



EVALUATION OF THE EFFECTIVENESS OF COMPLEX APPLICATION OF OZONE IN CHRONIC SUPPURIOUS EAR DISEASES

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<https://doi.org/10.5281/zenodo.14192074>

ARTICLE INFO

Qabul qilindi: 10-Noyabr 2024 yil

Ma'qullandi: 15-Noyabr 2024 yil

Nashr qilindi: 20-Noyabr 2024 yil

KEYWORDS

chronic purulent otitis media, otoscopy, ear endoscopy, transtymponal otitis, ear lavage, ozone, laser therapy.

ABSTRACT

Development of modern methods in treatment of chronic suppurative otitis media (CSOM) is one of the urgent problems of modern otology. Among various methods of treatment of chronic suppurative otitis media at present is a rational combination of general measures of influence on the body with local treatment. A comparative analysis of the level of efficiency of action of 0.002% decasan solution in combination with O₃ and radiation of an IAG-No laser in special therapeutic modes is carried out, the advantage of this technique and its mechanism are described. The results of treatment of 30 patients are presented. All patients underwent washing of the middle ear cavity with antiseptic solutions with subsequent introduction of decasan solution alternating in combination with oxygen and an IAG-No laser. Despite this, in patients of group 1 (12% of patients), group 2 (4.56% of patients), group 3 (31% of patients) a short-term effect with subsequent recurrence of the disease was noted.

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 Оз 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.

Chronic inflammatory diseases of the mucous membrane of the tympanic cavity and other formations related to the middle ear system are the most common diseases [1]. Despite scientific advances aimed at diagnostics, treatment and prevention of chronic purulent otitis media (CPOM), their incidence not only does not decrease, but also tends to increase in recent years [1,3]. The main principle of conservative treatment of CPOM, as well as other focal infections, is a rational combination of general measures of influence on the body with local treatment. The former should be aimed at eliminating the general infection in CPOM and increasing the body's immunological strength. Local treatment consists of creating optimal conditions for elimination in the focus of inflammation, suppression of local infection and stimulation of reparative processes [4,7].

The effectiveness of CPOM treatment largely depends on the bactericidal action of various drugs used for administration into the tympanic cavity (TC). Many patients suffer from intolerance to various medications or the flora of the cavity is insensitive or resistant to most antibacterial drugs used for treatment. Drug-resistant microflora is the cause not only of increased treatment duration, but also of 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 chronic gastroesophageal reflux disease and to develop optimal methods for their use.

Taking into account the above, we found it interesting to study the effect of medical ozone (O₃), ozone-containing drugs in the treatment of chronic otitis media both as an independent remedy and in combination with decasan solution 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, and promotes epithelization. However, there is no information on the most appropriate time for O₃ to act on various microbial factors, its effect on various microbial populations depending on time, and in combination with antibiotics. Laser allows you to stop signs of inflammation, stimulate proliferation. We observed 30 patients with chronic otitis media.

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 edematous, and abundant mucopurulent discharge was noted. The bacteriological studies we conducted showed that in the majority (80%) of cases, both in patients with chronic gastritis and otitis media, staphylococcal flora was detected, including *Staphylococcus epidermidis*, *staphylococcus viridians*, *staphylococcus aureus*, *staphylococcus haemolyticus*, *staphylococcus pyogenes*, as well as β -hemolytic streptococcus group A, etc. Depending on the treatment method, patients were divided into three groups.

Group 1 included 14 patients with chronic otitis media who tolerated antibacterial drugs poorly or not at all. They underwent rinsing of the external auditory canal with a 1:5000 furacilin solution 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 decasan. Irradiation was carried out with a YAG-No laser. Group 3 was a control group and consisted of 13 patients who underwent traditional therapy, rinsing the ear with a 1:5000 furacilin solution according to the standard treatment method. For 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. A solution containing ozone at a concentration of 600 µg/l was obtained during five-minute bubbling. Only freshly prepared ozonized solution was used for treatment. To introduce the medicinal substance into the middle ear cavity, a disposable sterile syringe (5 ml for treating otitis), a 4 cm long piece of plastic connecting tube from an intravenous infusion system, and a mobile obturating balloon with a non-return valve or an inflatable rubber cuff of any other design suitable for the lumen of the external auditory canal are required. The medicinal substance is preheated in a water bath.

To perform the treatment, first, the end of the connecting tube is hermetically fixed in the external auditory canal with a movable occluding balloon. 5 ml of preheated ozonized solution is drawn 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 "towards you", which reduces the pressure in the external auditory canal. Air begins to flow into the auditory canal and 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 the treatment, the patients of the second group underwent 5 procedures of deep ozonation of the middle ear cavities in a controlled baroregimen. The procedure was performed daily for 5 minutes. Dosage 6 mcg / l per minute. One session at a concentration of 6 mcg / l. min. for 5 minutes. Amounts to 30 mcg / l. Irradiation of the YAG-No laser was carried out in special therapeutic modes. The duration of treatment depended on the dynamics of the disease but no more than 5-6 procedures. Intolerance in patients to medicinal preparations and ozone therapy was not observed.

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

The results of treatment were assessed based on the amount of rinsing, 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, cessation of vision from the ear, persistent remission of the inflammatory reaction and stimulation of regeneration elements, normalization of functional and laboratory studies.

We considered "improvement" to be a condition when the general well-being of patients normalized, headaches ceased, discharge from the ear decreased, hearing improved. The absence of significant changes in the course of the disease or the onset of short-term improvement followed by a relapse of the disease were assessed by us as "lack of effectiveness". There was no deterioration of the disease in any case. Data on the effectiveness of treatment are presented in the table.

Table 1

Results of treatment of patients with chronic gastroesophageal reflux by the method of intraoral ozonation with laser therapy

Group of patients	Treatment effectiveness	ChGRM	

First	Recovery		7 (70%)
	Improvement		2 (20%)
	No effect		1 (10%)
Second	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 chronic otitis media is the number of BP lavages, transtymponal administration of drugs and the time of ozonation necessary to achieve a therapeutic effect.

The time of the tip and the number of lavages with subsequent ozonation of the ear in the 1st main group with chronic otitis media 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 of the control group, the number of lavages through the tip and the introduction of decamitoxinum solution was with chronic otitis media. Mesotympanitis 5.0 ± 0.58 , and with epitympanitis - 6.53 ± 0.54 .

Disappearance of clinical manifestations of the disease with chronic otitis media. 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 chronic otitis media. Epitympanitis - after 7.3 ± 0.2 days, and in the control - after 14.2 ± 0.2 days. With combined treatment with decamitoxin solution and O3, a reduction in the duration of treatment for both mesotympanitis and epitympanitis by 2 times compared to the control group was noted. As for the effectiveness of treatment, normalization, as well as significant improvement in hearing function, corresponded to "clinical recovery and improvement." In a comparative analysis of the cessation of mucopurulent discharge in patients of the main groups and the control group, statistically significantly better results were noted in the former.

When studying temperature shifts in tissues in the mastoid process region before and after the first procedure using O3, both with and without antibiotics, an increase in temperature was noted, which indicates the development of active arterial hyperthermia during ozonation, which promotes increased nutrition of tissues and improved metabolic processes in them. When conducting a traditional method of treatment, the temperature in the ear increases slightly. After the end of the course of treatment, a decrease in local temperature was noted, which confirms the abatement of inflammatory phenomena after the 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 expressed 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 of 15 examined patients.

Thus, the results of treatment of patients with chronic gastritis using ozonation method indicate high efficiency of this method. Application of ozonized solution of decasan and laser therapy contributes to increase of efficiency of treatment of patients with chronic gastritis.

References:

1. Карпова Е.П., Вагина Е.Е., Тулупов Д.А. Сравнительный анализ видового состава микрофлоры носоглотки и потогенной флоры среднего уха при хроническом воспалении // Вестник оториноларингологии. - Т.2 - С.242-244.
2. Бактериологическое исследование и антибактериальная терапия при хронических гнойных мезатимпанитах // Е.Ю. Масенко (и др.) // Новости оториноларингологии - 2000 - 16с.
3. Батенева Н.Н. Озонотерапия гнойных средних отитов: автореф. дис. канд. мед. наук. - Воронеж. 2000. - 16с.
4. Камалова З.З. Оптимизация диагностики и хирургического лечения больных хроническим средним отитом: автореф. дис. ... канд. мед. наук. - М., 2009. - 24с.
5. Комплексный подход к лечению больных хроническим средним отитом (Сообщение 1) В.В. Дворянчиков (и др.) // Рос. Оториноларингология. - 2004. - №6. - С.10-14.
6. Синькин Э.В. Лечение больных острыми и хроническими гнойными заболеваниями среднего уха с использованием препаратов озона // Вестн. оториноларингологии. - 2009. - №3. - С.34-35.
7. Mann W / Treatment of vascular lesions with Lasers. - Germany. - P.234.
8. Шаматов, И., Каримов, З., Шопулотова, З., & Махмудова, С. (2021). ВОЗМОЖНОСТИ КОМПЬЮТЕРНОЙ И МАГНИТНО-РЕЗОНАНСНОЙ ТОМОГРАФИИ В ВИЗУАЛИЗАЦИИ ПОЛОСТИ НОСА И ВЕРХНЕЧЕЛЮСТНОЙ ПАЗУХИ. Журнал вестник врача, 1(2), 113-115.
9. Исламов, Ш. Э., Шаматов, И. Я., Шодиев, А. Э., & Шербекоев, Б. Э. (2020). Дефекты оказания медицинской помощи в практике оториноларингологии. Достижения науки и образования, (4 (58)), 50-53.
10. Шаматов, И. Я., Болтаев, А. И., Шадиёв, А. Э., & Кодиров, О. Н. (2017). Эндоскопическая диагностика и лечение деформации носовой перегородки и гипертрофии нижних носовых раковин. In International Scientific and Practical Conference World science (Vol. 5, No. 5, pp. 61-63). ROST.
11. Шаматов, И. Я., Хушвакова, Н. Д., Шодиев, А. Э., & Курбанов, Э. Х. (2019). Комплексное лечение хронического риносинусита в стадии обострения. Re-health journal, (2), 5-10.
12. Shamatov, I., Karabaev, N., Nasretdinova, M., & Nabiev, O. (2021). New in the vestibular rehabilitation of patients with dizziness. Annals of the Romanian Society for Cell Biology, 99-103.
13. Шаматов, И. Я., Болтаев, А. И., & Расулова, М. Р. (2022). ИММУНОБИОХИМИЧЕСКИЕ СДВИГИ ПРИ СЕЗОННОЙ БИЦИЛЛИНОМЕДИКОМЕНТОЗНОЙ ПРОФИЛАКТИКЕ ХРОНИЧЕСКИХ ТОНЗИЛЛИТОВ В САНАТОРНЫХ УСЛОВИЯХ. In Проблемы постковидной оториноларингологии (pp. 284-286).
14. Исламов, Ш. Э. (2014). ДЕФЕКТЫ МЕДИЦИНСКОЙ ПОМОЩИ В РАЗРЕЗЕ МЕСТ ДОПУЩЕНИЯ. Новый день в медицине, (1), 62-65.
15. Исламов, Ш. (2012). Дефекты лечения и диагностики в акушерстве и гинекологии. Журнал вестник врача, 1(3), 68-71.

16. Исламов, Ш. (2011). Дефекты оказания медицинском помощи в деятельности педиатров. Журнал вестник врача, 1(2), 79-83.
17. Исламов, Ш. (2010). Дефекты лечения при оказании медицинской помощи. Журнал проблемы биологии и медицины, (2 (61)), 80-86.
18. Исламов, Ш. Э., & Хушвакова, Н. Ж. (2010). Дефекты медецинской помощи в деятельности оториноларингологов. Российская оториноларингология, (4), 20-24.
19. Исламов, Ш. Э. (2010). АСПЕКТЫ МЕДИЦИНСКОГО ПРАВА И ЭТИКИ. ЖУРНАЛ, 140.
20. Исламов, Ш. Э., & Хушвакова, Н. Д. (2010). «Оборонительная позиция» медицинских работников в оториноларингологии. Российская оториноларингология, (6), 26-30.
21. Исламов, Ш. Э. (2009). Проведение судебно-медицинской экспертизы при профессиональных правонарушениях медицинских работников. In О проблемных вопросах в организации производства судебно-медицинских экспертиз (pp. 36-39).

