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RESULTS OF TREATMENT OF PURULENT SOFT TISSUE DISEASES ON AN OUTPATIENT BASIS

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Summary,
The results of a study of 118 patients with purulent diseases of soft tissues on an outpatient basis were studied. All examined patients were divided into two groups depending on the method of treatment: group I included 62 patients with purulent diseases of soft tissues, who received wound sanitation with 25% dimethyl sulfoxide solution with levomekol ointment under gauze bandages as local treatment. In the main group II, 56 patients received surgical treatment of a purulent focus, debridement and application of wounds with 25% dimethyl sulfoxide in combination with an electroactivated aqueous solution (EAS).
The results of the study showed that the use of a 25% solution of dimethyl sulfoxide in combination with an electro activated solution accelerates the cleansing and healing of the wound process by 2-3 days and is a more economical, simple and convenient method for treating purulent wounds on an outpatient basis.
Key words: EAS (Electrified aqueous solution), dimethylsulfoxide, purulent wound.

РЕЗУЛЬТАТЫ ЛЕЧЕНИЯ ГНОЙНЫХ ЗАБОЛЕВАНИЙ МЯГКИХ ТКАНЕЙ В АМБУЛАТОРНЫХ УСЛОВИЯХ.

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Резюме

Было изучена результаты исследования 118 больных с гнойных заболеваний мягких тканей в амбулаторных условиях. Все обследованные больные в зависимости от метода лечения разделены на две группы: в I группу включены 62 больных гнойными заболеваниями мягких тканей, которым как местное лечение использовалось санация раны 25% раствором диметилсуьфоксида с наложением мазью левомеколь под марлевые повязки. Основной II группы 56 больные получили хирургическую обработку гнойного очага, санация и аппликацию ран с 25% ним диметилсульфоксидом в комбинации с электроактивированном водным раствором (ЭАР).
Результаты исследование показали, применение 25% раствора диметилсульфоксида в комбинации с электроактивированным раствором ускоряет очищения и заживления раневого процесса на 2-3 дня и является более экономичным, простым и удобным методом лечения гнойных ран в амбулаторных условиях.
Ключевые слова: ЭАР (Электроактивированный водный раствор), диметилсульфоксид.Гнойная рана.

Actuality

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Infection in surgery occupies one of the main places and determines the nature of many diseases and postoperative complications. Most patients with purulent-inflammatory diseases account for 1/3 of all surgical patients, most postoperative complications are associated with purulent infection. Infection remains a difficult, complex and very important problem in surgery. (Struchkov V.I., V.K. Gostishchev. Yu.V. Struchkov. 1984. p 5).

The significance of the problem of surgical infections of soft tissues at the present stage is clearly demonstrated by the fact that in the structure of primary referral to a general surgeon, their frequency reaches 70% (Saveliev B.C. et al., 2009). Despite the introduction of high technologies in modern surgery, the problems of surgical infection remain one of the priorities (Svetukhin A.M., Amiraslanov Yu.A., 2003). The change in clinical symptoms and the course of surgical infection at the present stage is manifested in an increase in the number of severely flowing complicated forms of pyoinflammatory diseases that are not amenable to standard treatment; lengthening the duration of treatment, especially at the hospital stage; an increase in cases of erased forms and atypical course of surgical infection (Fedorov V.D., Svetukhin A.M., 2007). An increase in the number of polyantibiotic-resistant pathogens of purulent-inflammatory processes creates difficulties in prescribing adequate initial empirical therapy (Sidorenko C.V., 2003). Bacterial soft tissue infections are often polymicrobial (Bowler P.G. et al., 2001).

It is known that the problem of microflora resistance makes the fight against surgical infection much more difficult. The use of physicochemical methods in the treatment of purulent diseases of soft tissues is one of the effective methods for the treatment of purulent diseases of soft tissues, in which the problem of microflora resistance does not arise (Safoev B.B., Boltaev T.Sh., 2020, Safoev B.B. , Yarkulov Sh.Sh. 2021).

We have sufficient experience in the use of a chemical preparation of a 25% solution of dimethyl sulfoxide in the treatment of purulent diseases of soft tissues. Positive results were obtained in the treatment of purulent diseases of soft tissues with the use of a 25% solution of dimethyl sulfoxide in the complex of treatment. (Safoev B.B., Boltaev T.Sh., 2020).

A number of authors in their work give preference to the use of electroactivated aqueous solutions of EAR in the treatment of purulent diseases of soft tissues of various etiologies. (Gridin A.A., Koshelev P.I. 2005, Alekseevina V.V., 2013).

For the preparation of an electroactivated aqueous solution, the Apparatus NPF "Espero-1" was developed in 1998 by domestic scientists, employees of the Tashkent Institute of SredazNIIgaz S.A. Alekhin. The Espero-type bioelectroactivator is approved by the Pharmaceutical Committee of the Republic of Uzbekistan for the preparation of drugs used in medical and clinical practice and was widely used by employees of the Research Institute named after V.V. Vakhidov and clinics of the Tashkent State Medical Institute No. 2.

The aim of the study was to determine the effectiveness of the use of a 25% solution of dimethyl sulfoxide and EAR in combination with a 25% solution of dimethyl sulfoxide in the treatment of purulent diseases of soft tissues on an outpatient basis.

Material and methods

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The results of a study of 118 patients with purulent diseases of soft tissues who received outpatient treatment at the Family Polyclinic No. 6 of the Bukhara City Medical Association for the period 2018-2021 were studied. All examined patients were divided into two groups depending on the method of treatment: Group I included 62 patients with purulent diseases of the soft tissues, who received wound sanitation with a 25% solution of dimethyl sulfoxide with application of levomekol ointment under gauze bandages as a local treatment.
56 patients of the main group II received surgical treatment of a purulent focus, debridement and application of wounds with 25% dimethyl sulfoxide in combination with an electroactivated aqueous solution (EAS). (Table 1).

Distribution of patients depending on the type of therapeutic measures

Groups of patients with soft tissue wounds	Treatment method: after surgical treatment
Comparison group Group I (n=62)	Levomekol ointment under a gauze bandage with a solution of a 25% solution of dimethyl sulphate foxid.
Main group Group II (n=56)	25% dimethyl sulfoxide solution in combination with EAS.

During the study, the clinical effectiveness of the treatment methods was evaluated using the dynamics of biochemical parameters and the rate of wound healing.

The predictive coefficient (PC) of the course of the wound process was determined by the formula of M.F. Mazurik (1984):

$$PC = \frac{TPP\ (total\ protein\ plasma)}{TPWD\ \ (total\ protein\ wound\ detachable)}$$

In all patients, pH was measured in dynamics - the measurement of wound exudation.

Taking into account the properties and mechanism of action of various types of biologically active solutions to the wound process; - "electroactivated anolyte solution" EAS-A we used in the treatment of the first phase of purulent-surgical disease of soft tissues.

"Electroactivated catholyte solution" EAS-K was used in the treatment of the second phase of purulent-surgical diseases of soft tissues. EAS-A and EAS-K were obtained using the Espero 1 apparatus. ("The use of EAS in medicine" - TF VMCC AMS of the USSR - SPF "ESPERO" - academician V.V.Vakhidov, MD Kasymov, Ph.D. S.A. Alekhin, Candidate of Medical Sciences Kh.I. Iskhakova, Candidate of Medical Sciences I.V. Ovchinnikov.1979).

Results and discussion

The control group was represented by 62 patients. Of the 62 patients of the I group of comparison, 42 (67.7%) patients had purulent wounds after various purulent surgical diseases of the soft tissues, such as phlegmon, abscess, festering hematoma, felon, abscessing boil, bedsore, and 20 (32.3%) - purulent postoperative wounds.

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On the day of admission of the examined patients, an emergency operation was performed to open the purulent focus and sanitize the purulent cavity, and in patients with purulent postoperative wounds, the removal of sutures, revision and sanitation of the wound, followed by treatment with antiseptic solutions. As a local treatment, debridement of wounds with a 25% solution of dimethyl sulfoxide in combination with Levomekol ointment under aseptic gauze dressings was additionally used.

The study of the dynamics of biochemical parameters and the rate of wound healing in patients with purulent diseases of soft tissues of group I are shown in Table 1.
In the first days of wound treatment, the pH of the wound environment was 4.1±0.32; wound exudate protein 56.7±1.22 (g/l); total blood protein 59.8±2.11 (g/l); PC 1.05±0.04.

Table 1

Dynamics of biochemical parameters and rate of wound healing in patients of group I (n=62)

Indicators	Observation time				
	Day of treatment	3 day	5 day	7 day	10 day
Wound environment pH	4,1±0,32	4,6±0,28	4,9±0,21*	5,2±0,23***	6,8±0,33
% reduction of the wound surface	0	0	1,7±0,11***	2,6±0,12**	2,9±0,14
Wound exudate protein (g/l)	56,7±1,22	54,7±2,28	51,3±2,14*	48,6±2,2	42,1+1,18
Total blood protein (g/l)	59,8±2,11	62,6±2,36	66,4±2,20	69,4±2,7	72,6±2,80
PC according to M.F. Mazuryka	1,05±0,04	1,14±0,05	1,29±0,06*	1,42±0,07*	1,72+0,05

Note: * - differences relative to the data of the previous day are significant (* - P<0,05, ** - P<0,01, *** - P<0,001)

Against the background of complex treatment with the use of a 25% solution of dimethyl sulfoxide, by day 3, the pH of the wound medium was 4.6 ± 0.28, that is, there was a shift to the neutral side. The protein content in the wound exudate decreased to an average of 54.7±2.28

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g/L. Total blood protein 62.6±2.36 (g/l); The recalculation of PC revealed its growth to an average of 1.14±0.05 units.
By the 5th day of treatment, the pH of the wound medium was closer to the neutral medium (4.9±0.21). The daily percentage of reduction in the area of the wound surface averaged 1.7±0.11%. Wound exudate protein decreased to an average of 51.3±2.14 g/l. Total blood protein 66.4±2.20 (g/l); At the same time, PC according to M.F. Mazurik was equal to 1.29 ± 0.06 units.
By 7-10 days of treatment, the pH of the wound environment shifted closer to neutral values of 5.2±0.23 and 6.8±0.33. The decrease in the area of the wound surface reached an average of 2.6±0.12% and 2.9±0.14%. Wound exudate protein decreased to 48.6±2.2 g/l and 42.1±1.18 g/l. Total blood protein 69.4±2.7 (g/l) and 72.6±2.80 g/l; PC was equal to 1.42±0.07 units and 1.72+0.05 units.
At the time of admission, the microbial contamination of the wound was 108 mt/g. After surgical treatment of the wound and local application of a 25% solution of dimethyl sulfoxide, it decreased by 4 orders of magnitude, during the treatment it was further reduced, and by 2-3 days of treatment, the microbial contamination of the wound in these patients was at or below the critical level, amounting to while 103 mt/g - 102 mt/g tissue. If necessary: the presence of hyperthermia, the clinic of bacteremia, antibiotic therapy was carried out, taking into account the sensitivity of the wound microflora.
The study of the dynamics of wound cleansing and healing in group I patients revealed the following: the use of a 25% solution of dimethyl sulfoxide on wounds in the complex treatment of patients with purulent diseases of the soft tissues of the body contributed to the complete cleansing of wounds from infection by 7.8 ± 0.4 days of treatment. By 7.0 ± 0.3 days, active resorption of the infiltrate around the wound was observed. The beginning of the appearance of granulations was noted by 9.5±0.6 days of treatment, and epithelialization by 12.0±1.5 days. These data are confirmed by cytological studies. So, on the third day, in cytological preparations, a large number of destructive and degeneratively altered leukocytes were determined, mainly with an incomplete and perverse type of phagocytosis.
In 56 patients of group II with various purulent wounds, the effectiveness of topical application of 25% dimethylsulfocide in combination with an electroactivated aqueous solution was studied on the process of healing purulent wounds.
As noted above, in the treatment of the examined group II patients with purulent diseases of soft tissues, taking into account the antibacterial and reparative properties of EAR, EAR-A was used in the first phase of the wound, and EAR-K was used during the transition of the wound process to the second phase for debridement and application of the wound. The results of the analysis of biochemical parameters and the rate of wound healing in group II patients are shown in Table 2.

All analyzed biochemical parameters and the rate of wound healing in patients with purulent diseases of soft tissues of group II on the day of admission, as in the first group, were significantly low.

Dynamic control of the pH of the wound medium, the percentage of decrease in the wound surface and the indicators of protein PA according to M.F. Mazurik revealed the following: on the day of admission, the initial pH level of the wound medium was low - 4.1 ± 0.31 (acidosis). Wound exudate protein averaged 56.2.9±2.36 g/l. PC according to M.F.

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Mazurik at the same time averaged 1.1±0.04. On the third day of treatment, the pH of the wound medium recovered to 5.2 ± 0.22, the daily percentage of wound surface reduction was 2.7 ± 0.22%, wound exudate protein 43.8 ± 2.11 g/l, PC for M .F. Mazurik was equal to 1.58±0.05.

Table 2

Dynamics of biochemical parameters and healing rate wounds in patients with purulent diseases of soft tissues Group II (n=56)

Indicators	Observation time				
	Day of treatment	3 day	5 day	7 day	10 day
Wound environment pH	4,1±0,31	5,2±0,22***	6,6±0,32*	7,1±0,23	7,3±0,21
% reduction of the wound surface	0	2,7±0,22***	3,9±0,17***	4,2±0,22	4,4±0,26
Wound exudate protein (g/l)	56,2±2,36	43,8±2,11**	41,4±2,61	-	-
Total blood protein (g/l)	62,6±1,88	69,6±3,32	72,2±2,96	72,6±2,77	74,6±2,87
PC according to M.F. Mazuryka	1,11±0,04	1,58±0,05***	1,74±0,03***	-	-

Note: * - differences relative to the data of the previous day are significant
(* - P <0,05, ** - P <0,01, *** - P <0,001)

On the fifth day of treatment, all these parameters were within normal limits. So the pH of the wound medium averaged 6.6±0.32, the percentage of decrease in the area of the wound surface per day was 3.9±0.17%. PC according to M.F. Mazurik was equal to 1.74±0.03.
By 6-7 days, the pH of the wound medium was significantly neutral. The daily decrease in the area of the wound surface was 4.2±0.22%. It should be noted that the normalization of these indicators of the wound process in patients of the comparison group was observed only on the 9th-10th day of treatment. As our study shows, with the use of local sanitation with a 25% solution of dimethyl sulfoxide in combination with EAR, by 5-7 days of treatment, all pH

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indicators of the wound environment and the rate of wound healing returned to normal. In our opinion, this is mainly due to the positive effect of complex treatment with the use of local sanitation with a 25% solution of dimethyl sulfoxide in combination with an electroactivated aqueous solution.
The principles of antibiotic therapy in patients of group II were the same as in the first group.

A comparative analysis of the dynamics of indicators of the terms of cleansing and healing of wounds in patients of groups I and II revealed the following (Fig. 1).

The study of the dynamics of cleansing and wound healing in patients of group II revealed the following: complete cleansing of wounds from infection was observed by 5.8 ± 0.5 days of treatment. By 5.0 ± 0.3 days, active resorption of the infiltrate around the wound was observed. The beginning of the appearance of granulations was noted by 6.3±0.4 days of treatment, and epithelialization by 8.5±0.7 days. These data are confirmed by cytological studies.

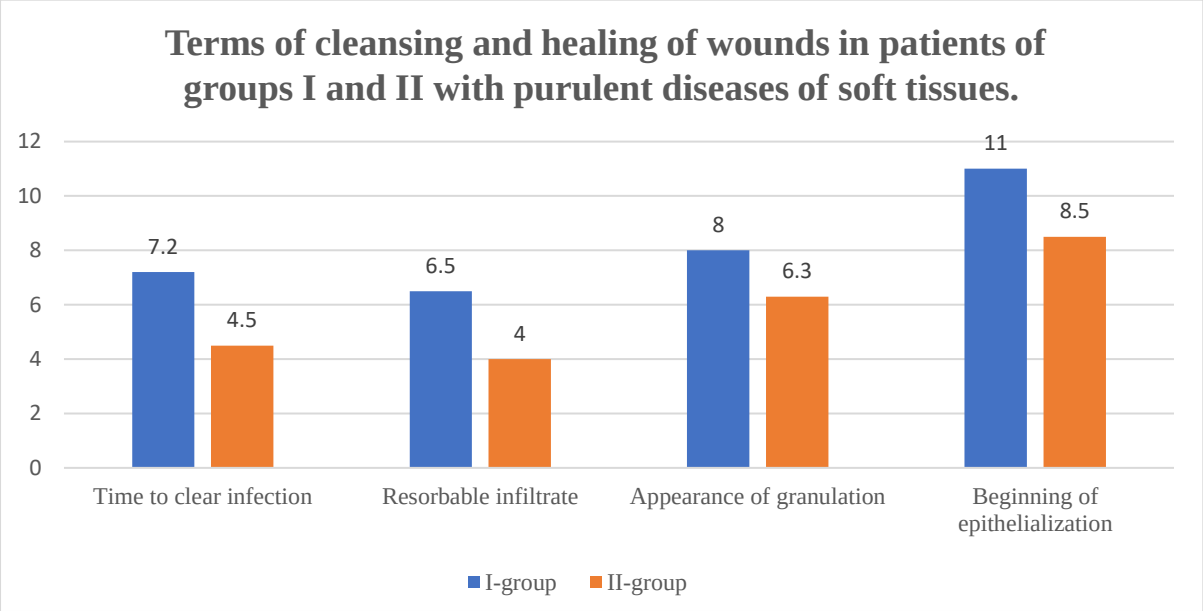

Fig. 1 Terms of cleansing and healing of wounds in patients of groups I and II with purulent diseases of soft tissues.

As can be seen in Fig. 1. Comparative analysis of the indicators of the timing of wound cleansing and healing in patients of groups I and II revealed a significant lead in terms of cleansing and healing of wounds in patients of group II by 2-3 days compared to the comparison group.
The average duration of treatment for patients in group I was 11.0±1.5 days. When used in the treatment complex, a 25% solution of dimethylsufocide in the complex with EAS, the average duration of outpatient treatment was 8.5 ± 0.8 days on average.

Thus, our study showed that the use of a 25% solution of dimethyl sulfoxide in combination with EAS in the local treatment of purulent wounds is an effective method. At the same time, the transition from the first phase of the wound process to the second, as well as the time for

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cleansing and healing the wound, is reduced by an average of 2-3 days, which in turn reduces the time for outpatient treatment and is cost-effective. .

Conclusion

1. The use of a solution of an electroactivated solution of EAS-A and EAS-K is an effective, simple, convenient and economical method of physicochemical treatment of purulent wounds on an outpatient basis.

2. The use of EAS-A solution effectively affects the process of cleansing and healing of purulent wounds.

3. The use of EAS solution in the treatment of purulent diseases of soft tissues on an outpatient basis helps to reduce the average duration of outpatient treatment, thereby being cost-effective.

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