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"MECHANISMS OF ACTION OF ELECTROACTIVATED AQUEOUS SOLUTIONS AND THEIR APPLICATION IN PURULENT SURGERY"

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"МЕХАНИЗМЫ ДЕЙСТВИЯ ЭЛЕКТРОАКТИВИРОВАННЫХ ВОДНЫХ РАСТВОРОВ И ИХ ПРИМЕНЕНИЕ В ГНОЙНОЙ ХИРУРГИИ"

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Abstract

Electroactivated water solutions (EWS) have: bactericidal, immunocorrective, detoxifying properties, stimulating the processes of oxidative phosphorylation and tissue respiration, is a stimulant of reparative and physiological regeneration. Currently, EWS are the means of choice in the local treatment of purulent infectious processes - carbuncles, abscesses, boils, phlegmon, hydradenitis. For topical application and treatment of purulent wounds of the EWS; wetting bandages and tampons with them for 3-7 days, with wound treatment 3-5 times a day, the timing of cleansing the wound from infection and wound healing is accelerated, as well as the duration of inpatient treatment of patients is reduced by an average of 1-2 days, than with traditional treatment.

Key words: electroactivated water solutions (EWS), purulent wound.

Relevance

Electroactivated aqueous solutions are commonly known as "living" water. This name has taken root due to the amazing properties of activated solutions to have a healing effect and prevent many diseases. Scientific research using modern methods of morphology, immunology, biochemistry, microbiology, biophysics of the therapeutic and biostimulating properties of electroactivated solutions for the first time in the world was carried out by scientists from Uzbekistan under the guidance of Academician V. Vakhidov.

The priority of scientists of Uzbekistan in the development of the theory and principles of electroactivation of aqueous solutions and the design of devices for the production

of electroactivated aqueous solutions (EAW) is secured by a number of patents and copyright certificates. All this underlies the developed clinical methods for the use of EVR in various fields of medicine. Electroactivated aqueous solutions with antiseptic action, stimulating tissue regeneration action, are used to treat primary and secondary purulent wounds (mastitis, boils, abscesses, carbuncles, felons, trophic ulcers, hydradenitis, phlegmon, osteomyelitis, paraproctitis, gangrenous conditions) and postoperative suppuration - A.E. Ataliev. A.Kh. Yangiev. D. S. Gitelman,Kh.Ya.Karimov.[1;4;5;] Electrochemical activation of aqueous solutions is technically implemented by electrochemical action on an aqueous solution in the zone of a polarized electrode of an electrochemical system, for example, a diaphragm electrolyzer. In the process of studying the electrolysis of various aqueous systems in a diaphragm electrolyzer, a previously unknown phenomenon of conservation of the electrode polarization energy in the form of potential energy in the electrode medium was discovered, which significantly changes its reactivity in chemical reactions. This phenomenon was called electrochemical activation of liquid media. [1;2]

The appearance and conservation of potential energy in a liquid is due to the activation (excitation) of atoms, ions and molecules in the liquid itself, as well as changes in the properties and state of the liquid itself. The change in these parameters is achieved by using the energy of the metastable state of substances as a catalyst for chemical reactions after non-equilibrium electrochemical action.

In this case, the achievement of the effect is ensured by the presence of a metastable, excited state of the liquid (water) after a nonequilibrium unipolar electrochemical action, i.e. electrochemical activation of water. An electrically activated liquid medium has abnormal physical and chemical properties, one of which is biological activity, including bactericidal properties and properties of a stimulant of metabolic processes. Electroactivated aqueous solution has: antiseptic, immunocorrective, detoxifying properties, stimulation of oxidative phosphorylation and tissue respiration, stimulator of reparative and physiological regeneration.

In the process of electrochemical activation of an aqueous solution, the "active" oxygen formed in the anode zone has a high bactericidal effect of the anolyte and its analogues on the microbial cell. [1;2] EVR proved to be very effective in surgery. Currently, EVRs are the means of choice in the local treatment of purulent infectious processes - carbuncles, abscesses, phlegmon, felons, osteomyelitis, and a good prophylactic in "clean" surgery. EVR solution is used in the form of irrigations, instillations, washings, wetting dressings and tampons to accelerate wound healing. The procedures were carried out for 3-7 days with the treatment of wounds 3-5 times a day. [4;5;7;8;10;11;]

A comparative evaluation of the results showed the effectiveness of the use of electroactivated aqueous solutions in the local treatment of acute purulent surgical infection compared to traditionally used drugs. The method of treatment of purulent surgical infection using electroactivated aqueous solutions is economically low-cost and reduces the time of treatment of patients with acute purulent surgical infection. [eleven; 2013. No. 2 (67)].

Materials and Methods

In the period from 2019 to 2020, 84 patients with purulent diseases of soft tissues were examined in the clinical base of the Bukhara State Medical Institute: Abscess 29 (34.5%), Phlegmon 16 (19.0%) Furuncle 19 (22.6%), carbuncle 5 (5.9%) and hidradenitis 11 (13.1%) postoperative purulent wounds 4 (4.7%). I-control group consisted of 47 (55.9%) patients who used traditional methods of treatment: debridement of the wound with antiseptics and levomekol ointment under bandages. Group II consisted of 37 (54.1%) patients who used local sanitation and dressings moistened with electroactivated solutions. As the main criterion for evaluating the results of treatment of various groups, the terms for the complete development of tissue granulations, wound healing and the average duration of a bed-day were studied.

Results and its Discussion

When using EVR in the local treatment of purulent wounds in the second group of patients, other antiseptic and antibacterial agents were not used both in local and general treatment.

A characteristic feature of the drug was its analgesic effect - all patients noted the rapid disappearance of pain. The use of the EVR preparation accelerated the regenerative processes, which was manifested in the faster appearance of granulation tissue, complete healing, and a reduction in outpatient treatment.

So, in patients who received conventional treatment, the average rate of complete formation of granulation tissue was 6.3 + 0.06 days, wound healing 8.5 + 0.4 days, the average number of bed-days was 8.5 + 0.05 days. For comparison, in patients receiving EVR, the average rate of complete development of granulation tissue was 4.6+0.75 days, healing - 6.5+0.75 days, there was a decrease in the average rate of bed-days by 6.65+ 0.5 days.

The method of treatment used is based on the surgical treatment of a purulent focus (opening, excision, removal of purulent-necrotic masses) followed by washing or drainage, as well as the introduction of tampons or dressings with an electroactivated

anolyte solution. At the same time, by the end of the first day of treatment in the wound, the amount of purulent discharge and necrotic tissues decreases sharply, edema and infiltration decrease. With a small size of the wound, necrotic tissues are completely rejected on the 2-3rd day, and a juicy granulation tissue appears. With extensive purulent lesions, necrotic tissues are lysed and rejected on the 3rd-5th day, which creates conditions for the imposition of secondary sutures. After the disappearance of purulent discharge several times during the day, the wound was treated with an electroactivated catholyte solution. At the same time, usually, by 5-6 days, wounds of small size completely healed, the general condition quickly returned to normal in patients, sleep and appetite improved. It should be noted that patients treated with electroactivated solutions did not receive any detoxification therapy, except for electroactivated solutions, however, their condition improved faster than in the group of patients who received traditional drug treatment (antibiotics, detoxification, desensitizing, vitamin therapy, antiseptic wound treatment, application of ointment levomekol).

The use of EVR as an antiseptic agent quickly eliminated purulent discharge by (3.57+0.09) days in the group receiving EVR, and 6.32+0.005 days in the control group), hyperemia by (4.93+0.11) days and by 7.16+0.002 days, respectively), tissue infiltration by (5.55+0.2 days and 8.11+0.006 days, respectively). The use of EVR accelerated the appearance of granulation tissue by (4.6+0.75 days in the EVR group and 6.3+0.06 days in the control group); accelerated complete healing (6.5+0.75 days and 8.5+0.4 days, respectively). The complex use of EVR significantly reduced the average number of bed-days by (6.65+0.5 days in the group receiving EVR, and 8.5+0.05 days in the control group).

Conclusions

1. Electroactivated aqueous solution has: bactericidal, immunocorrective, detoxifying properties, stimulates the processes of oxidative phosphorylation and tissue respiration, is a stimulator of reparative and physiological regeneration.
2. Local application of an electroactivated aqueous solution in the treatment of purulent wounds accelerates the cleansing and healing of the wound by an average of 1.5-2 days.
3. Electroactivated aqueous solution can be used in wide clinical practice in the treatment of purulent wounds.

REFERENCES

1. Отчет "Применение ЭВР в медицине" - ТФ ВМЦХ АМН СССР - НПФ "ЭСПЕРО" - акад. В.В. Вахидов, д.м.н. Касымов, к.м.н. И.М. Байбеков, к.т.н. С.А. Алехин, к.м.н. Х.И. Исхакова, к.м.н. И.В. Овчинников, 1979г.
2. Заключение Ташкентского филиала Всесоюзного научного центра хирургии АМН СССР о не токсичности электроактивированных жидкой системы, используемой в качестве биологически активной системы 15.06.81г.
3. Отчет "Изучение возможности использования спектроскопических методов для изучения физико-химических свойств электроактивированных водных растворов" - г.Санкт-Петербург, НИИОП ВНЦ ГОИ им. С.И. Вавилова, лаборатория люминесценции и фотохимии с.н.с.к.физ.мат. Наук Т.А. Шахвер-зов;
4. Отчет "Клинические испытания электроактивированныхводныхрастворов ЭВР-А, обладающего антисептическим действием, и ЭВР-К, обладающего стимулирующим регенерацию тканей действием, для лечения первичных и вторичных гнойных ран (маститов, фурункулов, абсцессов, карбункулов, панарициев, трофических язв, гидраденитов, флегмон, остеомиелитов, геморроя, парапроктита, гангренозных состояний)" - II ТашГосМи - Ректор, проф. Х.Я.Каримов. Исполнители - гл.вр. НПФ "Эсперо" Д.С. Гительман, зав.каф. факультативной хирургии А.Е. Аталиев.
5. Отчет "Клинические испытания электроактивированных водных растворов ЭВР-А, обладающего антисептическим действием, и ЭВР-К, обладающего стимулирующим регенерацию тканей действием, для лечения первичных и вторичных гнойных ран и послеоперационных нагноений" - I ТашГосМи - ректор, член-корресп. АН РУз, проф. Т.А. Даминов. Исполнители ассистент кафедры общей хирургии Ю.У. Хусаинов, гл.вр. НПФ"Эсперо" Гительман Д.С.; заведующий кафедры общей хирургии, проф., д.м.н. А.Х.Янгиев.
6. Кошелев П.И. Применение элекроактивированных водных растворов в лечении гнойных артритов/ П.И. Кошелев, Д.А. Расчепеев// Вестник экспериментальной и клинической хирургии.-2011.- Т.4, №2.- С.351-354.
7. Гридин А.А. Раствор анолита в лечении гнойных ран /А.А.Грилин //Новые технологии в биологии и медицине. Материалы межрегиональной научно-практической конференции молодых ученых. - Воронеж, 2004.-С.95-97.
8. Кошелев П.И. Гидропрессовая обработка ран раствором анолига в комплексном лечении больных с гнойными ранами/ П.И.Кошелев,

А.А.Глухов,А.А.Гридин//Современные вопросы медицинской науки и практики: сборникнаучных трудов. -Курск, 2004.-С.80-81.

9. Гридин А.А. Оценка эффективности лечения больных гидроврессивной оработкой гнойных ран раствором анолита / А.А.Гр1щин, В.И.Лозинский, Э.В. Тищенко // Университетская наука: взгляд в будущее. - Курск,2005.-С.230-231.
10. Кошелев П.И. Лечение гнойных ран с применением анолита и католита / П.И.Кошелев, К.М.Резников, ААГридин// Системный анализ и управление в биомедицинских системах. - М, 2005. - Т.4, №1.-С.54-56.
11. Алексеевнина В. В., Лебедь А. А., Олифирова О. С. Электроактивированные растворы в лечении гнойной хирургической инфекции // ПМ. 2013. №2 (67).
12. NA.Narzieva, N.Hasanova Communicative competence as a pedagogical model in the classrooms, ACADEMICIA: An international Multidisciplinary Research Journal, volume 10(6),78-81,2020
13. NA Narzieva The concept of defined target technologies and their role in the educational process, Theoretical and Applied science, 2020
14. NA Narzieva. The concept of defined target technologies and their role in the educational process// Theoretical &Applied science, 356-360, 2020
15. NN Atakulovna FACTORS SUPPORTING TEACHING AND LEARNING ENGLISH IN NON-ENGLISH SPEAKING COUNTRIES, ResearchJet Journal of Analysis and Inventions, 2021
16. NN Atakulovna Teaching Vocabulary by Using Digital Technology to Non-Native Learners, " ONLINE-CONFERENCES" PLATFORM, 2021
17. NA Narzieva, ORGANIZING ENGLISH CLASSES REGARDING LEARNERS WISHES, Scientific progress, 2021.