

EVALUATION OF THE EFFECTIVENESS OF COMPLEX APPLICATION OF OZONE IN CHRONIC PURULOUS INFLAMMATION DISEASES OF THE EAR

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Abstract: The development of modern methods in the treatment of chronic suppurative otitis media (CSOM) is one of the pressing problems of modern otiatrics. Among the various methods of treating chronic purulent otitis media, currently there is a rational combination of general measures of influence on the body with local treatment. A comparative analysis of the level of effectiveness of a solution of decasane 0.002% in combination with O₃ and YAG-Ho laser radiation in special therapeutic modes was carried out, the advantage of this technique and its mechanism were outlined. The results of treatment of 30 patients are presented. All patients underwent lavage of the middle ear cavity with antiseptic solutions, followed by the administration of decasan solution, alternating in a combination of oxygen and IAN-No laser. Despite this, in patients 1 – group 12% of patients, 2 – group 4.56% of patients, 3 – group 31% of patients, a short-term effect was noted with subsequent recurrence of the disease.

Key words: Chronic purulent otitis media, otoscopy, ear endoscopy, transtymponal pressure, ear lavage, ozone, laser therapy.

Аннотация: Разработка современных методов в лечении хронических гнойных средних отитов (ХГСО) является одной из актуальных проблем современной отиатрии. Среди разных методов лечения хронических гнойных средних отитов в настоящее время является рациональное сочетание общих мер воздействия на организм с местным лечением. Проведен сравнительный анализ уровня эффективности действия раствора декасана 0,002% в сочетании О₃ и излучение ИАГ-Но лазера в особых терапевтических режимах, изложено преимущество данной методики и ее механизм. Предлагается результаты лечения 30 пациентов. Всем больным было произведена промывания полости среднего уха антисептическими растворами с последующим введением раствора декасана чередуя в сочетании кислорода и ИАН-Но лазера. Несмотря на это у больных 1 – группе 12% больных, 2 – группа 4,56% больных, 3 - группа 31% больных отмечался коротковременный эффект с последующим рецидивированием болезни.

Ключевые слова: Хронический гнойный средний отит, отоскопия, эндоскопия уха, транстимпональное нагнитание, промывание уха, озон, лазеротерапия.

Annotatsiya: Surunkali yiringli otitisni davolashda zamonaviy usullarni ishlab chiqish zamonaviy otiatriyaning dolzarb muammolaridan biridir. Surunkali yiringli otitni davolashning turli usullari orasida hozirgi vaqtda mahalliy davolash bilan organizmga umumiy ta'sir qilish choralarining oqilona kombinatsiyasi mavjud. Maxsus terapevtik rejimlarda O₃ va YAG-Ho lazer nurlanishi bilan birgalikda dekasani 0.002% eritmasining samaradorlik darajasining qiyosiy tahlili o'tkazildi. Ushbu texnikaning afzalligi va uning mexanizmi ko'rsatildi va 30 nafar bemorlarning davolash natijalari tahlil qilindi. Barcha

bemorlar o'rta quloq bo'shlig'ini antiseptik eritmalar bilan yuvishdi, so'ngra kislorod va IAN-No lazer kombinatsiyasida galma-gal dekan eritmasini yuborishdi. Shunga qaramay, 1-guruhdagi bemorlarning 12% bemorlarda, 2-guruhdagi bemorlarning 4,56%, 3-guruhdagi bemorlarning 31% bemorlarda kasallikning keyingi takrorlanishi bilan qisqa muddatli ta'sir qayd etildi.

Kalit so'zlar: O'rta quloq tizimi, o'rta quloq surunkali yiringli yallig'lanishi, ozon, dekan.

Chronic inflammatory diseases of the mucous membrane of the tympanic cavity and other structures related to the middle ear system are the most common diseases [1]. Despite scientific advances aimed at the diagnosis, treatment and prevention of chronic suppurative otitis media (CSOM), the frequency of their occurrence not only does not decrease, but also tends to increase in recent years [1,3].

The basic principle of conservative treatment of CHSO, as well as other focal infections, is the rational combination of general measures of influence on the body with local treatment. The first ones should be aimed at eliminating the general infection in CGSO and increasing the immunological strength of the body. Local treatment consists of creating optimal conditions for eliminating inflammation at the site, suppressing local infection and stimulating reparative processes [4,7].

The effectiveness of treatment for CHSO largely depends on the bacteriocidal effect of various medicinal substances used for administration into the tympanic cavity (TU). Many patients suffer from intolerance to various medications, or the flora of the cavity turns out to be insensitive or resistant to most antibacterial drugs used for treatment. Drug-resistant microflora causes not only an increase in treatment time, but also a more severe course of diseases and the development of complications [2]. In this regard, it is necessary to study the effectiveness of new antimicrobial agents in the treatment of CHSO and develop optimal methods for their use.

Considering the above, it seemed interesting to us to study the effect of medical ozone (O₃) and ozone-containing drugs in the treatment of chronic hepatitis O, both as an independent agent and in combination with a solution of dekan and laser. Ozone, by regulating the course of protective reactions, reduces the destructive phase of inflammation and reduces the risk of developing scars and adhesions in the tympanic cavity, promoting epithilization. However, there is no information about the most appropriate time of action of O₃ on various microbial factors, its effect on various microbial populations depending on time, and also in combination with antibiotics. The laser allows you to stop signs of inflammation and stimulate proliferation.

We observed 30 patients with CHSO. During otoscopy, the patients had a defect in the tympanic membrane in the stretched part, the mucous membrane of the tympanic cavity was hyperemic and swollen, and there was copious mucopurulent discharge. Our bacteriological studies showed that in the majority (80%) of cases, staphylococcal flora was detected in patients with CHSO, including *Staphylococcus epidermidis*, *staphylococcus viridians*, *staphylococcus aureus*, *staphylococcus haemolyticus* *staphylococcus pyogenes*, as well as β -hemolytic streptococcus group A, etc. B Depending on the treatment method, patients are divided into three groups.

Group 1 included 14 patients with CHSO who poorly or did not tolerate antibacterial drugs at all; their external auditory canal was washed with a solution of furacillin 1:5000, followed by ozone therapy. In the 2nd group, 13 patients underwent deep ozonation of the middle ear using freshly prepared ozone containing a solution of decasane. YAG-Ho laser radiation was carried out. The 3rd group was the control group and consisted of 13 patients who underwent traditional therapy, rinsing the ear with furacillin solutions 1:5000 according to the standard treatment method.

To carry out the treatment, we used <<OZONATOR 0-1M >> (Metromed, Samarkand) which has a hole at the end. We used -0.002% Decasan as an ozonized solution. The solution was bubbling for 5 minutes. During the five-minute bubbling process, a solution containing ozone at a concentration of 600 µg/l was obtained. For treatment, only freshly prepared ozonized solution was used. To administer a medicinal substance into the cavity of the middle ear, a disposable sterile syringe (volume 5 ml for the treatment of otitis media), a fragment of a plastic connecting tube from an intravenous infusion system 4 cm long and a mobile occlusion balloon with a non-return valve or an inflating rubber cuff of any other suitable for the lumen of the outer ear are required. ear canal design. The medicinal substance is preheated in a water bath.

To carry out treatment, first, the end of the connecting tube is hermetically fixed in the external auditory canal with a mobile occlusive balloon. 5 ml of preheated ozonized solution is taken into a sterile disposable syringe.

The next step is to insert the syringe into the free end of the connecting tube. Then, the syringe piston is pulled toward itself, thereby reducing the pressure in the external auditory canal. Air begins to flow into the ear canal and into the syringe, and the drug moves into the tympanic cavity. Complete administration of the drug is achieved by several return tractions of the piston.

During treatment, patients of the second group underwent 5 procedures of deep ozonation of the middle ear cavities in a controlled pressure regime.

The procedure was carried out daily for 5 minutes. Dosage 6 mcg/l per minute. One session at a concentration of 6 mcg/l. min. within 5 minutes. Amounts to 30 µg/l. The YAG-Ho laser radiation was carried out in special therapeutic modes. The duration of treatment depended on the dynamics. No intolerance to drugs or ozone therapy was observed in patients.

However, in the control group, over time, the sensitivity of microorganisms to antibiotics in most patients decreased, which caused not only an increase in treatment time, but also a more severe course of the disease and the occurrence of various complications. [2].

The results of treatment were assessed according to the amount of washing, ozonation, otoscopic and x-ray examination, as well as functional, laboratory and bacteriological studies. We recorded "recovery" in patients with the absence of subjective and objective symptoms of the disease, loss of vision from the ear, stable remission of the inflammatory reaction and stimulation of regeneration elements, normalization of functional and laboratory tests.

We considered “improvement” to be a condition when the patients’ general well-being returned to normal, headaches stopped, ear discharge decreased, and hearing improved. The absence of pronounced changes in the course of the disease or the onset of short-term improvement followed by relapse of the disease was assessed by us as “lack of effectiveness.” There was no worsening of the disease in any case. Data on the effectiveness of treatment are given in the table.

Table 1

Results of treatment of patients with CHSO using intra-auricular ozonation laseotherapy

Group of patients	Treatment effectiveness	HGSO	
First	Recovery		7 (70%)
	Improvement		2 (20%)
	No effect		1 (10%)
Secund	Recovery		13 (86,6%)
	Improvement	-	1 (6,66%)
	No effect		1 (6,66%)
Third	Recovery		3 (20%)
	Improvement		9 (60%)
	No effect		3 (20%)
Total	Recovery		23 (57,5%)
	Improvement		12 (30%)
	No effect		5 (12,5%)

An important indicator of the effectiveness of the treatment of patients with CHSO is the amount of BP washing, transtymponal administration of drugs and the time of ozonation necessary to achieve a therapeutic effect.

The time spent on the tip and the number of rinsing followed by ozonation of the ear in the 1st main group with CGSO mesotympanitis was 3.0 ± 0.5 with epitympanitis 3.6 ± 0.69 in the 2nd main group - respectively - 2.8 ± 0.8 and 3.0 ± 0.1 .

In patients in the control group, the number of rinses through the tip and administration of decamitoxin solution was the same as for CGSO. Mesotympanitis 5.0 ± 0.58 , and with epitympanitis – 6.53 ± 0.54 .

Disappearance of clinical manifestations of the disease in CHSO. Mesotympanitis in patients of the main groups was observed after $5.5 - 0.2$ and 5.8 ± 0.2 days, and in the control group after 9 ± 0.2 , with CGSO. Epitympanitis - after 7.3 ± 0.2 days, and in the control group - after 14.2 ± 0.2 days. With combined treatment of decamitoxin solution and O₃, a 2-fold reduction in the duration of treatment for both mesotympanitis and epitympanitis was noted compared with the control group. As for the effectiveness of treatment. then normalization, as well as significant improvement in auditory function, corresponded to “clinical recovery and improvement.”

In a comparative analysis of the suppression of mucopurulent discharge in patients of the main groups and the control group, the former showed statistically significantly better results.

When studying temperature changes in tissues in the mastoid area before and after the first procedure using O₃, both with and without the use of antibiotics, an increase in temperature was noted, which indicates the development of active arterial hyperthermia during ozonation, which enhances tissue nutrition and improves metabolic processes in them. When carrying out the traditional method of treatment, the temperature in the ear increases slightly. After completion of the course of treatment, a decrease in local temperature was noted, which is confirmed by the subsidence of inflammatory phenomena after treatment.

The contents of the ear were characterized by a variety of microbial flora. Microbiological studies revealed changes in the microbial landscape of the ear, which was reflected in the absence of pathogenic flora in 14 of 15 patients in the main group. This indicates the effect of ozone and laser therapy. In the control group, flora was absent in 8 out of 15 examined patients.

Thus, the results of treating patients with CHSO using ozonation indicate the high effectiveness of this method. The use of an ozonized solution of decasane and laser therapy helps to increase the effectiveness of treatment of patients with CHSO.

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