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FEATURES OF LOCAL TREATMENT OF PURULENT-NECROTIC SOFT TISSUE WOUNDS IN DIABETES MELLITUS

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ABSTRACT

Wound infection occupies one of the leading places in the general structure of surgical morbidity and is observed in 35-45% of surgical patients. Soft tissue defects of various etiologies are diagnosed in almost 2.5 million patients worldwide, about 20% of them are people suffering from diabetes mellitus. The article presents the results of complex local treatment of purulent-necrotic wounds in patients with diabetes mellitus using acerbin solution.

KEYWORDS: *Diabetes Mellitus, Purulent-Necrotic Wound, Necrectomy, Acerbin Solution, Ph.*

INTRODUCTION

Modern complex treatment of surgical infections is impossible without the use of full-fledged intensive therapy, methods of physical impact on wounds, pathogenetically justified dressings, the change of which is subject to increased requirements [1, 2].

The wound process against the background of diabetes mellitus (DM) has certain features that are characterized by pronounced microcirculatory disorders, the presence of microthrombs, the

formation of a sludge phenomenon, dystrophic and necrotic processes, the predominance of the inflammatory component over the reparative, inhibition of cell proliferation, inhibition of phagocytic activity of leukocytes, incomplete phagocytosis, a high degree of microbial contamination of wound tissues, a decrease in the overall and local immunological reactivity [3, 4, 5].

Natural external factors that play a decisive role in wound healing are humidity and the value of the hydrogen index (pH) of the medium, which determine the rate of all biochemical reactions occurring in the wound [6, 7]. Since pH is a key factor in the healing process, its level must be taken into account when local exposure to wounds.

There are known medications of local action - this is the drug "Acerbin". "Acerbin" is a solution for external use, which includes malic, benzoic and salicylic acids [8, 9]. The drug has antiseptic, analgesic and wound healing properties, reduces the formation of exudate and promotes the formation of scab, granulation and epithelization. Malic acid improves metabolic processes and fluid balance in the wound area. Benzoic acid has an antibacterial effect. Due to its pH, "Acerbin" prevents the alkalization of the wound, which prevents infection and stimulates healing [10, 11]. "Acerbin" is successfully used for the treatment of burns, varicose ulcers, suppurative processes and trophic ulcers.

The purpose of the research: To study the effectiveness of complex local treatment of purulent-necrotic soft tissue wounds in diabetes mellitus.

Materials and methods of the research: The study was conducted on the basis of the department of purulent surgery of the Samarkand City Medical Association. 102 patients were examined, including 62 men and 40 women for the period 2019-2021. The average age of the patients was 59.4±4 years. The control group included 50 patients who underwent traditional local treatment - wet-drying gauze bandages with standard antiseptics were used. The main group consisted of 52 patients whose local treatment consisted in purposeful correction of the pH of the wound surface at all stages of the wound process: gauze bandages with acerbin solution were applied to postoperative wounds.

The study groups and the comparison group were comparable by gender, age, severity of diabetes mellitus, the presence of concomitant diseases, types of surgical and conservative treatment.

Of the concomitant pathology, ischemic heart disease and arterial hypertension were most common.

Upon admission to the hospital in patients with purulent soft tissue lesions, along with a general clinical examination, the appearance, the presence of skin hyperemia and infiltration of the wound edges, the nature of granulation, the severity of epithelialization were evaluated. During the observation, pH was measured using portable pH meters – electronic testers with a glass electrode. pH measurement was performed immediately after application of the solution and every 4 hours for 36 hours.

In all patients, after opening the abscess, secondary surgical treatment of wounds was performed, consisting in opening the purulent cavity with necrectomy and drainage. Subsequently, infusion, antibacterial, anti-inflammatory therapy was carried out, in patients with diabetes, correction of

blood sugar levels was achieved with the help of insulin therapy.

Results and discussion:

Analysis of the results of studying the pH values of the wound zone in all patients at different stages of the wound process showed that immediately after surgery, there is a weak acid reaction in the wound, which during the first phase of the wound process becomes slightly alkaline. As the wound is cleaned and signs of healing appear, the pH changes to the acidic side, approaching the values of intact skin at the end of the third phase.

The results of studies in the control group showed that wounds in patients were cleaned of purulent-necrotic masses for a long time, granulation tissue appeared only on days 9-21. Reduction of perifocal edema and hyperemia occurred on days 6-18, filling of wounds with mature granulation tissue occurred on days 12-30, epithelialization began on days 15-33. Only 61.54% of patients in this group had complete epithelization of wounds by the end of the follow-up period.

Immediately after surgical treatment, the wound pH of patients in this group was 6.2 ± 0.11, subsequently it shifted to the alkaline side, and was maximum (9.2) in the exudation phase. During the epithelialization phase, its values were in the range of 8.0 ± 0.14.

Thus, when studying the pH in patients of the control group, a more pronounced latching of the wound was revealed, which persists at all stages of the wound process. Even in the case of complete epithelization, the pH of the scar surface remained slightly alkaline.

To purposefully change the pH during local treatment in the main group, we used an acerbin solution having a pH of 2.3. An important advantage of it compared to other studied means for local treatment of wounds is stability in the external environment, absence of cytotoxicity and the ability to maintain pH with significant dilution. The task of the next fragment of the study was to purposefully correct the pH of wounds in these patients at different stages of the wound process. To do this, wet-drying bandages soaked in acerbin solution were used for the patients of the main group after surgery and throughout the entire treatment period.

When using wet-drying gauze wipes in the first phase of the wound process, after 3-4 hours, the wipes were soaked with purulent exudate, then dried, this required repeated dressings, during which it turned out that the pH of the wound surface increased to the initial one, which required repeated dressings to maintain the set pH value (on average up to 4 dressings per day).In the II and III phases of the wound process, the napkins were soaked less, but also dried out, which also required additional wetting with acerbin. Due to the increased adhesion of the gauze napkin to the wound surface, its removal led to traumatic damage to the granulations. In addition, the use of wet-drying bandages excessively dried the wound, which did not allow creating a moist environment for a long time.

The results of the experiments showed that as the gauze bandage dried (3-4 hours), the pH on its surface also changed, becoming neutral by the time the bandage completely dried.

During the clinical assessment of the course of the wound process in patients of the main group, it was noted that the relief of perifocal edema occurred on 3-9 days, the appearance of single granulations - on 6-9 days, the filling of wounds with mature granulation tissue-on 9-15 days, the onset of epithelialization on 12-18 days. The pH of the wounds in this group of patients in the

exudation phase was 7.1 ± 0.1. Subsequently, in phase 3, it decreased to optimal values (5.6 ± 0.12).

The proposed method of application of acerbin solution made it possible to carry out membrane dialysis of wounds, with a given pH value. The absorbent base of the bandage provided effective evacuation of wound exudate, which prevented excessive hydration of the wound. At the same time, the necessary moist environment was preserved on the surface of the wound. Thus, optimal conditions were created for a favorable course of the wound process.

CONCLUSIONS

Thus, targeted correction of the pH of wounds using acerbin solution allows to have a positive effect on the wound process in patients with diabetes mellitus by maintaining at a constant level the microclimate optimal for healing in the wound.

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