



CLINICAL AND LABORATORY CHARACTERISTICS OF TROPHIC ULCER OF THE ORAL CAVITY

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Abstract

Modern diagnostics of trophic ulcers of the oral mucosa is based on a comprehensive approach, including clinical examination, laboratory methods, instrumental and morphological studies. Treatment of trophic ulcers of the oral mucosa is a complex clinical task and requires a comprehensive, pathogenetically substantiated approach. It includes the elimination of etiological factors, systemic therapy of the underlying disease, local treatment of the ulcer defect, as well as the use of regenerative and immunomodulatory agents. This article describes the results of studies conducted after the treatment of trophic ulcers of the oral mucosa using Novacell Ziyo biofilm (Uzbekistan)

Keywords: Trophic ulcer, oral mucosa, treatment, biofilm.

Introduction

The leading cause of the development of long-term non-healing wounds is chronic venous insufficiency. At the same time, the pathogenetic mechanisms of the development of trophic disorders in chronic venous insufficiency are common and do not depend on the causes of its occurrence. The pathogenesis is based on



disturbances of macro- and microhemodynamics; even in a horizontal position, the capacity of the venous system increases due to an increase in the initial extensibility of the walls of venous vessels [1]. Clinically, trophic ulcers are characterized by a long course, pain syndrome, recurrent nature, resistance to standard therapy and a tendency to chronicity. In some cases, secondary infection, formation of fibrinous plaque, perifocal inflammation and, in the absence of adequate treatment, the development of complications, up to malignancy of the ulcer defect, are possible [3-5]. Often, the treatment of trophic ulcers is difficult to conservative therapy, which led to the need for surgical excision with subsequent therapy, frequent relapse. Systemic treatment is aimed at correcting metabolic disorders (including diabetes), improving the immune response, eliminating hypovitaminosis and using drugs that stimulate angiogenesis. Antioxidants, immunomodulators, probiotics and drugs based on polypeptides and nucleic acids are also used [6].

A promising direction is the use of laser therapy, ozone therapy, photodynamic therapy and tissue engineering technology using stem cells and biomaterials that imitate the extracellular matrix [7].

This dissertation study was conducted at the Tashkent State Dental Institute, in the Department of Therapeutic Dentistry in 2022-2025.

The study involved 75 people, including 55 patients with trophic ulcers of the oral mucosa and 20 healthy individuals without lesions of the oral mucosa. The study included people aged 65-75 years, including 28 men and 27 women. The average age of the subjects was 69.4 ± 0.9 years. The study participants (55) were divided according to the following criteria:

Group 1 (main) - patients who received complex treatment for trophic ulcer of the oral mucosa with the inclusion of Novacel Ziyo biofilm (Uzbekistan) and subsequent laser irradiation (28 patients),

Group 2 (comparison) - patients who received traditional complex treatment for trophic ulcer of the oral mucosa (27 patients),

Group 3 (control) - healthy individuals with sanitized oral cavity who are not sick (20 people).

Domestic scientists have developed a concept of the optimal composition and properties of the Novacel Ziyu biofilm based on sodium carboxymethylcellulose with methylene blue (Niyazova Z.A., Sarimsakov A.A., Khegay L.N., 2019). The film is characterized by biocompatibility, biodegradability, permeability to water vapor, elasticity, strength, the presence of antimicrobial properties, the absence of cytotoxicity, pyrogenic and toxic effects. The laser radiation was applied with a wavelength of 650 nm and an output power of at least 1.5 mW, while the laser beam modulation frequency was determined by the number of procedures performed and varied from 1 Hz in the middle of the course of treatment to 10 Hz by the end of the course. During examination of the oral cavity after the treatment, the time of epithelialization of the trophic ulcer was noted. In this case, in the main group, a reduction in the time was noted by 1.3 times faster than in the comparison group. (Table 1).

Table 1 Time of ulcer epithelialization in the subjects

Patient group	Number of patients (n)	Minimum period of epithelialization, days	Maximum period of epithelialization, days	Average period of epithelialization, days ($M \pm m$)
Main group	28	5	10	$6,8 \pm 0,3$
Comparison group	27	8	16	$11,2 \pm 0,4$



Fig. 1. Clinical examination of the patient before and after treatment

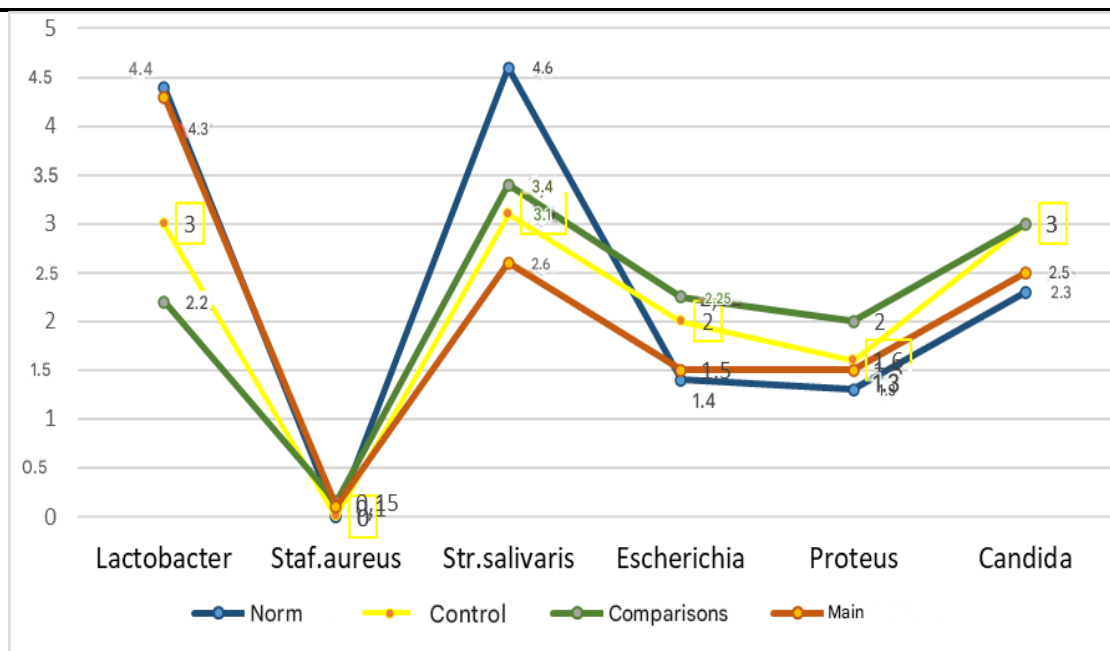


Fig. 4.3 State of the oral microflora in patients with trophic ulcers after treatment

After the treatment, the balance of the biocenosis in the subjects was restored. In the main group, the reduction in microbial strains was 1.5 times greater than in the comparison group.

Analysis of local immunity indicators after treatment of trophic ulcers of the oral mucosa revealed reliable differences between the main group and the comparison group (Table 2).

In patients of the main group who received combination therapy using biofilms and low-intensity laser irradiation, a statistically significant increase in the level of secretory immunoglobulin A (sIgA) was observed compared to the comparison group (0.49 ± 0.02 g / l versus 0.36 ± 0.03 g / l, $p < 0.01$), which indicates a more active restoration of local protective mechanisms of the mucous membrane. The sIgA/IgG ratio in the main group was also significantly higher (2.33 ± 0.15 vs. 1.50 ± 0.12 , $p < 0.01$), reflecting a more balanced and targeted immune response under conditions of combination therapy. The IgG level did not differ significantly between the groups, indicating a selective effect of therapy mainly on the components of mucosal immunity. In addition, the main group showed a



significant decrease in the level of the proinflammatory cytokine IL-1 β (13.2 ± 1.1 pg/ml vs. 20.5 ± 1.3 pg/ml in the comparison group, $p < 0.001$), as well as a significant increase in the concentration of the anti-inflammatory cytokine IL-10 (9.8 ± 0.7 pg/ml vs. 6.1 ± 0.6 pg/ml, $p < 0.01$). These data indicate a pronounced anti-inflammatory and immunomodulatory effect of the combination therapy.

Table 2. Local immunity indicators after treatment of trophic ulcers of the oral mucosa

Index	Control group	Before treatment	After treatment main group	After treatment Comparison group
sIgA, mg/l	$183,2 \pm 7,5$	$97,4 \pm 6,3$	$165,1 \pm 7,1$	$152,3 \pm 7,0$
Lysozyme, μ g/ml	$13,8 \pm 1,2$	$7,1 \pm 0,9$	$12,4 \pm 1,0$	$11,8 \pm 1,0$
Phagocytic activity, %	$71,5 \pm 3,2$	$48,9 \pm 3,6$	$67,3 \pm 2,9$	$58,7 \pm 3,0$
IL-1 β , pg/ml	$18,7 \pm 1,6$	$42,5 \pm 2,3$	$22,3 \pm 1,9$	$25,1 \pm 2,0$
TNF- α , pg/ml	$12,3 \pm 1,1$	$36,2 \pm 2,0$	$15,7 \pm 1,3$	$15,5 \pm 1,3$
IgG, mg/l	$101,5 \pm 4,8$	$138,7 \pm 6,2$	$110,4 \pm 5,1$	$112,5 \pm 5,1$
IgM, mg/l	$62,2 \pm 3,7$	$85,3 \pm 4,1$	$67,5 \pm 3,9$	$69,4 \pm 3,9$
Lactoferrin, μ g/ml	$9,5 \pm 0,8$	$5,6 \pm 0,6$	$8,8 \pm 0,7$	$8,8 \pm 0,7$
Defensins (total), ng/ml	$55,7 \pm 3,5$	$29,3 \pm 2,7$	$50,4 \pm 3,1$	$50,4 \pm 3,1$

Thus, the use of biofilms in combination with laser irradiation promotes activation of the local immune response, reduction of inflammation and acceleration of reparative processes, which is confirmed by immunological parameters.

Conclusions. When using combination therapy: a decrease in microbial contamination of the wound surface and normalization of the oral microbiocenosis were revealed, which contributes to a more favorable course of reparative processes.

In patients of the main group who received combination therapy using biofilms and low-intensity laser irradiation, a statistically significant increase in the level of secretory immunoglobulin A (sIgA) was observed compared to the group, which indicates a more active restoration of local protective mechanisms of the mucous membrane (165.1 ± 7.1), normalization of the IgA / IgG ratio, a decrease in the content of proinflammatory cytokines in the affected area.



Thus, the combined use of biofilms and laser therapy contributes to a reliable reduction in the time of epithelialization of ulcerative defects and a reduction in inflammation compared to traditional treatment methods.

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