Economic Horizons: Journal of Business, Economics, and Finance
ISSN: 2980-5295
Volume 2, Issue 4, April, 2026
Website: ecomindspress.com

IMPROVING THE DIAGNOSIS AND TREATMENT OF PERIODONTAL PATHOLOGY IN PATIENTS WITH SYSTEMIC LUPUS ERYTHEMATOSUS THROUGH 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
Periodontal diseases remain a prevalent challenge in clinical dentistry, particularly when exacerbated by autoimmune systemic conditions such as Systemic Lupus Erythematosus (SLE). This study investigates the efficacy of differentiated ozone therapy in managing inflammatory oral mucosal diseases in SLE patients. A clinical trial involving 122 patients was conducted, comparing standard treatments with an ozone-based protocol. Results, verified by ultrasound Dopplerography and hygiene indices, demonstrated a 40% improvement in microcirculation and a significant reduction in inflammation. The study concludes that ozone therapy is a highly effective, minimally invasive component for treating stomatological manifestations of SLE.

Keywords: Oral mucosa, systemic lupus erythematosus, microcirculatory disorders, ozone therapy, periodontal diseases.

Introduction

Chronic inflammatory periodontal diseases are among the most widespread dental pathologies globally. Despite advances in understanding microbial biofilms and occlusal trauma, treatment efficacy remains suboptimal, often due to underlying somatic conditions. Systemic Lupus Erythematosus (SLE), an autoimmune disease characterized by immune dysregulation and impaired regenerative capacity, significantly impacts the oral mucosa [1, 5, 13].

Economic Horizons: Journal of Business, Economics, and Finance
ISSN: 2980-5295
Volume 2, Issue 4, April, 2026
Website: ecomindspress.com

Clinical Manifestations in SLE

SLE presents with distinct oral markers, including lupus vasculitis (the "butterfly" rash on the face), periorbital petechiae, and necrotic oral ulcers. However, the literature regarding periodontal pathology in SLE is contradictory. Some researchers suggest a long-term preservation of periodontal tissues, while others report rapid necrotic changes and early tooth loss [2, 6, 10].

Pathophysiological Mechanisms

In SLE patients, immune, rheological, and regenerative disturbances manifest early. These systemic factors weaken the local immunity of the oral cavity, making the periodontal tissues susceptible to aggressive inflammation. There is a clear need for a detailed characterization of oral mucosal pathology in SLE and its relationship with general immune homeostasis [7].

Objective

The aim of this study is to improve the diagnosis and treatment of periodontal tissue pathology in patients with SLE by correcting microcirculatory disorders using differentiated ozone therapy and ozonated solutions.

Materials and Methods

Study Population

The study included 122 patients with inflammatory oral mucosal diseases treated at the Samarkand Regional and City Dental Polyclinics and the "Sam Denta Medic" clinic.

-Main Group (n=84): Patients with concomitant Systemic Lupus Erythematosus (SLE).

-Comparison Group (n=38): Patients without somatic pathology.

2.2 Differentiated Treatment Protocol

A scoring system (2 to 15 points) was developed to tailor the treatment based on the severity of the inflammatory process and the patient's individual morphological changes.

Economic Horizons: Journal of Business, Economics, and Finance
ISSN: 2980-5295
Volume 2, Issue 4, April, 2026
Website: ecomindspress.com

Tier 1: Low Severity (2–5 points)
Twenty-two patients (26.2%) received:
-Inhalations with an ozone-oxygen mixture.
-Irrigation of oral cavities, carious lesions, and root canals with ozonated distilled water and antiseptics.
-Professional dental cleaning combined with ozone application.
Tier 2: Moderate Severity (6–10 points)
Forty-one patients (48.8%) received:
-Antiseptic treatment of periodontal pockets using the W&H Prozone device.
-Specialized disposable Perio nozzles were used for 18 seconds per site.
Tier 3: High Severity (11–15 points)
Twenty-one patients (25.0%) received the Tier 2 protocol plus:
-Treatment with a 0.06% ozonated sodium hypochlorite (NaOCl) solution.
Preparation of Ozonated Solutions
Because ozone is unstable and decomposes into oxygen within minutes at room temperature, it was synthesized on-site:
-Ozone-Oxygen Synthesis: Generated via the "UOTA-60-01-Medozon" clinical ozonator.
-Bubbling Method: The gas mixture was bubbled through antiseptic or NaOCl solutions for 10 minutes.
-Storage: Ozonated NaOCl was stored at 6–8°C to maintain stability.
-Electrochemical Generation: NaOCl was produced via the EDO-4 electrochemical unit by oxidizing isotonic sodium chloride.

Results

Safety and Patient Comfort

No complications were observed in the main group. Patients reported high levels of comfort and the procedures were noted as being painless and atraumatic. Subjective improvements, such as reduced gingival bleeding and a "long-lasting feeling of freshness," were reported within seven days.

Clinical Indices

Intra-group analysis showed statistically significant positive dynamics in both groups for the following indices:

Economic Horizons: Journal of Business, Economics, and Finance
ISSN: 2980-5295
Volume 2, Issue 4, April, 2026
Website: ecomindspress.com

IGFV & OHI-S: Significant improvement in hygiene levels.
Muhlemann Index: Marked reduction in gingival bleeding.
Microcirculatory Improvements
The most critical finding was obtained via ultrasound Dopplerography.
Quantitative Change: Ozone therapy led to a 40% improvement in blood circulation within the microcirculatory bed.
Qualitative Analysis: Doppler curves in treated patients shifted toward a healthy mixed blood flow spectrum, characterized by a wave-like pattern without the sharp, pathological peaks associated with stasis or acute inflammation.

Discussion

The results confirm that the integration of ozone therapy creates a superior environment for periodontal healing compared to standard antiseptic protocols.
Mechanism of Action of Ozonated NaOCl
Sodium hypochlorite acts as a potent oxidant, mimicking the oxidative burst of polymorphonuclear neutrophils. Its bactericidal effect stems from the release of hypochlorous acid and gaseous chlorine. However, its effectiveness is often hindered by organic matter. By ozonating the NaOCl and applying it repeatedly, we neutralized the sulfhydryl groups in microbial enzymes more effectively, overcoming the "organic barrier."
Impact on Microcirculation
The 40% improvement in microcirculation is pivotal for SLE patients. SLE-induced vasculitis and rheological disturbances typically lead to tissue hypoxia. Ozone therapy reverses this by:
-Enhancing oxygen metabolism in the tissues.
-Reducing blood viscosity and improving erythrocyte flexibility.
-Acting as a direct anti-inflammatory agent.
Reduction of Pharmacological Load
One of the most significant clinical advantages observed was the reduced need for systemic medications. By effectively controlling local inflammation and infection through ozone, the reliance on antibiotics and steroid-based local applications—which often have undesirable side effects in autoimmune patients—was significantly decreased.

Economic Horizons: Journal of Business, Economics, and Finance
ISSN: 2980-5295
Volume 2, Issue 4, April, 2026
Website: ecomindspress.com

Conclusions

The clinical and functional data from this study confirm the high anti-inflammatory and regenerative potential of ozonated liquids in the treatment of SLE patients.

-Diagnostic Value: The developed scoring program provides a reliable framework for personalizing dental care in somatic patients.

-Therapeutic Value: The Prozone-generated ozone-oxygen mixture and ozonated NaOCl are highly effective at restoring the microcirculatory bed.

-Recommendation: Ozone therapy should be recommended as a standard anti-inflammatory component in the comprehensive dental management of patients with Systemic Lupus Erythematosus.

References

1. Abdullayev X., Ismatova K. Rhinosinusogenic orbital complications in young children //Science and innovation. – 2024. – T. 3. – №. D7. – C. 103-106.
2. Badarch M., Iriskulova E., Tudevdagva U. Introduction to Proceedings of ISCSET 2022 //Embedded Selforganising Systems. – 2022. – T. 9. – №. 3. – C. 2-3.
3. Ergashev J. D., Sigatullina M. I., Ibragimov U. K. Neuropsychic growth of children with hypoxi–ischemic encephalopathy //The 2th World Congress of Neonatology.–6th–9th January. – 2010. – C. 19.
4. Ergashev J. et al. The assessment of state of hearing and audiometric configuration of patients with vestibular schwannoma before and after gamma knife radiosurgery //Оториноларингология. Восточная Европа. – 2017. – T. 7. – №. 1. – C. 31-38.
5. Ergashev J. et al. Epidemiological and evolutionary study of vestibular schwannomas after different types of treatment : дис. – Universidade de Santiago de Compostela, 2014.
6. Ergashev J. et al. Clinical picture of vestibular schwannomas in a series of 106 patients managed with different treatment methods //Новый день в медицине. – 2019. – №. 4. – C. 369-373.

Economic Horizons: Journal of Business, Economics, and Finance
ISSN: 2980-5295
Volume 2, Issue 4, April, 2026
Website: ecomindspress.com

7. Ergashev J. D. et al. MANAGEMENT OF VESTIBULAR SCHWANNOMAS: AGE MATTERS //SCIENCE. – 2024. – Т. 3. – №. 10-4. – С. 221-225.
8. Ergashev J. D. et al. Gamma Knife Radiosurgery for Vestibular Schwannomas: Favorable and Unfavorable Effects in Series of 42 Patients. – 2019.
9. Ganiev A. A. et al. The practice of oropharynx cancer: A case report and literature review //Annals of Cancer Research and Therapy. – 2019. – Т. 27. – №. 2. – С. 37-41.
10. Iriskulova E. et al. Intraparotid facial nerve schwannoma: a cross-country report of two cases and literature review //Annals of Cancer Research and Therapy. – 2020. – Т. 28. – №. 2. – С. 93-96.
11. Iriskulova E., Kodirova Z., Juraboev S. Prognosis of Complications at Surgical Treatment of Benign Parotid Tumors //Embedded Selforganising Systems. – 2022. – Т. 9. – №. 3. – С. 70-72.
12. Iriskulova E. et al. Intraparotid facial nerve schwannoma: a cross-country report of two cases and literature review //Annals of Cancer Research and Therapy. – 2020. – Т. 28. – №. 2. – С. 93-96.
13. Iriskulova E., Nurxojaeva A. Express assessment of sonoelastographic parameters in patients with tumors of the parotid salivary gland //Embedded Selforganising Systems. – 2022. – Т. 9. – №. 3. – С. 18-19.
14. Ismatova K. A. et al. The new coronavirus infection in otolaryngological practice: clinical features in different age groups //Science and innovation. – 2023. – Т. 2. – №. Special Issue 8. – С. 813-816.
15. Khamraeva V. S., Karabaev H. E., Ergashev J. D. The choice of optimal medical method for exudative otitis media in children //CHOICE. – 2018. – Т. 4. – С. 24-2018.
16. Shovkatovich S. O., Muratovna N. M. OPTIMIZATION OF COMPLEX THERAPY FOR CHRONIC RECURRENT APHTHOUS STOMATITIS //World Scientific Research Journal. – 2025. – Т. 45. – №. 1. – С. 119-123.
17. Shovkatov O.Sh., Sharipov S.S., Akhundjanov R.A. / 2025. MODERN PROSTHODONTIC TECHNOLOGIES IN COMPLETE EDENTULISM:

Economic Horizons: Journal of Business, Economics, and Finance
ISSN: 2980-5295
Volume 2, Issue 4, April, 2026
Website: ecomindspress.com

APPLICATION OF CAD/CAM AND 3D PRINTING. *Журнал гуманитарных и естественных наук*. 2, 28 [2] (дек. 2025), 6–13.

18. Shovkatov O.Sh., Sharipov S.S., Akhundjanov R.A. 2025. BIOMATERIALS AND THEIR BIOLOGICAL COMPATIBILITY: A CLINICAL ANALYSIS OF PMMA, THERMOPLASTICS, BIOACTIVE POLYMERS, NANOMATERIALS, AND NEXT-GENERATION ZIRCONIA. *Журнал гуманитарных и естественных наук*. 2, 28 [2] (дек. 2025), 19–25.
19. Shovkatov O.Sh., Mirsaidov M.M. (2026). KATTA CHAYNOV TISHLARI EKSTRAKSIYASIDAN KEYINGI YALLIG‘LANISHLARNING OLDINI OLISHDA ANTIBIOTIKLAR SAMARADORLIGINI BAHOLASH. *ОСНОВЫ МЕДИЦИНЫ*, *1*(8), 147–150. извлечено от https://journals.tnmu.uz/tas/article/view/3760
20. Yun J. M. et al. Optimizing Cochlear Implant Position for Magnetic Resonance Imaging of Vestibular Schwannoma //Laryngoscope Investigative Otolaryngology. – 2025. – Т. 10. – №. 6. – С. e70319.