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Optimisation of Treatment Methods for Necrotic Forms of Erysipelas of Soft Tissues

D.N. Korikhonov[1]

ABSTRACT

This study aimed *to improve the results of treatment of patients with complicated forms of erysipelas by solving several specific tasks: to study the state of immunological status in patients with complex forms of erysipelas; to study the efficacy of systemic enzyme therapy in the treatment of patients with complicated forms of erysipelas; to study the effectiveness of oxytocin in combination with therapeutic measures in patients with complex forms of erysipelas; to develop and introduce into clinical practice a surgical method of treatment using plasma technologies, early necrectomy with single-stage autodermoplasty in the complex treatment of complicated forms of erysipelas; to study the effectiveness of the clinical trial. Based on the studies carried out, we were the first in clinical practice to treat complicated forms of erysipelas by using a method that combines plasma technologies and early necrectomy with single-stage autodermoplasty. For the first time in the treatment of complex forms of erysipelas, oxytocin was used in combination with surgical treatment, the action of which is aimed at eliminating the infectious agent from the intracellular depot, and its effectiveness was proven. In combination with the measures taken, an antibacterial therapy regimen has been developed aimed at eliminating microorganisms from the area of the pathological process. As an additional treatment, in contrast to the previously proposed treatment regimens, a drug of systemic enzyme therapy - phlogenzyme - was used.*

Keywords: *erysipelas, soft tissue necrosis, enzyme therapy*

INTRODUCTION

At the present stage, there is a change in typical, classical clinical symptoms and the course of surgical infection [1, 2, 3, 4].

This trend is also observed in complicated forms of erysipelas, which leads to a longer duration of treatment [5, 6, 7, 8].

Complicated forms of erysipelas with extensive lesions lead to persistent disability in 17-28% of patients

[1] ***Corresponding Author:*** Assistant, Department of General and Pediatric Surgery-1, Tashkent Medical Academy, Tashkent, Uzbekistan, e-mail: dqorixonov@gmail.com

and lead to a long-term hospital stay (1 month or more) in up to 35-47% of patients [9, 10, 11].

Mortality in the necrotic form of erysipelas varies from 6 to 36%. The number of erysipelas recurrences, according to several authors, is also increasing and is about 50% [12, 13, 14].

There is also an established idea that the only causative agent of Erysipelas is considered to be β-hemolytic streptococcus, but at the moment, there is a replacement of the streptococcus monoculture from the focus of inflammation with a microbial association, which leads to the development of purulent complications, generalisation of surgical infection, or chronicity of its course [15, 16, 17, 18, 19].

Today, there is a whole arsenal of drug therapy: antibiotics, anticoagulants, vitamins, enzymes, and many methods of surgical treatment of complicated forms of erysipelas: necrectomy, the use of extracorporeal techniques, indirect lymphotropic therapy, etc. [20, 21, 22, 23, 24, 25].

Despite the availability of many methods of treatment, the incidence of erysipelas, especially complicated forms, remains at high numbers, and the number of relapses continues to increase, which dictates a further search for new methods of treatment for this nosology.

MATERIAL AND METHODS

This study is based on clinical material, including the experience of treating 120 patients with complicated erysipelas in the multidisciplinary clinic of the Tashkent Medical Academy for the period from 2013 to 2023. The groups were formed by the method of typological selection according to the main feature (complicated forms of erysipelas).

The observation was continuous in terms of coverage, current in time and immediate in appearance. The population consisted of 120 patients, including 70 (58.3%) women and 50 (41.7%) men. Of these, the study group included 63 (52.5%) patients with destructive erysipelas, including 36 (57.1%) women and 27 (42.9%) men aged 21 to 84 years. The mean age of patients was 56.4±12.23 years. The comparison group consisted of 57 (47.5%) patients with destructive erysipelas aged 17 to 76 years. Among them were 34 (59.6%) women and 23 (40.4%) men. The mean age of the patients was 55.2±11.54 years. The analysis showed that the studied groups of patients were comparable in gender and age.

The largest proportion of the studied were patients with phlegmonous erysipelas - 74 people (61.7%), followed by patients with bullous-hemorrhagic form - 33 (27.5%), necrotic form - 13 (10.8%). There were no statistically significant differences in the forms of the disease in the compared groups.

Additional examinations revealed concomitant pathology in 63.5% of patients. In 24 (20.0%) patients, varicose veins of the lower extremities were noted. In 5 (4.2%) cases, trophic ulcers were present. Diabetes mellitus was observed in 16 (13.3%) patients. 23 (19.2%) patients had coronary heart disease with stage 2A - 2B heart failure. In 14 (11.6%) cases of erysipelas, lymphedema was detected, which, in addition to the lower extremities, was observed in 2 patients on the upper extremities as a result of surgical treatment for breast cancer. In 30 (25.0%) cases, mycosis of the feet was detected. In 8 (6.7%) cases, non-specific lung and kidney diseases were diagnosed.

Newly diagnosed erysipelas were registered in 64 (53.3%) patients, in the remaining 56 (46.7%) patients, a relapse of this disease was revealed. There are no statistically significant differences in the compared groups along the course of erysipelas.

Most patients went to the hospital later than 4-5 days from the onset of the disease. According to the localisation of erysipelas, in 97 (80.8%) patients, these are the lower extremities, in 23 (19.2%) - other localisations.

All incoming patients in the study groups were examined according to the scheme established in the clinic. To determine the severity of patients during hospitalisation and treatment, we used the following data: the patient's complaints, anamnestic data, physical examination, including measurement of the area of lesions of the skin, determination of the depth of soft tissue lesions, assessment of the local status, as well as the presence of concomitant pathology.

Of the additional research methods, laboratory studies of the general blood count, general urinalysis, and biochemical blood test were carried out, and a coagulogram was examined. We also determined the leukocyte index of intoxication according to the method proposed by Kalf-Kalif.

Hemograms using numerical values of the leukocyte index of intoxication were converted into numerical indicators reflecting the level of intoxication of the body. The values of the leukocyte index of intoxication of 2.1 - 7.0 conventional units indicated a compensated insufficiency of the immune system.

With decompensation of the immune system, the leukocyte index of intoxication ranged from 7.1 to 12 conventional units. The nuclear index of intoxication was used to determine the severity of patients and endotoxi-

cosis. The values of the nuclear intoxication index from 0.08 to 0.3 indicated a relatively satisfactory condition of the patient, with a moderate degree of severity, the nuclear intoxication index varied from 0.3 to 1.0, the indicators of the nuclear intoxication index of more than 1 characterised the serious condition of the patient.

For microbiological studies, the contents of bullae, wound contents, necrotic tissues, and puncture aspiration fluid were taken along the edges of erythema, closer to the border of inflammation and healthy skin.

Patients with erysipelas were quantified as microorganisms per 1 g of tissue obtained from the wound by the number of colony-forming units (CFU) in 1 ml of the test material.

The antibacterial sensitivity of the isolated microflora was determined using the disk-diffusion method by the diameter of growth suppression in millimetres, depending on the strain.

The sensitivity to antibiotics (penicillin, ampicillin, oxacillin, carbenicillin, cefazolin, cefotaxime, gentamicin, rifampicin, tetracycline, erythromycin, clindamycin, meronema) of the studied microflora was determined using standard discs.

For cytomorphological studies, the specimens were stained according to Romanovsky-Giemsa after fixation, after which a comparative analysis of the dynamics of changes in the cellular composition in wounds in patients of the studied groups was carried out.

To detect changes and correct the immune status, the immune system in patients with various forms of erysipelas was examined. Blood immunophenotyping was carried out, and antigen-positive cells were counted.

The concentration of immunoglobulins A, M, and G was determined.

It should be noted that in patients with complicated forms of erysipelas with varying degrees of severity of the condition at admission, the assessment of the immune status was carried out in conjunction with clinical and laboratory data.

Such an integrated approach made it possible to more accurately assess the degree of immune system disorder and develop the most effective comprehensive treatment.

All the results obtained were entered into a spreadsheet of the object feature and then subjected to mathematical and statistical processing using modern STATISTICA for Windows application packages (version 7.0).

Quantitative data of normally distributed features are presented in the form of arithmetic mean, standard deviation, and representativeness error. In the paired comparison of normally distributed quantitative characteristics, the Student's test (t) was used.

RESULTS AND DISCUSSION

All patients in the study group and the comparison group underwent temperature monitoring. Body temperature was measured in all patients of both groups twice a day daily.

Statistically significant normalisation of temperature in the study group occurred on the 6th day (p=0.05), while in the comparison group, this indicator was determined on the 10th day.

In patients with complicated forms of erysipelas, haematological parameters were monitored, as well as the dynamics of the Calf-Calif index in the course of the treatment proposed by us (on the 1st, 4th, 7th, and 12th days from the beginning of hospitalisation).

On the 4th day after treatment, the leukocyte index of intoxication in the study group decreased to 2.8±1.2 units (p=0.379). On the 7th day of treatment, the leukocyte index of intoxication decreased to 1.2±0.6 units, while in the comparison group, this indicator was 3.5±0.6 units (p=0.008). On the 12th day, in the study group, the leukocyte index of intoxication normalised and amounted to 0.8±0.4 units, in the comparison group, this indicator did not reach the norm, and its value was 2.3±0.6 units (p=0.036).

When analysing the dynamics of leukocytes, a significant decrease was observed in the study group on the 4th day (p=0.045), and this dynamic persisted up to the 7th day from the moment of hospitalisation (p=0.048). When comparing the two groups in terms of erythrocyte sedimentation rate, a statistically significant decrease in this indicator was observed in the study group on the 4th day compared to the comparison group (p=0.032).

According to the Kalf-Kalif index, there is a statistically significant decrease in the indicator on the 7th day to 1.2±0.6 units (p=0.008); by the 12th day - up to 0.8±0.4 units (p=0.036).

We took smears - prints on the 1st, 4th, 7th and 12th days from the moment of hospitalisation of patients with complicated forms of erysipelas. The cytological examination was carried out in 38 patients of the study group and 33 patients of the comparison group. On the first day of admission, all patients of the compared groups have a necrotic type of cytogram, which indicates the height of the pathological process. During treatment on the 4th day, a statistically significant decrease in the necrotic type of cytogram was observed in the study group (p=0.045). The frequency of degenerative-inflammatory changes was significantly higher in the comparison group on day 7 (5.3 vs. 42.4%, p=0.001), as well as an increase in the regenerative type of cytograms (65.8 vs. 15.2%, p=0.001) in the study group. The proportion of

regenerative-inflammatory type in the compared groups on day 7 is statistically insignificant (p=0.349).

On the 12th day, a statistically significant predominance of the regenerative type of cytogram was observed in the study group (86.8 vs. 63.6%, p=0.045) and a decrease in the proportion of the regenerative-inflammatory type (13.2 vs. 36.4%, p=0.045). The above data indicate the effectiveness of the treatment proposed by us, which is confirmed by the appearance of a regenerative type of cytogram in the study group as early as the 7th day.

Microbiological examination was carried out on 40 patients in the study group and 37 patients in the comparison group. In both groups, resistance of the inoculated microorganisms to penicillin, ampicillin and carbenicillin, as well as high sensitivity to cefotaxime, gentamicin, and meronema, are noted.

The differences between the indicators in the compared groups were determined using the Fisher angular transformation. There are no statistically significant differences between the study group and the comparison group for this feature (p>0.05). A study of the microbial landscape sown from the site of the pathological process in complicated forms of erysipelas was also carried out.

Most often, Staphylococcus aureus was inoculated (in 60.0% in the study group and 59.5% in the comparison group), Pseudomonas aeruginosa in second place (32.5% and 35.1%, respectively), followed by epidermal staphylococcus (17.5 and 16.2%), acinetobacter (10.0 and 10.8%), Escherichia coli (2.5% and 5.4%). Hemolytic streptococcus was inoculated in the study group only in 12.5%, in the comparison group in 16.2%, and only in the association of microbes, which is associated with the difficulty of diagnosing this microorganism and the rapid attachment of other pathogenic and opportunistic flora to the pathological process. The main group and the comparison group are comparable in terms of these indicators (p=0.998).

Quantitative analysis of microbes was determined in 50 patients of the study group and the comparison group. The number of microorganisms per 1 gram of tissue in the study group on the 5th day was statistically significantly less than in the comparison group (p=0.045), the microbial number was below the threshold value, which indicates the effectiveness of the proposed treatment method.

We studied the dynamics of changes in some immunogram parameters in patients with complicated forms of erysipelas in the study group and the comparison group. Immunological studies were carried out on days 1-4 and 11-15.

On the 11th-15th day, a significant decrease in leukocytes in the study group was observed (p=0.001). There are no statistically significant differences in the absolute number of lymphocytes in the compared groups, in percentage terms, on the 11th-15th day, there is a significant increase in lymphocytes in the study group (p=0.009). The absolute number of T-lymphocytes in the compared groups is insignificant (p=0.482), while in percentage terms, an increase in T-lymphocytes in the study group is observed on days 11-15 (p=0.050). The phagocytic index significantly increased in the study group on the 11th-15th day of treatment (p=0.049). The phagocytic number in the compared groups does not differ significantly. The level of immunoglobulin in the study group significantly decreased on the 11th-15th day of treatment in comparison with the indicator of the comparison group, which indicates a decrease in the activity of the process in the group where we carried out complex treatment. There were no statistically significant differences in immunoglobulin A and M levels in the compared groups. We also conducted a study of the immunological status using level 1 tests in 57 patients with complicated forms of erysipelas. The study was carried out on 31 patients in the study group and 26 patients in the comparison group.

CONCLUSION

On the 11th-15th day, there was a significant increase in lymphocytes in the study group (p=0.009), which amounted to 29.8±1.3% versus 25.1±1.2% in the comparison group. The phagocytic index significantly increased in the study group (p=0.049), amounting to 48.2±1.7 versus 43.4±1.7 in the comparison group. The level of immunoglobulin O in the study group significantly decreased (p=0.001), amounting to 14.8±0.5 g/l in comparison with the indicator of the comparison group - 17.8±0.5 g/l, which indicates a decrease in the activity of the pathological process in the main group, where optimised treatment was carried out. Against the background of systemic enzyme therapy with flavoenzyme, a significantly early increase in all studied subpopulations of lymphocytes was noted: T-lymphocytes, helpers/inducers, suppressors/cytotoxic lymphocytes, natural killers, B-lymphocytes, a decrease in the leukocyte index of intoxication, and the sedimentation rate of erythrocytes. The surgical method of treatment developed and introduced into clinical practice using plasma technologies, early necrectomy with single-stage autodermoplasty in the complex treatment of complicated forms of erysipelas is effective and allows early

relief of the purulent-inflammatory process and prevents the development of further complications.

The use of the proposed method of complex surgical treatment of complicated forms of erysipelas in practice made it possible to reduce the frequency of complications in this nosology in the comparison group from 38.6% of the comparison group (p=0.003) to 14.3% in the study group, to reduce the number of neurotrophic disorders from 26.3% of the control group (p=0.009) to 8.4% in the study group, which ultimately led to a reduction in the patient's hospital stay from 27.0±0.4 in the comparison group to 12.0±0.4 days in the study group (p=0.001).

Conflict of interest - The author declares no conflict of interest.

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YUMSHOQ TO'QIMALARNING SARANASNING NEKROTIK TURLARINI DAVOLASH USULLARINI TAKOMINLASHTIRISH

Qorixonov D.N.
Toshkent tibbiyot akademiyasi

ABSTRAKT

Ushbu tadqiqotning maqsadi saramasning murakkab shakllari bo'lgan bemorlarni davolash natijalarini bir qator o'ziga xos vazifalarni yechish orqali yaxshilashdan iborat edi: saramasning murakkab shakllari bo'lgan bemorlarda immunologik maqomi holatini o'rganish; saramasning murakkab shakllari bo'lgan bemorlarni davolashda tizimli fermentlar terapiyasining samaradorligini o'rganish; saramasning murakkab shakllari bo'lgan bemorlarda oksitotsinning terapevtik tadbirlar bilan birgalikda samaradorligini o'rganish; saramasning murakkab shakllarini kompleks davolashda plazma texnologiyasi yordamida davolashning jarroxik usulini, bir bosqichli dermoplastikali erta nekrektomiyani ishlab chiqish va klinik amaliyotga joriy etish; klinik sinov samaradorligini o'rganish. Olib borilgan tadqiqotlar asosida biz klinik amaliyotda birinchi bo'lib murakkab saramas shakllarini davolashda plazma texnologiyalari va erta nekrektomiyani bir bosqichli dermoplastika bilan birlashtiradigan usulni qo'lladik. Saramasning murakkab shakllarini davolashda birinchi marta oksitotsin jarrohlik davolash bilan birgalikda ishlatilgan, uning ta'siri yuqumli agentni hujayra ichidagi depodan olib tashlashga qaratilgan va uning samaradorligi isbotlangan. Qabul qilingan chora-tadbirlar bilan birgalikda patologik jarayon hududidagi mikroorganizmlarni yo'q qilishga yo'naltirilgan antibakterial terapiya rejimi ishlab chiqildi. Qo'shimcha davolash sifatida, ilgari tavsiya etilgan davolash rejimlaridan farqli o'laroq, tizimli ferment terapiyasining preparati - flogenzim ishlatilgan.

Kalit so'zlar: saramas, yumshoq to'qimalarning nekrozi, ferment terapiya

ОПТИМИЗАЦИЯ МЕТОДОВ ЛЕЧЕНИЯ НЕКРОТИЧЕСКИХ ФОРМ РОЖИСТОГО ВОСПАЛЕНИЯ МЯГКИХ ТКАНЕЙ

Корихонов Д.Н.
Ташкентская медицинская академия

АБСТРАКТ

Целью настоящего исследования явилось улучшение результатов лечения больных с осложненными формами рожистого воспаления путем решения ряда конкретных задач. На основании проведенных исследований в клинической практике в лечении осложненных форм рожи использован способ, сочетающий плазменные технологии и раннюю некрэктомию с одномоментной аутодермопластикой. В лечении осложненных форм рожи в комплексе с хирургическим лечением использован препарат окситоцин, действие которого направлено на элиминацию возбудителя инфекции из внутриклеточного депо, и доказана его эффективность. В комплексе с проводимыми мероприятиями, разработана схема антибактериальной терапии, направленная на элиминацию микроорганизмов из зоны патологического процесса. В качестве дополнительного лечения, в отличие от предложенных ранее схем лечения, был использован препарат системной энзимотерапии - флогэнзим.

Ключевые слова: рожистое воспаление, некроз мягких тканей, энзимотерапия