The Application of Ozone Therapy in Minimally Invasive Dentistry

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Abstract

Ozone therapy has emerged as a viable treatment option in minimally invasive dentistry, with antibacterial, anti-inflammatory, and analgesic effects. This article examines the use of ozone therapy in dental practice, focusing on its advantages in caries management, root canal treatment, and periodontal therapy. Ozone treatment improves patient outcomes by lowering the need for invasive operations, speeding up recovery, and reducing discomfort. This study seeks to offer a complete overview of ozone therapy's function in modern dentistry, based on current research and clinical data.

Keyward : Ozone Therapy, Minimally Invasive Dentistry, Carious lesions, Streptococcus mutans

Introduction

The search for less intrusive dental treatments has led to the study of ozone therapy, a technology with a long history and potential clinical applications. Ozone (O3) is a strong oxidizing agent noted for its ability to eliminate microorganisms making it an efficient disinfectant. Its use in dentistry, notably to treat primary root carious lesions (PRCLs)[(1)], provides a non-invasive option for preserving tooth structure while efficiently controlling dental caries.

Mechanism

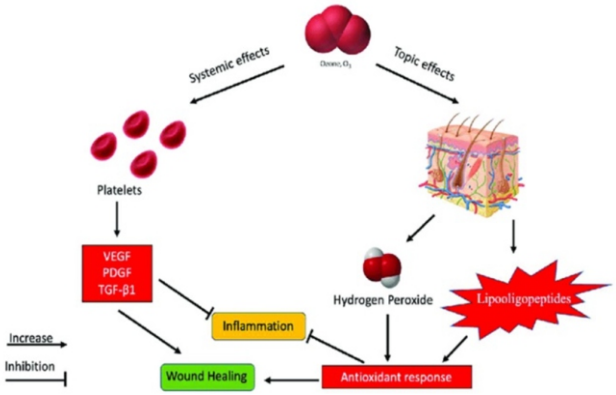

Figure 1: Mechanism of Ozone

Ozone treatment in dentistry is generally performed using ozonated water or gaseous ozone. It works by producing oxygen radicals, which damage the cell walls of bacteria, causing them to become inactive. This biocidal function is especially useful in the oral environment, where bacteria activity is a major concern[(1,5)].

Applications of ozone therapy

Ozone has been used successfully in the treatment of PRCLs. Studies have demonstrated that exposing carious dentine to ozone for brief periods (10-20 seconds) dramatically lowers the presence of harmful bacteria[(1,5)]. This method efficiently treats root caries without requiring considerable drilling, maintaining more of the original tooth structure.

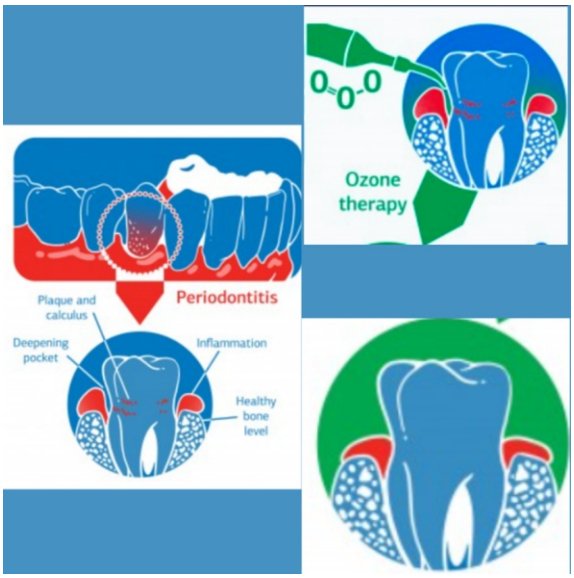

Figure 2: Ozone in Periodontal Therapy

Furthermore, Ozone therapy can complement non-periodontal therapies by lowering bacterial populations and increasing periodontal tissue repair. Studies show that ozone treatment in periodontal pockets can boost the results of traditional therapy by lowering inflammation and speeding up tissue regeneration.[(4)]

The ozone delivery device, such as HealOzone, is intended to provide ozone directly to the afflicted region via a dental handpiece. This technique guarantees that ozone is applied precisely, enhancing therapeutic benefits while reducing exposure to neighboring tissues.[(3)]

Benefits and Clinical Outcomes

Clinical experiments have shown that ozone treatment

reduces microbial burden in carious lesions. In vitro and in vivo research have shown that ozone administration reduces microorganisms such as Streptococcus mutans and S. sobrinus[2,4]. This decrease in microbial activity not only slows the advancement of caries but also promotes remineralization of the tooth structure.Furthermore, ozone treatment is useful for other dental operations, such as tooth extraction and denture cleaning[5]. Ozonated water improves hemostasis and increases local oxygen supply, allowing for speedier healing and minimizing infection risks.

Conclusion

Ozone treatment provides a substantial improvement in minimally invasive dentistry. Its capacity to successfully control dental caries and other oral problems with little intervention is consistent with the ideals of conservative dentistry. As research continues to prove its efficacy and safety, ozone treatment is on track to become a routine component of modern dentistry care, providing a patient-friendly alternative to traditional procedures.

Conflict of Interest: Nil

Source of Support: Nil

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