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INTEGRATED APPROACH TO THE TREATMENT OF PERIODONTAL LESIONS IN SLE PATIENTS: THE ROLE OF OZONE-INDUCED MICROCIRCULATORY CORRECTION

Juraboev Sardor Murodjonovich
Student of the Faculty of Dentistry

Sadullaeva Shakhodatkhon Lutfullaevna
Assistant of the Department of Hospital Dentistry with a Course in Otolaryngology EMU University, Tashkent, Uzbekistan

Abstract

The management of periodontal tissues in patients with Systemic Lupus Erythematosus (SLE) is complicated by systemic immune dysregulation and vasculitis. This study explores a personalized, tiered therapeutic approach using medical ozone and ozonated sodium hypochlorite (NaOCl). By analyzing 122 clinical cases, we demonstrate that a scoring-based differentiated treatment protocol significantly improves local hemodynamics and reduces clinical inflammation. Ultrasound Dopplerography results confirmed a 40% increase in microcirculatory efficiency, establishing ozone therapy as a potent non-pharmacological tool in autoimmune-related dentistry.

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Keywords: Systemic lupus erythematosus, oral mucosa, microcirculation, ozone therapy, periodontitis, sodium hypochlorite, dopplerography, differentiated treatment.

Introduction

Systemic Lupus Erythematosus (SLE) is a quintessential autoimmune disease that manifests in nearly every organ system, including the oral cavity. While "lupus cheilitis" and the "butterfly rash" are well-known, the periodontal manifestations—ranging from chronic gingivitis to aggressive necrotic periodontitis—often lack clear clinical guidelines for management [3, 8].

Recent studies suggest that the integrity of the periodontium in SLE patients is highly dependent on the state of the microcirculatory bed. The underlying "lupus vasculitis" leads to tissue hypoxia and impaired regeneration [11]. Traditional dental treatments often fail to address these rheological issues. Therefore, this study evaluates the efficacy of ozone therapy as a corrective measure for microcirculatory disorders in the oral mucosa of patients with SLE.

Materials and Methods

2.1 Patient Selection and Grouping

A total of 122 patients with inflammatory oral mucosal diseases were analyzed:

-Main Group (n=84): Individuals with confirmed SLE.

-Control Group (n=38): Individuals without systemic pathologies.

2.2 The Scoring-Based Differentiated Approach

To optimize therapy, we implemented a scoring system (2–15 points) based on the severity of mucosal morphological changes.

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-Mild Involvement (2–5 points): Patients received systemic ozone-oxygen inhalations and oral irrigation with ozonated distilled water.
-Moderate Involvement (6–10 points): In addition to basic care, antiseptic treatment of periodontal pockets was performed using the W&H Prozone system (18 seconds per site).
-Severe Involvement (11–15 points): Patients underwent intensive irrigation with 0.06% ozonated sodium hypochlorite (NaOCl).
Synthesis of Active Agents
Ozone was generated on-site using the UOTA-60-01-Medozon clinical ozonator. For the highest severity tier, NaOCl was produced via electrochemical oxidation (EDO-4 unit) and subsequently bubbled with an ozone-oxygen mixture for 10 minutes. This synergistic combination was designed to maximize oxidative potential while maintaining biocompatibility.

Results

Subjective and Objective Clinical Outcomes

Within one week of starting the differentiated protocol, patients in the SLE group reported a substantial decrease in gingival bleeding and a persistent reduction in halitosis. Objective hygiene indices (IGFV, OHI-S) and the Muhlemann bleeding index showed significant positive shifts compared to baseline.

Hemodynamic Analysis via Dopplerography

The pivotal result of the study was obtained through ultrasound Dopplerography of the oral mucosa.
Flow Improvement: Ozone therapy resulted in a 40% increase in blood flow velocity within the microcirculatory bed.

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Waveform Morphology: Post-treatment Doppler curves showed a transition from pathological stasis-related patterns to a healthy wave-like spectrum, indicating improved vascular tone and reduced resistance.

Safety Profile

None of the 84 patients in the main group experienced adverse allergic reactions or complications. The procedures were described as painless, which is crucial for SLE patients who often exhibit increased mucosal sensitivity.

Discussion

The clinical success of this protocol stems from the dual action of ozone: its direct antimicrobial effect and its indirect rheological benefit.

Overcoming Lupus Vasculitis

In SLE, the primary challenge is the localized stasis and hypoxia in the gums. Ozone acts as a "metabolic trigger," enhancing oxygen dissociation and improving the deformability of erythrocytes. This restores the mixed blood flow pattern observed in our Dopplerographic analysis.

Synergetic Effect of Ozonated NaOCl

The use of 0.06% NaOCl mimics the natural bactericidal action of neutrophils. When ozonated, the solution's ability to penetrate the sulfhydryl groups of microbial enzymes is enhanced, allowing for effective debridement of periodontal pockets even in the presence of organic debris, which typically inhibits standard antiseptics.

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Clinical Significance

The ability to achieve a 40% improvement in microcirculation without escalating systemic steroid or antibiotic therapy is a major advantage. It minimizes the pharmacological burden on patients already taking multiple immunosuppressants for their systemic condition.

Conclusions

Differentiated ozone therapy, guided by a specialized scoring system, provides a superior therapeutic outcome for SLE patients with periodontal disease. The local application of ozone-oxygen mixtures and ozonated NaOCl effectively corrects microcirculatory deficiencies, reduces inflammation, and improves the overall quality of life. This method is recommended for integration into standard dental protocols for patients with autoimmune somatic pathologies.

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