusion of the tympanic membrane, opening of the pharyngeal opening of the auditory tube), ventilation function of the auditory tube to I-II degrees and a decrease in hearing thresholds by 10 -20 dB (up to a hearing threshold of 26-40 dB), an improvement in immunogram indicators (including an increase in the immunoregulatory index) and a tubocytogram (including a decrease in an indicator of incomplete phagocytosis), indicators in the SAN test categories by 25 -30%.

A satisfactory result was noted in 38 (29.2%) patients, of which in 11 (36.6%) patients in group 1, in 10 (29.4%) in group 2, in 9 (28.1%) - in group 3 and in 8 (23.5%) patients - in group 4.

**An unsatisfactory result** - minor changes in the totality of all of the above indicators, while the patients retain signs of dysfunction of the auditory tube and II degree of hearing loss.

An unsatisfactory result was noted in 15 (11.5%) patients, of which in 5 (16.7%) patients in group 1, in 4 (11.8%) in group 2, in 4 (12.5%) - in group 3 and in 2 (5.9%) patients - in group 4. Surgery was recommended for these patients.

**No change** - the lack of dynamics of all the listed indicators as a result of treatment.

**Deterioration** - negative dynamics of clinical, functional, laboratory and psychoemotional indicators as a result of treatment.

Analysis of the effectiveness of the immediate results of treatment of patients with exudative otitis media revealed the following changes in subjective clinical manifestations (Table 1).

Table 1

Dynamics of clinical manifestations in patients with exudative otitis media

| Clinical manifestations | 1 group (n=32) | | 2 group (n=33) | | 3 group (n=35) | | 4 group (n=35) | |
|---|---|---|---|---|---|---|---|---|
| | Before treatmentя | After treatment | Before treatment | After treatment | Before treatment | After treatment | Before treatment | After treatment |
| hearing loss | 27 | 15 | 33 | 14 | 32 | 16 | 35 | 13 |
| a feeling of stuffiness in the ear | 25 | 16 | 27 | 14 | 26 | 11 | 31 | 8 |
| noise in the ear | 24 | 8 | 27 | 4 | 26 | 5 | 27 | 7 |
| feeling of fullness and pressure in the ear | 21 | 4 | 19 | 5 | 21 | 4 | 25 | 6 |
| a feeling of fluid overflow in the ear | 14 | 6 | 15 | 3 | 12 | 4 | 11 | 3 |

As can be seen from the presented table, as a result of treatment, the number of subjective manifestations of EOM decreased by 53.3 in patients of group 1, by 68.9% in group 2, by 69.4 in group 3 and by 78.8% in group 4.

The initial level of discomfort according to the VAS scale in the examined patients averaged 4.88 ± 1.31 points. As a result of the treatment, the level of discomfort decreased in all groups (Fig. 4).

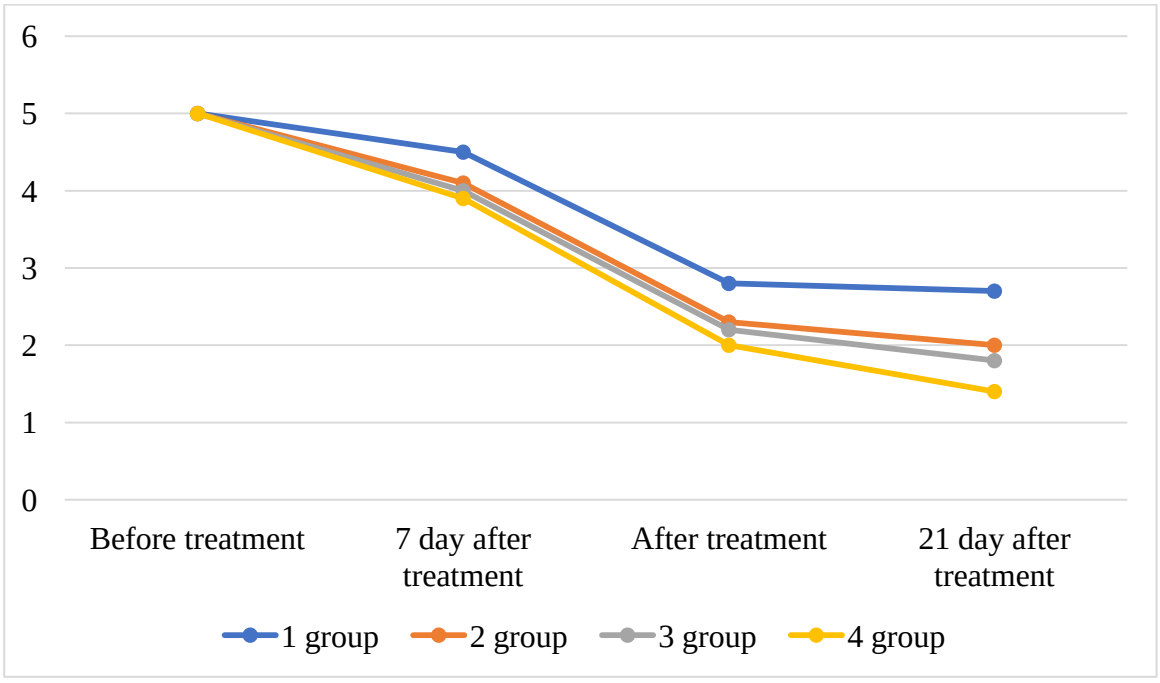


Figure 4. Dynamics of the level of discomfort according to VAS (points)

As a result of treatment, as can be seen in the figure, in group 1 the level of discomfort decreased by 42.8%, in group 2 - by 56.2%, in group 3 - by 57.3% and in group 4 - by 72.2 % compared to baseline. Patients associated these positive changes primarily with improved hearing, as well as with a decrease or disappearance of the feeling of stuffiness, pressure and fullness in the ear.

According to otomicroscopy data, patients with EOM after treatment retained a polymorphic pattern of changes in the tympanic membrane, however, the combination of these changes, indicating the presence of exudate in the tympanic cavity and violations within the tympanic pressure, decreased in group 1 by 48.3%, in group 2 - by 61 , 2, in group 3 - by 60.6 and in group 4 - by 69.2 (Table 2).

Table 2

Dynamics of the otomicroscopic picture in patients with exudative otitis media

| Oto-microscopic picture | 1 group (n=32) | | 2 group (n=33) | | 3 group (n=35) | | 4 group (n=35) | |
|---|---|---|---|---|---|---|---|---|
| | Before treatmen тя | After treatme nt | Before treatmen тя | After treatme nt | Before treatmen тя | After treatme nt | Before treatmen тя | After treatme nt |
| Exudate level | 16 | 8 | 19 | 6 | 18 | 6 | 18 | 4 |
| Strengthening the vascular pattern of the tympanic membrane | 16 | 10 | 17 | 9 | 15 | 10 | 16 | 9 |
| Shortening of the light cone of the tympanic membrane | 24 | 12 | 24 | 11 | 23 | 7 | 25 | 6 |
| Bulging of the tympanic membrane | 22 | 12 | 24 | 10 | 21 | 8 | 25 | 7 |
| a feeling of fluid overflow in the ear | 4 | 1 | 3 | 1 | 4 | 1 | 3 | 1 |

Endoscopic examination in patients with EOM after treatment showed an improvement in the opening of the pharyngeal orifice of the auditory tube: signs of dysfunction decreased in patients of group 1 by 46.2%, group 2 - by 64.3%, group 3 - by 66.7% and group 4 - by 75.0% in comparison with the initial values.

Analysis of the results of tonal threshold audiometry showed a statistically significant restoration of hearing air thresholds in all groups of patients.

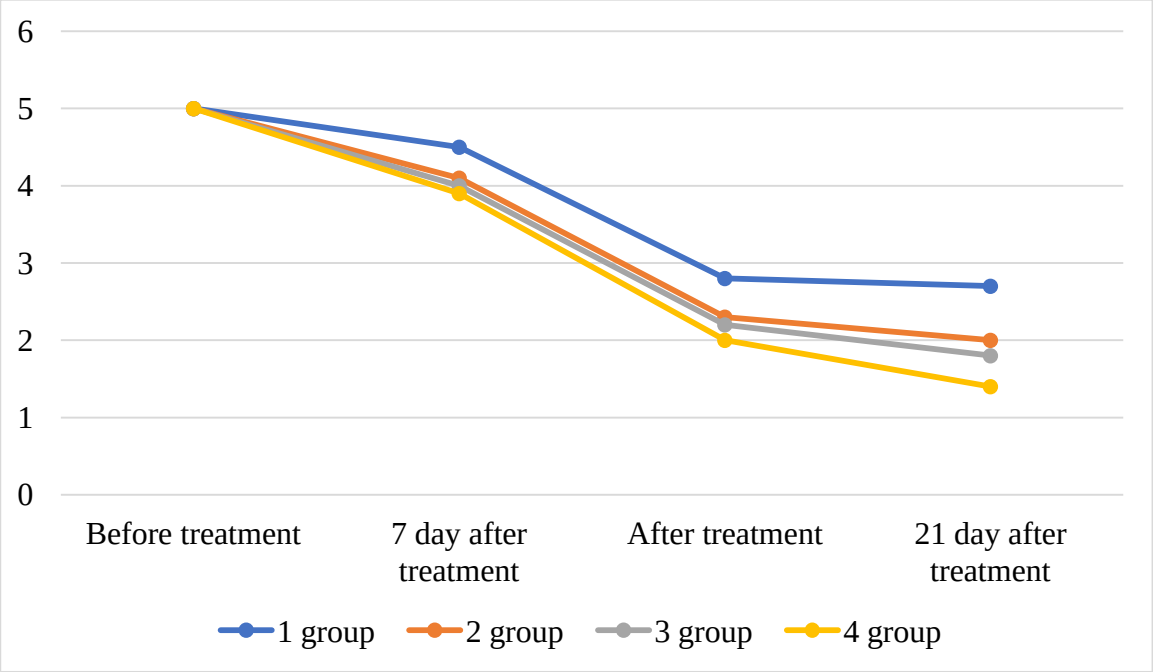


Figure 5. Change in air conduction thresholds in patients with exudative otitis media according to tonal threshold audiometry

As can be seen in Figure 5, compared with the initial level, the air conduction hearing threshold decreased in group 1 by 37.5%, in group 2 - by 46.3%, in group 3 - by 47.8% and in group 4 - by 60.7%, remaining without significant changes and 21 days from the start of treatment.

As a result of a 14-day course of treatment, hearing improvement occurred in patients of all groups with the most significant positive changes in the direction of decreasing the air conduction thresholds in patients of groups 2, 3, and 4 (Fig. 6).

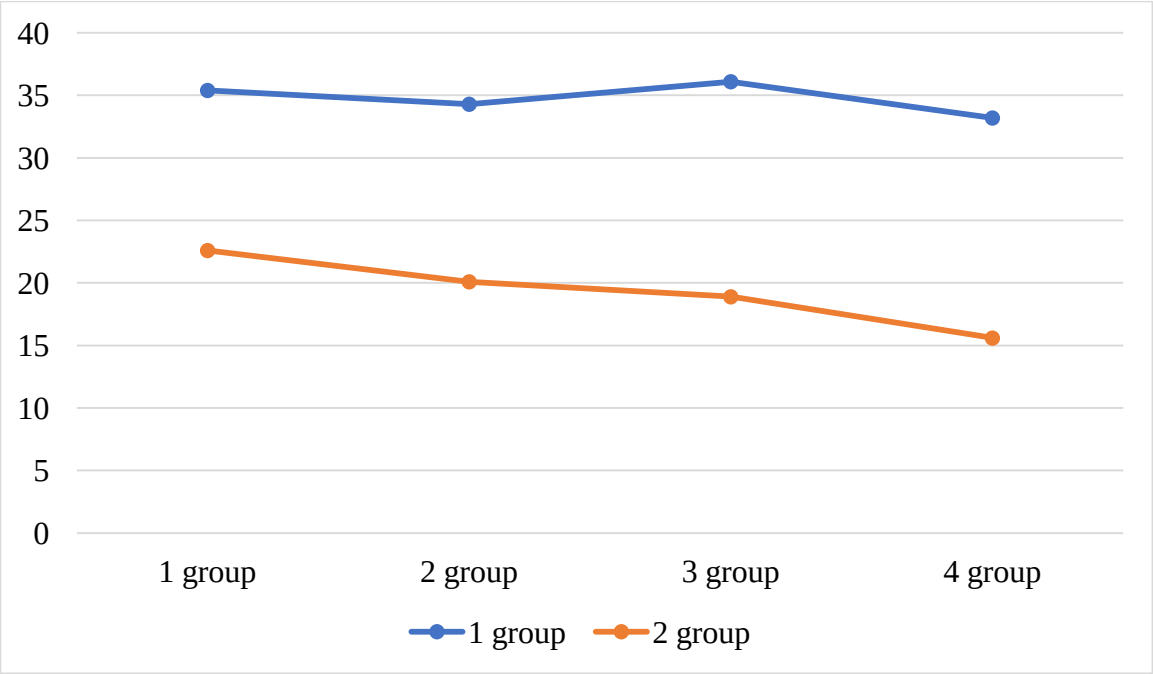


Figure 6. Dynamics of hearing recovery in patients with exudative otitis media by air conduction threshold

Restoration of hearing to normal values was observed in only 6.6% of patients in group 1, while in group 2 - in 17.6%, in group 3 - in 15.6% and in group 4 - in 26.5% of patients.

When measuring the bone-air interval, we noted a uniform decrease in indicators at all frequencies, which indirectly indicated an improvement in sound conduction in the middle ear cavity (Table 3).

Table 3

Dynamics of parameters of the bone-air interval according to tonal threshold audiometry in patients with exudative otitis media (in dB) (M ± m)

| Frequency Hz | 1 group (n=32) | | 2 group (n=33) | | 3 group (n=35) | | 4 group (n=35) | |
|---|---|---|---|---|---|---|---|---|
| | Before treatmentя | After treatment | Before treatmentя | After treatment | Before treatmentя | After treatment | Before treatmentя | After treatment |
| 500 | 32,2±1,5 | 20,6±1,0 | 32,3±1,5 | 17,4±0,7 | 33,1±1,6 | 17,2±0,8 | 32,2±1,5 | 13,4±0,2 |
| 1000 | 31,4±1,5 | 20,4±0,9 | 32,2±1,5 | 17,6±0,8 | 31,8±1,4 | 17,5±0,6 | 33,0±1,4 | 13,2±0,2 |
| 2000 | 33,7±1,4 | 20,2±0,8 | 31,1±1,5 | 17,5±0,8 | 32,7±1,6 | 17,3±0,7 | 33,5±1,6 | 12,9±0,2 |
| 4000 | 32,3±1,5 | 20,3±0,9 | 33,4±1,6 | 17,3±0,7 | 32,1±1,5 | 17,3±0,8 | 31,8±1,3 | 13,3±0,1 |

As can be seen from the presented table, after treatment, there was a statistically significant decrease in the bone-air gap in group 1 by 37.0%, in groups 2 and 3 - by 45.9% and 46.6%, respectively, and the most pronounced - in 4 group - by 59.5%.

The results of the analysis of indicators of acoustic impedance barometry during treatment showed a gradual transition of tympanograms from type B to type C and then to type A, the average level within the tympanic pressure was ± 28.6 ± 3.9 dPa, the acoustic muscle reflex was recorded in group 1 in 16 ( 53.3%) patients, in group 2 - in 24 (70.6%), in group 3 - in 23 (71.9%) and in group 4 - in 28 (82.4%) patients, which indicated normalization of IAP and restoration of the mechanics of the conduction system of the middle ear. When baron-loading tests were carried out in the course of treatment, a gradual restoration of the barofunction of the auditory tube was observed in all groups of patients. In patients of groups 2 and 3, against the background of complex treatment, restoration of the barofunction of the auditory tube was observed in a shorter time and in a larger number of patients, compared with patients who received only pharmacotherapy, while the most pronounced effect was observed in patients of group 4 against the background of traditional treatment.

Barofunction of the auditory tube by the end of treatment reached grade I in 36.6% of patients in group 1, in 44.1% in group 2, in 46.8% in group 3, and in 55.9% of patients in group 4 with an initial absence in all groups. ... As for the barofunction of the IV degree auditory tube, it was completely eliminated in all patients of group 4 and continued to be observed in 6.6 versus the initial 43.3% of patients in group 1, in 5.8% versus 41.2% in group 2 and in 3.1% versus 40.6% of patients - 3 groups. The largest number of patients with grade I barofunction (55.9%) and the smallest with grade IV barofunction (-41.2%) were observed in group 4.

In the long-term period, 6 months after the end of treatment, the effectiveness of conservative therapy was assessed by the presence or absence of relapses of the disease. Relapse meant the return of the following clinical manifestations of EOM after their temporary disappearance:

- Subjective symptoms - complaints of congestion in the ear, discomfort, hearing loss;
- Objective symptoms - detection of exudate during otoscopy, hearing loss of 10 dB or more according to audiometry, tympanogram type B or C according to impedance barometry.

Thus, data from 110 patients with EOM were analyzed. Of these, relapses of the disease were detected in 17 patients (15.6%). All cases of relapse were characterized by the recurrence of EOM symptoms 2-4 months after the disappearance of the main manifestations of the disease. As you know, the occurrence of a relapse is associated with incomplete elimination of the causes of the disease in the course of its treatment, which, under unfavorable conditions, leads to its repeated development. Such conditions in 17 patients were ARVI - in 70.6% of cases (12 patients), a difference in barometric pressure - in 17.6 (3 patients) and lacunar angina - in 11.8% of cases (2 patients). The distribution of the number of patients with relapses by groups of patients with EOM is shown in Table 4.

Table 4

Распределение количества рецидивов по группам пациентов с экссудативным средним отитом

| EOM relapse | 1 group (n=32) | | 2 group (n=33) | | 3 group (n=35) | | 4 group (n=35) | |
|---|---|---|---|---|---|---|---|---|
| | Abs. | % | Abs. | % | Abs. | % | Abs. | % |
| | 5 | 25 | 4 | 17,6 | 3 | 13,5 | 2 | 8 |

As can be seen from Table 4, the number of patients with relapses in group 2 is 1.5 times less, in group 3 - 1.6 times less than in group 1, which indicates a positive clinical effect of acupuncture in the treatment of EOM. The maximum decrease in the number of patients with relapses - 3.7 times - was observed in group 4, which reflects the persistent positive clinical effect of complex therapy for exudative otitis media.

Summing up the direct results of the conservative treatment of patients with EOM, it should be noted that the positive dynamics of clinical and functional parameters was observed with all the methods of treatment used. Basic pharmacotherapy, in its isolated use, contributed to a decrease in the subjective clinical manifestations of exudative otitis media in 53.3% of patients, the level of discomfort according to the VAS decreased by 42.8%, the otoscopic picture improved by 48.3%, and the opening of the auditory tube orifice - in 46, 2% of patients. According to audiometry, a 37.5% decrease in air conduction thresholds was observed, which correlated with a decrease in the bone-air gap ($r = 0.75$) and indicated restoration of the middle ear sound conduction system. Analysis of the results of impedance barometry showed the appearance of an acoustic muscle reflex in 53.3%, restoration of barofunction of the auditory tube up to grade I - in 36.6% of patients.

Complex treatment increased the effectiveness of the latter by 15.6% to reduce clinical manifestations, including by 13.4% to reduce discomfort, by 12.9% to improve the otoscopic picture, by 18.1% to open the mouth of the auditory tube, to improve hearing thresholds by 8.8%, the appearance of an acoustic muscular reflex by 17.3% and the restoration of barofunction of the auditory tube up to grade I by 7.5%. The data obtained indicate the clinical effectiveness of the developed method of complex treatment, which contributed to the restoration of IAP and the improvement of sound conduction of the middle ear in patients with exudative otitis media in the secretory stage.

The most significant and achieved in a shorter time frame a decrease in subjective and objective clinical and functional disorders in patients with EOM was noted with complex treatment: the effectiveness of pharmacotherapy increased by 25.5% to reduce subjective clinical manifestations, including a decrease in discomfort according to the VAS by 29 , 4%,

improvement of the otoscopic picture by 20.9% and opening of the mouth of the auditory tube by 28.8%. There was a decrease in the thresholds of air conduction of hearing by 23.2%, the appearance of an acoustic muscular reflex by 29.1% and restoration of barofunction of the auditory tube up to grade I by 19.3% in comparison with group 1. The results obtained, in our opinion, are explained by the fact that the inclusion in the treatment of allergic rhinitis in children with EOM, which significantly improved the contractile function of the auditory tube with the restoration of IAP and improved sound conduction in the middle ear.

Discussing the results of the study, one should pay attention to the following provisions.

The basis of the conservative treatment of EOM, as previously reported by other authors, is pharmacotherapy, which includes, according to the recommendations of the National Guidelines for Otorhinolaryngology, the use of decongestants, mucoactive, anti-inflammatory and antihistamines drugs and which can be called basic pharmacotherapy. This method, based on the aggregate analysis of clinical and functional indicators, allowed us to obtain a good immediate treatment result in 46.7% of cases, satisfactory - in 36.6% and unsatisfactory - in 16.7% of cases. However, in the long term, a relapse of the disease occurred in 25.0% of patients. This, in our opinion, suggests that pharmacotherapy affects all links of the pathological process.

A good direct result of treatment of patients with EOM in the secretory stage was obtained in 58.8% of cases, satisfactory - in 29.4% and unsatisfactory - in 11.8% of cases. In the long term, a relapse of the disease occurred in 17.2% of patients.

## IV. CONCLUSION.

Thus, data from 110 patients with EOM were analyzed. Of these, relapses of the disease were detected in 17 patients (15.6%). All cases of relapse were characterized by the recurrence of EOM symptoms 2-4 months after the disappearance of the main manifestations of the disease. As you know, the occurrence of a relapse is associated with incomplete elimination of the causes of the disease in the course of its treatment, which, under unfavorable conditions, leads to its repeated development. Such conditions in 17 patients were ARVI - in 70.6% of cases (12 patients), a difference in barometric pressure - in 17.6 (3 patients) and lacunar angina - in 11.8% of cases (2 patients). As a result, the direct results of the conservative treatment of patients with EOM, it should be noted that the positive dynamics of clinical and functional indicators was with all the methods of treatment used.

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