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Therapeutic potential of ozone therapy as an adjunct treatment in the healing of oral cavity wounds in patients with type I and II diabetes mellitus: a review. of literature

Therapeutic potential of ozone therapy as an adjuvant treatment for oral wound healing in patients with type I and II diabetes mellitus: A literature review

Therapeutic potential of ozone therapy as an adjunctive treatment for the healing of oral cavity wounds in patients with type I and II diabetes mellitus: a bibliographic review

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ABSTRACT: Diabetes mellitus is a highly prevalent chronic disease characterized by persistent hyperglycemia, which results in greater difficulty in healing skin lesions.
Ozone therapy is an alternative therapeutic technique that possesses analgesic, anti-inflammatory, and healing properties. This study aimed to evaluate the scientific evidence on the benefits of ozone therapy in wound healing in diabetic patients, associating its effects with reduced morbidity, decreased recovery time, and...

Improving quality of life. To this end, a narrative literature review was conducted on studies addressing ozone therapy in the treatment of wounds in diabetic patients. The search was carried out in the PubMed, SciELO, and Lilacs databases. The inclusion criteria encompassed publications in Portuguese and English, from 2020 to 2025, with an emphasis on studies addressing the specific theme. The results showed that ozone therapy is effective in treating the healing of oral wounds in diabetic patients. Finally, it is concluded that ozone therapy brings benefits to the tissue repair process in oral wounds and lesions of patients with diabetes mellitus, and that combinations with conventional treatments can optimize tissue repair results.

Keywords: ozone therapy. Diabetes Mellitus. Wound healing. Oral cavity.

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ABSTRACT: Diabetes mellitus is a chronic, highly prevalent disease characterized by persistent hyperglycemia, which results in greater difficulty in the healing of skin lesions.
Ozone therapy is an alternative therapeutic technique that possesses analgesic, anti-inflammatory, and wound-healing properties. The objective of this study was to evaluate the scientific evidence regarding the benefits of ozone therapy in wound healing in diabetic patients, linking its effects to reduced morbidity, shorter recovery time, and improved quality of life. To this end, a narrative literature review was conducted on studies addressing ozone therapy for wound treatment in diabetic patients. The research was conducted using the PubMed, SciELO, and Lilacs databases. The inclusion criteria encompassed publications available in Portuguese and English from 2020 to 2025, with an emphasis on studies addressing the specific topic. The results showed that ozone therapy is effective in treating oral wounds in diabetic patients. In conclusion, ozone therapy benefits tissue repair in oral wounds and lesions in patients with diabetes mellitus, and combining it with conventional treatments can optimize repair outcomes.

Keywords: Ozone therapy. Diabetes Mellitus. Healing. Oral cavity.

1 INTRODUCTION

Diabetes mellitus (DM) is a metabolic disease directly associated with levels
High blood glucose levels, classified into types I and II. DM affects a large part
of the world's population — approximately 387 million — and it is believed that, by 2035, this number will increase.
The number of people with diabetes is projected to reach 471 million, according to the Brazilian Diabetes Society.
They present difficulties in wound healing, which makes the management of these wounds more challenging.
complex, especially when there is an associated infection. Due to its high mortality rate, the
Diabetes is characterized as a major health problem worldwide (Costa *et* al.,
2022; Silva *et* al., 2022; Miranda *et* al., 2022).

Oral manifestations in diabetics are determined by glycemic control.
Patients, and even those who maintain good oral hygiene, are prone to lesions, since
Its occurrence can affect approximately 80% of patients with DM. The most common oral manifestations...
Frequently encountered conditions include periodontal disease, candidiasis, halitosis, xerostomia, and glossitis.
benign migratory, glossodynia and ulcers (Thomes *et* al., 2021; Guimarães *et* al., 2022).

Other oral changes that can also be found in diabetic patients
These include alveolar resorption, coated tongue, periodontal abscess, tooth mobility, and increased...
of the parotid glands, tendency to secondary infection, and delayed tissue repair.
(Fonseca, 2025).

Wounds are defined as the discontinuity or loss of integumentary tissue.
represented not only by the total or partial rupture of the various layers of skin – tissue
epithelial, connective, and adipose tissue – but also because they reach deeper structures, such as

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tendons, muscles, subcutaneous tissue, and bones. They are categorized according to the degree of complexity, depth and extent, with etiological factors including ulcers, burns, traumas, surgeries, among others (Santos, Santos & Libório-Lago, 2024; Marchesini & Ribeiro, 2020).

Wound treatment can be challenging for those affected, especially when the condition becomes chronic. In this situation, the lesion does not naturally evolve into a... hemostasis, inflammation, proliferation and remodeling, which may progress to infection, hypoxia and biofilm formation. The treatments usually performed are: wound hygiene, application of polyhexanide (PHMB), application of acetic acid, application of antimicrobials Topical treatments, vitamin replacement, and the use of aloe vera. Ozone therapy is an integrative practice. It complements existing treatments and aims to promote an environment antioxidant, anti-inflammatory, angiogenic and antimicrobial in the lesion area (RIZZO *et* al., 2026).

Ozone (O3) is a gas composed of three oxygen atoms (O2), generated by radiation. UV radiation or electrical discharges, and it is considered one of the most powerful natural oxidants. potent. It exhibits immunomodulatory, antifungal, antimicrobial, and antiviral action, with ability to destroy the cell wall of microorganisms and inactivate their genetic material (Sá, 2021; Meligy, Elemam & Tallat, 2023).

The World Health Organization (WHO), through Ordinance No. 702, of March 21 In 2018, the Ministry of Health (MS) included ozone therapy as a practice in the Policy. National Policy on Integrative and Complementary Practices (PNPIC). Ozone therapy is a practice It is safe and contributes positively to the treatment of various pathologies and infections. recurring, for pain relief and to accelerate wound healing (Almeida *et* al., 2025; Costa *et* al., 2022).

Ozone therapy can be administered intramuscularly, rectally, intravenously, subcutaneously, or topically. It acts against fungi and bacteria that lack a protective system against this aggression. Oxidative. It consists of a minimally invasive method that shows potential to provide analgesia in most cases, with few reports of complications, being indicated in treatment of infections, chronic pain and wounds (Silva *et* al., 2025).

Ozone therapy offers benefits in the treatment of injuries due to its... ability to sterilize water, to exert a germicidal effect, to activate platelets and to inactivate It fights viruses, fungi, protozoa, and yeasts. Furthermore, it strengthens the immune system and eliminates... microorganisms that can cause infections and stimulate tissue oxygenation (Rocha *et* al.,

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2024; Miranda *et* al., 2022).

Finally, ozone therapy optimizes the tissue repair process, reducing the size.
of the wound, infections and healing time. Consequently, it reduces complications.
resulting from diabetes mellitus and improving the quality of life of affected individuals (Galvão,
2024). The dentist must be aware of the numerous oral manifestations of DM and the
The clinical management of these patients should be directed towards preserving homeostasis, since the
Changes in the oral environment influence glycemic control (Fonseca, 2025).

2 LITERATURE REVIEW

2.1 Diabetes Mellitus

Diabetes mellitus is a chronic disease of great relevance worldwide and
This constitutes a public health problem of great importance. It is a disorder.
A metabolic disorder resulting from a defect in the production or release of insulin, which leads to
alterations in the metabolism of proteins, carbohydrates, and lipids, with a consequent increase in
glucose concentration in urine and blood (Jurado *et* al., 2025; Thomes *et* al., 2021).

Diabetes mellitus (DM) is classified into type 1 and type 2. Type 1 diabetes mellitus (DM1) is caused by...
autoimmune destruction of pancreatic beta cells, resulting in total deficiency in
Type 2 diabetes mellitus is characterized by impaired insulin production and is more prevalent in children and young people.
(DM2) is associated with genetic, social and lifestyle factors, such as being overweight,
obesity, high blood pressure, sedentary lifestyle, smoking, high-calorie diet and
hypercholesterolemia, being more commonly observed in adults (Marques *et* al., 2020;
Jurado *et* al., 2025; Fernandes *et* al., 2022).

The main characteristic of diabetes mellitus is persistent hyperglycemia, resulting from
a failure in insulin production, a deficiency in its action, or both, resulting in
Complications may develop over time. Diagnosis is made based on blood tests.
that show elevated blood glucose levels, such as the oral glucose tolerance test (OGTT),
fasting plasma glucose (FPG) and glycated hemoglobin (HbA1c) (Santos, Santos &
Libório-Lago, 2024).

Over time, this disease can trigger serious health problems, such as
Changes in blood circulation in the upper and lower limbs, stroke.
Cerebral hemorrhage (stroke), retinopathy, heart attack, ulcer formation and tissue damage, which can lead to
to necrosis. Treatment of this comorbidity is based on controlling blood sugar levels,

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through dietary modifications, insulin therapy, and the use of oral medications or intramuscularly (Araújo *et* al., 2020; Liu *et* al., 2023).

2.2 Ozone

Ozone is a gas present in the atmosphere, composed of three oxygen atoms in a It has a cyclical structure and is indicated as a therapy against various pathologies due to its excellent properties. It has properties such as antimicrobial action and antioxidant function. It should not be used in its raw form. Pure oxygen requires use in conjunction with pure oxygen, avoiding reaction with other gases, which may be toxic. It is necessary that the O3 exhibit variations in oxygen and other concentrations. ozone up to 95% for O2 and 5% for O3 (Moraes & Teixeira, 2022; Costa *et* al., 2022; Meligy, Elemam & Tallat, 2023).

It is a potent antioxidant that increases the flexibility of erythrocytes and improves... blood oxygenation, facilitating the passage of red blood cells through the capillaries. In addition, it acts... As an analgesic and anti-inflammatory, it decreases platelet adhesion and promotes the formation of granulation tissue and, when in contact with organic fluids, encourages the formation of Reactive oxygen molecules, which trigger biochemical events in cellular metabolism, resulting in beneficial effects on tissue repair (Marchesini & Ribeiro, 2020).

Ozone is commercially available for sale in gaseous form. Ozone, ozonated water, and ozonated oil, which can be administered alone or in combination. Association. Ozone in gaseous form is used for asepsis prior to treatments. ozonated water is used in endodontic and restorative procedures, and in oral surgeries for hemostasis. Periodontal diseases and canker sores. Ozonized oil, on the other hand, is used for ulcers and fungal infections and not... It has contraindications for its use. Ozone therapy is low-cost and minimizes the risk of complications. Expenses related to dressings, consultations, medications, and surgeries, in addition to being an easy treatment. application and non-invasive (Santos *et* al., 2022; Meligy, Elemam & Tallat, 2023).

2.3 Ozone Therapy

Ozone therapy is an unconventional treatment that uses a mixture of gases. O2 and O3, used alone or in combination. Topical application is indicated for asepsis. the treatment of wounds and ulcers, due to its bactericidal, disinfectant and... fungicides. The O2-O3 gas mixture is indicated for wound healing (Pinheiro &

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Barbosa, 2021).

The use of ozone for therapeutic purposes began in the 19th century and gained great importance.
popularity during World War I, when German doctors began to
to use it in the treatment of post-traumatic gangrene in soldiers. From that period onwards, the
Ozone therapy has become widely studied due to its anti-inflammatory effects.
anti-inflammatory, analgesic and healing properties, and is currently recognized as a practice
complementary in the health field (Almeida *et* al., 2025; Sá, 2021).

In dentistry, ozone therapy began to be used in 1934 by...
Dental surgeon Edward Frish, who applied ozonated water in the treatment of abscesses.
periodontal, with the aim of increasing oxygenation of the affected area and, simultaneously,
to promote the tissue repair process. Over the years, the technique has become recommended.
in various dental specialties, in both chronic and acute cases, being
considered conservative and minimally invasive (Almeida *et* al., 2025; Sen & Sen, 2020).

In the current dental context, this therapy can be used in various areas, such as...
Periodontics, restorative dentistry, cases of periodontal pockets, cases of peri-implantitis and dysfunctions.
Temporomandibular disorders (TMD). It is also indicated in the treatment of inflammations and infections.
minimally invasive, and can be administered as a mouthwash or in oil for treatment.
of herpes simplex or even in gaseous form (Fernandes *et* al., 2021).

Ozone therapy is not suitable for all cases. In patients with comorbidities or
transient conditions, such as heart problems, uncontrolled diabetes mellitus, pregnant women,
women during breastfeeding, alcoholism, uncontrolled high blood pressure,
glucose-6-phosphate deficiency, myasthenia gravis, decompensated hyperthyroidism, anemia
In cases of severe thrombocytopenia and bleeding from any organ, ozone therapy is contraindicated.
(Sen & Sen, 2020; Sfalcin, Marques & Ribeiro, 2022).

Despite all the benefits of ozone therapy, it is worth noting that, if used in doses
Very high levels can be harmful to the body due to their ability to stimulate...
controlled and moderate oxidative stress when used in inappropriate doses (Araújo *et al.)*
al., 2020).

2.4 Ozone therapy for oral cavity wounds in diabetic patients

Ozone therapy has been widely used in the treatment of wounds as a therapeutic method.
This is an alternative because it is low-cost, there are no reports of toxicity or side effects, and it presents...

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improvement in the patient's clinical condition. For this to happen, the professional must be qualified and possess good skills.
knowledge about this practice (Freire & Invention, 2023).

Injury to epithelial tissue triggers a series of events that promote the process.
of tissue repair and healing. Healing consists of a sequence of steps.
complex processes, such as hemostasis, inflammation, proliferation, and remodeling. These
The processes involve the presence of various cells and proteins of the extracellular matrix, as well as
of cytokines and growth factors. As for tissue repair, often referred to as "healing,"
It is based on restoring the architecture and function of tissues after damage to them.
(Santos, Santos & Libório-Lago, 2024; Dias *et* al., 2021).

Each wound has a healing time that encompasses numerous aspects, such as the type
wound (vascular insufficiency, arterial insufficiency, diabetes, tumors, neuropathy, arthritis)
rheumatoid arthritis, chronic osteomyelitis, burns, trauma, infection, pressure, and other diseases.
hematological factors); patient hygiene conditions, financial situation, clinical conditions.
(comorbidities, age) and type of treatment. Wound healing encompasses a process
The reparative process is composed of the inflammatory, proliferative (angiogenesis), and synthesis phases of
collagen (matrix deposition) and epithelialization (Moraes & Teixeira, 2022).

Diabetic patients are more susceptible to developing infections in
Oral cavity infections, both bacterial and fungal, occur due to reduced salivary flow.
A deficiency in metabolism, associated with a compromised defense mechanism, contributes
for the appearance of infections, with candidiasis being frequently found in the oral cavity.
Oral. Lesions related to candidiasis include angular cheilitis and rhomboid glossitis.
median and stomatitis caused by the use of complete dentures (Fernandes *et* al., 2022).

Reduced saliva production increases the risk of infections, gradually leading to the development of...
Some oral manifestations in diabetic patients, which are not limited to manifestations
local, but also systemic. The dentist should be part of the multidisciplinary team.
providing care to individuals with DM, due to the importance of oral health in influencing
metabolic effects on improving glycemic control (Ferreira *et* al., 2021).

DM presents with aggravating factors such as the development of tissue lesions and ulcers. O3
It tends to restore the diabetic patient's body, as it helps maintain levels.
Insulin use and in reversing more severe cases of diabetes, delaying the harmful effects of...
pathology (Leite *et* al., 2024).

Ulcers and wounds in diabetic patients can begin as a result of
Peripheral neuropathy, related to a reduction in the neuroendocrine response, culminating in

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The appearance of infections and ulcerations secondary to the lesions. Generally, these lesions are colonized by microorganisms from the surrounding skin microbiota, the most prevalent being Streptococcus *spp.* And *Staphylococcus aureus* (Machado *et* al., 2020; Pinheiro & Barbosa, 2021).

Chronic wounds are usually more complex, as they require a longer healing period. for wound healing and are frequently related to the comorbidity of diabetes mellitus. The consequences of injuries include suffering, loss of self-esteem, discomfort, and expenses. financial and psychosocial problems for both family members and the patient. The rates The recurrence rate of wounds in diabetic patients is around 70%, and a large part of these Infections are caused by polymicrobial colonization (Pontes *et* al., 2020; Pinheiro & Barbosa, 2021).

The application of ozonized oil accelerates the healing of acute skin wounds by through the proliferation of fibroblasts and collagen synthesis in the affected area. O3 can be Used in wound irrigation, as it promotes tissue regeneration by stimulating the vascularization and increased oxygenation of the area. The use of ozone as an antiseptic in Wound irrigation also contributes to tissue repair (Santos *et* al., 2022).

Ozonized oil may be indicated as an alternative treatment for gingivitis. necrotizing ulcerative, since it reduces the amount of bacteria present in the oral cavity. (Sfalcin, Marques & Ribeiro, 2022). Ionized oil has superior properties to water. Ionized, as it provides an emollient effect due to its affinity with epithelial tissue. In addition to being easy to transport and use, it is necessary to control the degree of peroxidation. because it can affect the effectiveness of the product (Liu *et al.,* 2023).

The application of ozone gas, ozonated water, and ozonated oil has been widespread. It is indicated as an auxiliary method for wound healing, as it shows good effectiveness in controlling... of microorganisms and in reducing recovery time, due to increased concentration oxygen supply to the injury site, which promotes the formation of granulation tissue and speeds up the healing process. wound healing (Archangelo *et* al., 2024).

The use of ozonized sunflower oil results in a higher concentration. approximately 20 to 38% higher than that of pure sunflower oil. This chemical formulation It has a longer-lasting oxygen-releasing effect in injured areas. especially in the treatment of persistent wounds (Marchesini & Ribeiro, 2020; Silva *et* al., 2022).

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Regardless of the etiology of skin wounds in diabetic patients and the form
Through ozone administration, this complementary therapy improves wound healing and
ulcers (Jurado *et* al., 2025).

Systemic oxygen therapy via rectal or intravenous routes may be indicated for the purpose of
to improve systemic effects, such as modulating the inflammatory response and increasing
circulation. The administration of ozonated water and topical application are the most common methods.
used (Ferreira & Camargo, 2025).

The use of ozone depends on the patient's clinical condition and their need for...
to contribute to the regression of pathologies arising from DM. Its proper use brings
benefits to diabetic patients regarding wound healing and, consequently,
promotes a better quality of life (Leite *et* al., 2024).

Infections present in soft tissue and epithelial tissue are a concern for the
health system, since acute skin lesions can become chronic wounds, not
wound healing and can result in morbidity and mortality (Romary *et* al., 2022). O3 improves the
supplying nutrients to the tissue, which in turn strengthens the action of the immune system and boosts
cell multiplication, favoring the maintenance of a controlled microbial load and
healing (Freire & Invention, 2023).

Patients with diabetes mellitus experience slow wound healing due to a lack of
Nutrients. Excess glucose in the blood, combined with reduced circulation and oxygenation.
Blood disorders make these individuals more susceptible to complications arising from injuries.
Ozone therapy aims to restore the body's own conditions by stimulating...
the increase in granulation tissue, improving vascularization of the affected area and,
Consequently, the healing process. The application of ozone presents benefits in
treatment of lesions in diabetic patients, being an effective and safe technique (Leite *et* al.,
2024; Batista *et* al., 2021).

Although it is not a relatively new therapy and shows positive results in
However, further studies and research are still needed to establish its effectiveness, according to literature.
proven, define the type of formulation indicated for each specific case, the frequency of
application, the concentrations of oxygen and ozone in the formulation, in addition to validating its safety.
and develop specific and standardized clinical protocols (Batista *et* al., 2021; Galvão,
2024).

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3 METHODOLOGY

The work consists of a narrative literature review of articles that address the Ozone therapy in the treatment of wounds in diabetic patients. The research was conducted using the PubMed, SciELO, and Lilacs databases, the following were employed. MeSH descriptors: ozone therapy, diabetes mellitus, wound healing, oral cavity, ozone therapy. diabetes mellitus, healing and oral cavity.

The research followed the inclusion criteria of fully available works. in databases, in Portuguese and English, from 2020 to 2025, with an emphasis on studies that addressed the specific topic, clinical case report articles, meta-analyses, studies qualitative and systematic reviews.

The exclusion criteria were based on works published in other languages, texts incomplete, duplicates in databases, in vitro studies, animal research and studies which did not encompass the proposed objective.

In the initial search, 102 studies were found; after applying the criteria of Inclusion and exclusion, and the reading of the articles, 41 were selected for the construction of this Literature review.

4. RESULTS AND DISCUSSION

Diabetes mellitus is a multifactorial disease characterized by a high concentration of blood in children. High levels of glucose in the bloodstream, which can be congenital or acquired. Among the countries with the Brazil has one of the highest rates of diabetes mellitus (DM) incidence, ranking fifth, behind only China, India, the United States, and Pakistan. Approximately 537 million adults are affected. carriers of this disease, of whom 90% have type 2, meaning they acquired it in adulthood, do not insulin dependent (Fernandes *et* al., 2022; Fonseca, 2025).

Ozone has the ability to stimulate the metabolic activity of local tissues. to promote fibroblast cell division and encourage the formation of collagen fibers. Furthermore, enables the secretion of growth factors by fibroblasts and macrophages, which leads to angiogenesis and granulation tissue growth in the repair process. tissue. Ozone therapy is a safe procedure with few adverse effects, capable of considerably reduce the area of wounds and injuries (Costa *et* al., 2022; Jurado *et* al., 2025).

Ozone therapy is proving to be a promising alternative for the treatment of wounds and

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Oral lesions, and can be used in different forms (gaseous, aqueous or oily). Its
The mechanism of action is related to stimulating oxygenation and tissue repair, in addition to...
to exhibit antimicrobial action on the oral flora. These forms of application demonstrate to be
effective in controlling microorganisms such as *Staphylococcus aureus* and *Candida albicans*
(Almeida *et* al., 2025; Archangelo *et* al., 2024; Meligy, Elemam & Talaat, 2023).

Anzolin, Silveira-Kaross and Bertol (2020) observed in their study that ozone, in
Whether in gaseous form or incorporated into oils, it stands out as a treatment for tissue repair.
since it facilitates wound healing, particularly in patients with comorbidities such as
Diabetes mellitus. For aphthous stomatitis, dermatitis, gingivitis, and ulcers, ozonized oil
It contributes to accelerating healing and relieving pain.

Souza and Kurkoski (2020) emphasized that, although ozonated water is somewhat
Although less potent, it can be used as a viable alternative in specific patient cases.
which cannot be subjected to stronger substances. Ozonated water reduces
significantly increased the microbial count. The authors emphasize the need for more
In vitro and clinical research for the standardization of protocols and the definition of concentrations.
ideal, given that scientific evidence is still scarce.

The experimental research with animals, developed by Sanguanini et al. (2020), had
with the objective of evaluating and comparing the effects of ozonated solutions on tissue repair in
Rat wounds. They concluded that ozonated water is capable of enhancing wound retraction.
and collaborate in the maturation and remodeling phase, while ozonized oil facilitates a
elevated neovascularization during the tissue repair phase and increased collagen deposition of
Type I, noticeable from the third week of treatment.

Lima *et al.* (2022) reported that topical ozone is an excellent therapeutic option.
A complementary treatment for skin wounds, with positive results in both the short and long term.
term.

As stated by Santos et al. (2022), the use of ozonized oil on skin wounds
It accelerates the healing of acute injuries because it boosts collagen synthesis and proliferation.
of fibroblasts at the site of the lesion. According to Freire & Invenção (2023), the application of oil
Ozonated alcohol in the oral cavity exhibits beneficial clinical effects resulting from its actions.
Analgesic, antimicrobial, immunostimulant, immunoregulatory, and antioxidant.

Pasek, Szajkowski, Cieslar (2023) established the daily application of ozone, without
The interval between sessions was determined by five sessions, according to the protocol.
excluding Saturdays and Sundays. However, it is important to take into consideration that the

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Daily application, without breaks, is not always applicable, since the centers of attention The service for patients operates during business hours, Monday through Friday, and not always. The patient may attend sessions daily, which could hinder compliance with the daily regime protocol.

From the perspective of Leite *et al.* (2024), the underlying disease, general condition, and age of Patients determine the method of ozone administration and the number of treatment sessions. and the dosage to be used. In turn, increasing the dosage is indicated every five sessions, in variable cycles of 15 to 20 sessions. Generally, from the fifth session onwards, it is observed- The patient's condition improves, and by around the twelfth session, the defense mechanisms... The antioxidants are already activated. The treatment can be performed two to three times a week. The application should be consistent with the needs and clinical condition of each patient. enabling the progressive evolution of treatment and making possible a better quality of life for this individual.

Galvão (2024) suggests applying ozone therapy in concentrations between 40 ÿg/ml and 60 mg/l, as high concentrations could result in toxic effects on tissues, generating local irritation or even delaying the healing process. According to Almeida *et al.* (2025), ozone toxicity depends on individual susceptibility, it is not possible to accurately determine the exposure time and level that could result in a frame of toxicity. However, the maximum recommended dose for ozone administration is 0.01 ppm.

Jurado *et al.* (2025) reported that the use of ozonized oil with a concentration of 0.53 to 17 mg of ozone/g of oil is enough to eliminate adhered cells and destroy biofilms in wounds. of diabetic patients, especially in infections caused by bacterial strains multi-resistant. Therefore, ozone therapy contributes positively to the improvement of microcirculation and re-epithelialization of wound areas in individuals with diabetes mellitus.

The evidence supporting the use of ozone therapy in dentistry is consolidated in various studies in the literature support this, and this therapy aims to eliminate the disease by through a natural immune response and the healing of the organism (Sfalcin, Marques & Ribeiro, 2022; Santos *et* al., 2022). However, further research is needed to create protocols. and/or standardizations regarding dosage, route of administration, and treatment duration, with the aim is to optimize the quality of treatment for oral lesions in diabetic patients (Archangelo *et* al., 2024; Silva *et* al., 2025).

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CONCLUSIONS

The use of ozone therapy as an auxiliary therapeutic modality in the treatment of Treatment of oral wounds in diabetic patients offers benefits ranging from improved healing. tissue healing until the lesion heals, optimizing the overall health of patients and enabling a better quality of life and self-esteem.

The application of ozone to wounds in diabetic patients is recognized for its numerous therapeutic effects and its potential to address various phases of the process of healing. Its anti-inflammatory, antimicrobial, biostimulating and other properties Improved tissue oxygenation is fundamental for wound healing in patients. of diabetes mellitus.

Ozone therapy enhances the healing results of oral lesions. However, so that this therapy can be integrated in a standardized way into clinical practice and in a way To ensure safety, it becomes imperative to focus efforts on defining optimized protocols for... dosage, routes of administration and treatment time, thereby minimizing the impacts. due to the scarcity of data identified in this study.

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