

FEATURES OF PERIODONTITIS TREATMENT USING HYALURONIC ACID AND PHOTODYNAMIC THERAPY

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Abstract: Periodontitis is one of the most common inflammatory diseases of the oral cavity, accompanied by the destruction of supporting tissues of the teeth. Modern treatment methods are aimed not only at eliminating inflammation but also at restoring periodontal structure. This study investigated the effectiveness of the combined use of hyaluronic acid and photodynamic therapy in the treatment of moderate chronic generalized periodontitis. A clinical observation of 60 patients was conducted, divided into a control and study group. The study group received a combination of standard treatment with hyaluronic acid applications and photodynamic laser therapy ($\lambda = 660$ nm). The results showed a significant improvement in clinical and microbiological parameters in patients in the study group. The combined method demonstrated anti-inflammatory, regenerative, and antimicrobial effects, ensuring long-term disease remission.

Keywords: periodontitis, hyaluronic acid, photodynamic therapy, treatment, laser.

INTRODUCTION

Periodontitis is a chronic inflammatory disease of the tissues surrounding the teeth, leading to the destruction of connective tissue structures and bone resorption in the alveolar process. Traditional treatment methods include mechanical treatment, antiseptics, and anti-inflammatory drugs; however, their effectiveness is limited in chronic forms of the disease. Hyaluronic acid (HA) is a biocompatible polysaccharide that promotes tissue regeneration, moisture retention, and stimulation of angiogenesis. Photodynamic therapy (PDT), based on the use of photosensitizers and laser radiation, destroys pathogenic microflora without damaging healthy tissue. The combination of these methods opens up new possibilities for the comprehensive treatment of periodontitis.

STUDY OBJECTIVE

To evaluate the clinical efficacy of hyaluronic acid in combination with photodynamic therapy in the treatment of chronic generalized periodontitis. **MATERIALS AND METHODS**

The study involved 60 patients aged 25 to 55 years diagnosed with moderate chronic generalized periodontitis. Patients were divided into two groups: a control group (30 patients), which received standard treatment (hygiene, scaling, curettage, and antiseptic applications), and a study group (30 patients), which additionally received photodynamic therapy using a 0.2% chlorin e6 solution and hyaluronic acid (1.5 MDa). PDT was performed using a diode laser with a wavelength of 660 nm, a power of 100 mW, and an exposure of 60 seconds per area. Efficacy was assessed using the GI, PI, CAL indices, and microbiological parameters before and after 4 weeks of treatment. **RESULTS**

After 4 weeks of treatment, patients in the main group demonstrated a significant reduction in

inflammatory indices: GI decreased by 48%, PI by 42%, and periodontal pocket depth decreased from 4.8 ± 0.3 mm to 3.0 ± 0.2 mm. Microbiological testing revealed a more than threefold reduction in the counts of *P. gingivalis* and *T. forsythia*. Accelerated epithelialization and improved gingival structure were observed in 86% of patients in the main group versus 53% in the control group. No side effects or complications were observed with hyaluronic acid or PDT.

DISCUSSION

The obtained results confirm that the combination of hyaluronic acid and photodynamic therapy provides a significant therapeutic effect in the treatment of periodontitis. PDT promotes the elimination of pathogenic microflora and disinfection of periodontal pockets, while hyaluronic acid accelerates tissue regeneration and stabilizes gingival attachment. The synergistic nature of these methods allows for more pronounced and lasting clinical results compared to traditional therapy.

CONCLUSION

The combined use of hyaluronic acid and photodynamic therapy in the treatment of chronic periodontitis provides effective anti-inflammatory, antibacterial, and regenerative effects. This technique accelerates epithelialization, improves microcirculation, and restores periodontal tissue. The proposed approach can be recommended for widespread use in modern clinical practice.

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