

Use of Ozone Therapy in the Treatment of Diseases of the Mucous Membrane of the Oral Cavity

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Abstract: Ozonotherapy has been used in medicine for many years to treat and prevent diseases of internal organs. It has found application in such fields of medicine as gynecology, urology, immunology, venereology, cosmetology, and dentistry. This method of treatment is combined with other methods or used separately. Important to know Methods based on the use of this gas have been used around the world for over 50 years. Initially, ozone was used to treat purulent, colds, viral diseases, burns, skin damage, even to stop bleeding. It quickly disperses throughout the body, delivering nutrients and water to the cells. It is this property of gas that formed the basis of the method.

Keywords: dentistry, oxygen, osteomyelitis, periodontitis, maxillofacial, stomatitis.

Positive changes that occur in the body with the qualified use of medical ozone are often observed in dental practice. Ozone therapy significantly enhances the effect of therapeutic measures for various diseases and conditions of the oral cavity:

Gingivitis;

Stomatitis of bacterial, viral or fungal etiology

Periodontitis;

Diffuse infectious processes of the maxillofacial area;
periostitis and osteomyelitis of this area;

For the prevention of complications during prosthetics.

The influence of ionized oxygen takes energy metabolism in tissues to a qualitatively new level. Microcirculation is normalized, cellular and humoral immunity is activated. In addition, ozone has a detrimental effect on pathogens. Such properties of ozone make its use in dentistry very relevant. The decisive role in the effectiveness of physiotherapeutic treatment belongs to the professionalism and qualifications of doctors.

Treatment of gum diseases Ozone therapy is effective in the fight against gingivitis and periodontitis. Treatment of canker sores and herpes Ozone is highly effective for treating aphthae with stomatitis and herpes.

How is therapy carried out? when using ozone

The doctor brings the tip of the device to the tooth cavity or soft tissues and delivers ozone through the silicone cap. The gas operates for 30–40 seconds, during which time it sterilizes the selected area. Ozone eliminates up to 90% of pathogenic bacteria, thereby restoring the health of your tooth.

What is it based on? healing effect of ozonation Ozone in the form of gas penetrates into the microscopic structures of the tooth. Pathogenic bacteria are completely destroyed.

The versatility of the technique provides a wide choice of means to achieve positive changes in the diseased area. In the dental industry, ozone therapy can be used in the form of general (systemic) and local (local) procedures

Intravenous administration of saline solution saturated with ozone in the treatment of dental diseases. For the first option, intravenous or intramuscular administration of a physiological solution enriched with ozone in certain concentrations is provided. Typically, the saturation level is 1200–1500 mcg of ozone per 1 liter of liquid. The volume of one infusion is 200–400 ml of saline solution.

For local dental diseases, local treatment can be used. In this case, ozone therapy is carried out by rinsing. To do this, ordinary distilled water is saturated with ionized oxygen, the enrichment level is 20 mg of ozone per 1000 ml of liquid. In the presence of severe or chronic dental diseases, there is a need for a combination of local and systemic treatment methods.

In certain pathological conditions, autohemotherapy is prescribed with ozonation of a portion of blood before intramuscular administration. More often it is possible to limit yourself to a short scheme. The versatility of ozone therapy allows the use of rectal insufflations when full parenteral treatment is not possible.

Typically, the average scheme involves 2–5 sessions per week. It depends on the type of procedure: systemic – less often, local – more often. Most of the details are decided on an individual basis, taking into account the characteristics of the body and the course of the disease in an individual patient.

In the treatment of dental pathology, ozone therapy has many negative effects: systemic blood circulation increases; accelerates physiological epithelization of the skin and the rotovoy layer; umenshaet risk of infectious diseases in surgical interventions; suschestvenno snyaet medikamodoznuyu nagruzku na patienta; inogda na nedelyu uskoryaet srastanie perelomov cellusti.

This list contains only those changes that are observed after a short period of time, but it is not limited to them. In addition, positive changes largely depend on the professionalism of the specialists who prescribe and carry out treatment.

After a course of ozone therapy at the Bilyak clinic for dental diseases, a positive effect is observed for a long time. Therefore, after the main course of treatment, the need for repeated sessions arises only after a few months. In some cases, you can refuse them altogether.

Ozone has been successfully used in medicine for over 100 years due to its microbiological qualities. Its powerful oxidation impact, which results in the production of free radicals, and its ability to cause the direct death of nearly all microorganisms is the basis for its bactericide, virucide, and fungicide properties. Ozone also has a medicinal impact that speeds up blood flow and aids wound healing. Ozone may be applied as a gas or dissolved in water for medical purposes. Despite the benefits of using ozone therapeutically, concerns about its use in dentistry still exist. We aimed to provide a summary of the current uses of ozone in medicine and dentistry. An electronic search was performed for all English scientific papers published between 2012 and 2023 using PubMed, Cochrane, and Google Scholar search engines. Ozone, clinical applications, medicine, and dentistry were the search terms used. Seventy full-text articles describing the use of ozone therapy in medicine and dentistry were included in the present review. Ozone has shown several beneficial effects in the medical field. However, despite the encouraging *in vitro* evidence, the clinical use of ozone in dentistry has not yet been demonstrated as highly effective. We demonstrated that ozonated sunflower oil is effective at killing the biofilms formed by *Candida* species, by the bacterium *Streptococcus mutans*, or by both microorganisms that can interact in the oral cavity, making it a potential therapeutic option for the treatment of these infections.

Ozone therapy is an alternative medical treatment that introduces ozone or ozonides to the body. The United States Food and Drug Administration (FDA) prohibits all medical uses of ozone "in any medical condition for which there is no proof of safety and effectiveness", stating "ozone is a toxic gas with no known useful medical application in specific, adjunctive, or preventive therapy. In order for ozone to be effective as a germicide, it must be present in a concentration far greater than that which can be safely tolerated by man and animals."

Ozone therapy has been sold as an unproven treatment for various illnesses, including cancer, a practice which has been characterized as "pure quackery". The therapy can cause serious adverse effects, including death.

A total of 487 potentially relevant records were retrieved as a result of the literature search. The number of studies decreased to 389 after duplicate removal, which was performed using the Rayyan software algorithm (48). Handsearching was conducted by manually screening the references of the considered studies to identify possible additional relevant papers.

The key references considered in the present review are listed in Table I. Of these studies, 16 were in vitro studies, seven were based on animal models including one with an additional human clinical phase, one was designed as a human ex vivo study and one was a review. In the field of dentistry, the main beneficial effects of ozone could be summarized in the following domains: Antimicrobial activity, remineralization through direct interaction with hard dental tissues, immunomodulation and biostimulation of dental and periodontal cells

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