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Combined Local Treatment of Long-term Non-healing Wounds

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BACKGROUND

The long period of wound healing contributes to the accumulation of the number of such patients, which reached more than 40 million people around the world 10 years ago. This pattern of spread of long-term non-healing wounds was noted by P. Driscoll as a "silent epidemic". However, after 5 years, there were reports that the number of patients with long-term non-healing wounds reached 500 million. Our study aimed to improve the results of the treatment of patients by developing and applying therapeutic and diagnostic algorithms depending on the prognostic probability of the development of generalisation of infection.

MATERIAL AND METHODS

The results of the application of the therapeutic and diagnostic algorithm developed by us in patients with long-term non-healing wounds are analysed. A total of 169 patients took part in the study. All of them were divided into a control group of 84 patients who used traditional methods of treatment and the main group of 85 patients who used the algorithm developed by us.

RESULTS

In the absence of a prognostic probability of generalisation of infection, the method of choice for local wound treatment was the use of dressings with controlled negative pressure (vacuum therapy). To carry out sessions of controlled

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negative pressure on the wound, we used polyurethane foam dressings with micropores of 400-600 microns. This made it possible to ensure an even distribution of controlled negative pressure over the entire wound surface. Each session of controlled negative pressure application was carried out in the vacuum mode of 0.1-0.15 atm. (76-115 mm Hg) for 9-10 minutes. Among the side effects of using such a regimen of controlled negative pressure on the wound, there was a feeling of moderate pain in the wound area, which did not require the use of any analgesic drugs. This technique in patients with no prognostic probability of generalisation of infection in a long-term non-healing wound was performed for an average of 5.5 ± 0.5 days, which made it possible to subsequently use surgical methods of wound closure. Such a regime and duration of sessions of exposure to a long-term non-healing wound of controlled negative pressure made it possible to control the moisture and the amount of exudate in the wound. If the patients had an insignificant prognostic probability of generalisation of infection, the regimen of sessions using controlled negative pressure on the wound was extended to an average of 8.4 ± 0.8 days with the duration of each session up to 13-15 minutes. This made it possible to minimise the moist environment of the wound and, accordingly, the amount of exudation, thereby reducing the likelihood of its entry into the systemic circulation. However, in the case of patients with a long-term non-healing wound with a pronounced prognostic probability of the development of generalisation of infection, ses-

sions with the application of controlled negative pressure to the wound were insufficient. Despite the prolongation of vacuum therapy sessions to an average of 13.6 ± 2.1 days, such patients were also treated with laser photodynamic therapy according to the method of B.Z. Khamdamov after each session of vacuum therapy. For this purpose, after the completion of the next session of vacuum therapy, a photosensitiser was applied – a 0.05% solution of methylene blue, belonging to the group of phenothiazines, with a maximum absorption λ_{\max} (nm) of 668 nm with an exposure of 5 minutes. Then, after washing off the photosensitiser from the wound surface, the wound surface was illuminated with laser radiation using the ALT-Vostok model 03 device, which meets the technical specifications TSh 64-15302652-002:2010. The general prophylactic effect on the possible probability of generalisation of infection in patients with long-term non-healing wounds was carried out by the use of Neupogen® and Infliximab according to the scheme developed by us.

CONCLUSION

Prevention of generalisation of infection in patients with long-term non-healing wounds, which includes a differentiated approach of local (vacuum therapy and laser photodynamic therapy), as well as general impact on the course of both wound and inflammatory processes, involves the use of pathogenetically substantiated methods for correcting disorders of local and general immunity.