

Ozone therapy in dentistry and in the treatment of temporomandibular disorder

Abstract

The use of ozone in dentistry has gained popularity in recent years due to its antimicrobial, anti-inflammatory, analgesic and biocompatibility properties, as well as being an extremely safe method. The objective of this research is to evaluate the efficacy of ozonotherapy in the treatment of arthralgias and disorders of the temporomandibular joint of muscular order. The objective of this work is to perform a rapid review regarding ozone therapy in dentistry as the main focus in the treatment of temporomandibular disorders.

Keywords: arthralgia, temporomandibular joint, orofacial pain, ozone

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Abbreviations: OZT, ozone therapy; TMD, temporomandibular disorders

Introduction

Ozone therapy (OZT) has been used for therapeutic purposes since the 19th century. The first mention of ozone gas (O_3) was made by the Dutch physicist Martin van Marum in 1785, but it was Christian Friedrich Schonbein in 1840, a professor at the University of Basel who demonstrated changes in the properties of oxygen (O_2) with the formation of (O_3).¹

OZT has been used for many years in medicine, in the treatment of eye diseases (optic neuropathy, glaucoma, retinal changes, such as degenerative diseases, venous obstructions, etc.); in the treatment of acute and chronic bacteria, viral and fungal infections and ischemic diseases, as well as orthopedic, dermatological, pulmonary, renal, haematological, and neurodegenerative diseases.^{2,3}

The extremely important oxidizing property of O_3 , capable of oxidizing almost all surfaces, leading to a higher oxidation stage, is used to increase and stimulate oxygen (O_2) metabolism, improving circulation and interfering with the normal metabolism of pathogenic tumors, for example.^{4,5}

In addition, the biochemical and microbiological studies have established the efficacy of OZT in the reduction of bacteria,^{6,7} because oxygen radicals cause bacterial cell lysis, penetrating the cell membrane, the osmotic control of the cell.⁸

However, its administration must be carried out with caution, since the lining of the mucosal cells of the airways is sensitive to oxidation, therefore, O_3 is irritating to the respiratory system and may induce and promote allergies and asthma, if inhaled directly into high doses.⁹ This underlines the importance of using adequate systems to prevent ozone leakage and avoid harm to the patient.¹⁰ Therefore, the objective of this research is to evaluate the efficacy of ozonotherapy in the treatment of arthralgias and disorders of the temporomandibular joint of muscular order.

Mini review

Ozone therapy in dentistry

OZT in Dentistry falls into the category of new protocols and alternative methods of treatment, but O_3 is not new at all. Ozone therapy is already a great therapeutic alternative in dentistry, mainly in Europe, South America and several other countries.^{11,12}

In dental specialties, OZT is mainly used in periodontics, endodontics and restorative dentistry, due to its properties: antimicrobial, disinfectant, and curative,¹³ as well as recent promising results in the field of oral maxillofacial surgery and in the symptomatology of temporomandibular disorders (TMD), for their analgesic and anti-inflammatory properties.^{3,14}

OZT has already been successful in the treatment of initial carious lesions, cavity, root canals and periodontal pockets healing, improving the healing of epithelial wounds such as ulcerations and herpetic lesions,¹⁵ as well as assisting in disinfection.¹⁶

In oral surgery, OZT can be useful in addition to the inhibition of bacterial growth, it is able to promote an improvement in hemostasis, and in the local O_2 supply.¹⁵ symptoms of pain, trismus and edema, post-extraction of third molars.³

Discussion

Ozone therapy in the TMD symptomatology

Intra-articular administration of ozonated water has been a successful alternative therapy for the treatment of different temporomandibular joint (TMJ) diseases. A randomized controlled study was conducted by Baysan A & Lynch E¹⁶ involving 60 individuals with bilateral internal disarray of the TMJ and disc displacement with reduction, 87% of the patients who received O_3 gas injection in the joint space, recovered completely or presented improvements in the symptoms. However, further clinical and experimental studies are needed to provide direct evidence for its mechanism of action and to sustain the promising results obtained.¹²

The pain felt in the maxilla in the region of the apices of the posterior teeth can originate from infections and inflammations of the maxillary sinus, directly above the dental roots. In these cases, OZT can be applied through ear inflation, as well as by injections of low-concentration ozone gas into loose areolar tissues on buccal surfaces along the wall of the maxillary sinus. 25% of infections of the maxillary sinuses are of fungal origin, O₃ having a high disinfection power, able to overcome the use of drugs.¹¹

Another study compared the efficacy of OZT with the use of pain relieving drugs in patients with TMD, 63 patients were evaluated, 33 treated with ozone therapy and 30 with ketoprofen for 7 days. In this case, it was observed that OZT was more effective than TMJ pain relief medication.¹⁴

Conclusion

Dentistry is changing as we are now using modern science to practice it. Ozone therapy has been more beneficial than present conventional therapeutic modalities and follow a minimally invasive and conservative application to dental treatment. Ozone is a promising treatment modality for various dental problems in future. But, it has to be kept in mind that presently ozone is an adjunct to other conventional treatment modalities and should be used in combination until more research shows benefits in your independent usage.

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Conflict of interest

The authors declare that there is no conflict of interest.

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