RESEARCH JOURNAL OF TRAUMA AND DISABILITY STUDIES

Volume: 2 Issue: 2 | Feb – 2023 **ISSN: 2720-6866**
http://journals.academiczone.net/index.php/rjtds

Risk Factors in the Origin of Purulent Inflammation of the Face-Jaw Area

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Abstract

The therapeutic complex is subdivided into general measures, including antibacterial, desensitizing, restorative, detoxification and other therapies, and local treatment, which involves ensuring an adequate outflow of purulent exudate from the focus of inflammation, suppressing the vital activity of pathogenic microorganisms, maintaining necrolysis of damaged tissues, reducing interstitial pressure, normalization

Keywords: Maxillofacial region, generalization of the process, purulent-inflammatory diseases.

In the studies of Imenova D.A. et al. (2015) proved that early PTL in the development of a carbuncle in the maxillofacial region contributes to the relief of the inflammatory process, the prevention of complications, and the acceleration of the resolution of the process. The main approach to the choice of the PTL method is the same as in the treatment of a boil, and depends on the stage of the disease, the clinical picture and the individual characteristics of the patient's body. With extensive necrotic areas, it is necessary to use trypsin electrophoresis to accelerate the cleansing of the wound channel. For better epithelialization of the wound during the healing process, suberythemal doses of UV rays are used. With abundant exudation for drying the wound surface, the authors suggest irradiation with infrared rays.

In foreign practice, the dominant component of the treatment of purulent-inflammatory diseases of the maxillofacial region is the use of antibacterial drugs administered in various ways. Pasternack M.S. (2015) repeatedly mentions that systemic antibiotic therapy should be continued until complete recovery of Pasternack MS, Swartz MN. Cellulitis, necrotizing fasciitis, and subcutaneous tissue infections. Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases. Eighth. Vol. 95, St. Louis, MO: Elsevier, 2015:1194-215].

Ngui et al. (2021) proposed a method for the treatment of facial carbuncle, which gave good

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results in a number of cases. The carbuncle was punctured with a needle or a small incision was made through which purulent contents were drained, necrotic tissues were removed, followed by irrigation of the wound 3 times a day with a solution containing 80 mg of gentamicin diluted in 500 ml of saline. This method has been shown to be effective in clinical studies, in which, after two days of regular irrigation, there was a reduction in edema, induration, and erythema, and an average hospital stay of five days. In addition to topical application of the antibiotic, ampicillin/sulbactam 1.5 g or clindamycin 300 mg four times a day was also administered intravenously.

Glinnik A.V. et al. (2012) consider that the complex treatment plan for patients with abscesses and phlegmons of the face and neck is drawn up taking into account the age of the patient, the nature and severity of the purulent-inflammatory process, the type and pathogenicity of pathogens of the purulent or putrefactive-necrotic process, their sensitivity to antibacterial drugs, the presence of concomitant general somatic pathology. The authors also argue that the treatment of this group of patients should be based on a comprehensive implementation of surgical interventions and therapeutic measures. At the same time, surgical methods for the treatment of purulent-inflammatory diseases of the maxillofacial region dominate and consist of the following basic components: primary or secondary surgical treatment of a purulent focus (with the removal of the causative tooth with an odontogenic origin of the inflammatory process) with adequate wound drainage. Particular attention is paid to operational access, which should provide an optimally short path to the purulent focus and at the same time create adequate conditions for the evacuation of exudate without the formation of streaks and pockets [7, 9].

It should be noted that at present, most researchers and clinicians adhere to the concept of therapeutic measures, taking into account the stages of the purulent-inflammatory process and pathophysiological processes occurring in the purulent focus.

At present, the tactics of managing purulent wounds under a bandage using antiseptic and antibacterial agents in the form of ointments, solutions, and powders is widespread. It should be noted that this method, along with advantages, has a significant drawback, which is that the drying of the dressing and the dilution of drugs with pus or wound discharge leads to a decrease in the antiseptic properties of the dressing. In addition, the drug may largely lose its activity due to contact with the exudate released from the purulent focus, and the active substances will not be able to penetrate the entire depth of the infiltrate and the effect will therefore be only superficial. This, according to most authors, does not fundamentally meet the requirements for the management of

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purulent wounds, both in the hospital and on an outpatient basis.

According to Fedot N.V. et al. (2018) the hydrophobic base of ointments, which impairs the possibility of wound cleansing and healing, is their main drawback. Hydrophilic and emulsion-based ointments provide better wound drainage. Also, painful trauma to the surface layers of the wound often occurs due to frequent dressings, as a result of which the healing period increases and coarse keloid scars of the face and neck are formed [6, 8].

Pathogenetic changes occurring in boils and carbuncles significantly reduce the bioavailability of antibacterial

drugs prescribed to patients parenterally, and at the stage of resolution lead to the formation of a coarser scar, which is aesthetically significant, given the localization of the purulent process on the face. Therefore, along with general therapy, special attention is paid to optimally selected local treatment.

After appropriate surgical treatment, evacuation of purulent exudate and installation of drains, antiseptic solutions, multicomponent aerosols and ointments containing antibacterial, anti-inflammatory drugs are used to suppress pathogenic microflora. To stimulate the growth of granulations in the wound, epithelialization and organization of the scar, it is recommended to use indifferent ointments containing bioactive substances and vitamin complexes.

Laureano (2014) believes that topical antibiotics can be used after traditional components of treatment such as surgery and drainage. Choices based on clinical studies are 2% fusidic acid cream, 2% clindamycin gel, and 2% mupirocin ointment (7). These drugs are recommended to be applied to the lesion. Tran (2017) noted minor side effects of the above drugs in the form of contact dermatitis, dryness or itching in the application area. Topical antiseptics can be made in the form of a gel (for example, benzoyl peroxide in various concentrations from 2% to 10%), cream, soap, or solution. Currently, drug interactions with topical antiseptics are unknown. Laureano AC, Schwartz RA, Cohen PJ. Facial bacterial infections: folliculitis. Clinics in Dermatology 2014;2(6):711-4, Frosini SM, Bond R, Loeffler A, Larner J. Opportunities for topical antimicrobial therapy: permeation of canine skin by fusidic acid. BMC Veterinary Research 2017;13(1):345, Tran K, Wright MD. Topical antibiotics for infected dermatitis: a review of the clinical effectiveness and guidelines.

Ointment preparations are also used taking into account the individual intolerance of individual components. Multicomponent ointments are widely known, which have a complex effect on the

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purulent focus, depending on the active substances. Known ointment "Lingezin", which in its composition along with antibacterial drugs (lincomycin and gentamicin) includes protease C, due to which it has a proteolytic effect on purulent and necrotic masses [16].

In addition to ready-made ointment preparations, an option for self-preparation is also possible. So Chuikin S.V. et al. (2019) in the postoperative period quite successfully used the ointment they developed, which contained the following active ingredients: furacillin, lidocaine, dibunol, and as a gel base, a copolymer of styrene with malric anhydride lutrol-127 and water [15].

Kretsu I.I. (2002) revealed an anti-inflammatory and wound-healing effect with the local application of the Timoron ointment, made ex tempore and containing phytoectdisterone, glycerin, lanolin, etc. This ointment also contributed to the restoration of volemic and metabolic homeostasis, the early appearance of fibroblastic cells and granulations in the wound [one].

Gayvoronskaya TV. et al. (2017) noted the effectiveness of the use of proteolytic enzymes in the treatment of purulent-inflammatory diseases after opening the focus, which is due to their necrolytic and anti-edema effect. Enzymes deprive microorganisms of the substrate for nutrition and reproduction, which makes them more sensitive to antibacterial effects. But at the same time, the authors point out the obvious lack of enzymes, which consists in the short duration of their action and the rapid loss of activity within 15-30 minutes. All topical preparations for purulent wounds are unidirectional - either they have an osmotic effect, or antibacterial, or necrolytic [5].

Dregalkina A.A. et al. (2020) proposed a scheme of local treatment, carried out after adequate surgical intervention and based on the principle of selection of drugs and procedures, taking into account the course of the phases of the wound process. Many researchers have noted that extensive wounds produce a significant amount of exudate - up to 0.35 ml/cm2 per day. It is necessary to remove the escaping exudate from the wound surface to prevent reabsorption of toxic decay products of necrotic tissues into the body. At the same time, the normalization of osmotic pressure is also ensured by eliminating Na+ and K+ ions, and as a result, the level of tissue destruction is reduced. The goal of local treatment in phase I (inflammation itself) is to fight infection, while the drugs should have an antimicrobial, dehydrating, necrolytic effect. Based on this, active drainage and irrigation of the wound is shown: antiseptic solutions are used (chlorhexidine bigluconate 0.02-0.05 aqueous solution, miramistin 0.01%, dioxidin 0.1-1% solutions, with putrefactive necrotic process - potassium solution permanganate, boric acid 2-4% solution, 3% hydrogen peroxide solution,

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ozonized solutions), proteolytic enzymes (animal origin - trypsin, plasmin, chymotrypsin, chymopsin, ribonuclease; microbial origin - streptokennase, collagenase, hyaluronidase; plant origin - bromelain, papain, debricil, terrilitin; ointment for enzymatic wound cleansing Iruksol, which contains collagenase), water-soluble ointments (levomikol, levosin, dioxicol, mafenide ointment 10%), osmotically active substances, draining sorbents (polysorb, gelevin, debrisone, cellulose, cellosorb, carbon-sorption tissue dressings, 0.1% solution of novomain, Exalet hydrogel), multicomponent mesh-based wound dressings. The sorption capacity of the wound dressing depends on the rate of exudate absorption and the sorption capacity of the dressing material [7].

In phase II (tissue proliferation), the formation and maturation of granulation tissue occurs, so the goal of local treatment in this period is to stimulate regeneration processes, the dressing should reliably protect the wound from mechanical damage and secondary infection, not stick to the wound, maintain the necessary aeration, stimulate reparative processes . It is advisable to use dressings with fat-soluble antibacterial ointments, stimulants (polyvinox (vinylin), vulnosan, methyluracil ointment, actovegin ointment, solcoseryl ointment, rosehip oil; aerosols: Olazol, panthenol; hydrocolloids and hydrogels - algipor, yalgimaf, kombutek), atraumatic wound dressings (gyapus, waxopran, exalet).

In the III phase of the wound process (healing phase - scar organization and epithelialization), most experts do not recommend the use of antiseptic preparations, except for treating the skin around the wound. The purpose of local treatment in this phase is to accelerate the growth of the epithelium, protect the wound from mechanical damage, and the use of keratoplastic ointments, dressings, and physiotherapy is recommended. Glinnik A.V. et al. (2012) also suggest the use of Solcoseryl, Diavitol, indifferent ointments containing vitamin complexes, keratoplasty, bioactive substances [10].

Of great interest is the use of various physiotherapeutic procedures, which are becoming one of the main parts of local therapeutic measures. Pokhodenko-Chudakova I.O. and Cheshko N.N. (2013) believe that the goal of physiotherapy in HL of MFR is to influence the etiological factor and pathogenetic links of purulent inflammation, sanitation of the focus. The authors also noted that in the absence of contraindications, physiotherapy treatment (PTL) must necessarily be carried out taking into account the phases of the wound process, which were identified by Kuzin M.I. (1977), after adequate surgical intervention and against the background of drug anti-inflammatory therapy. So phase I (inflammation itself) is divided into a period of vascular changes and a period of wound cleansing from necrotic tissues. Given the pathophysiological changes occurring in this phase, after

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surgical treatment of a purulent focus, PTL should have a bactericidal, dehydrating (anti-edematous) effect, reduce pain, and also promote the rejection of necrotic tissues. For this purpose, the following physiotherapeutic methods are recommended: laser therapy, UV radiation, fluctoorization, ultrasonic frequency electric field, microwave therapy, ultrasound therapy, hyperbalic oxygenation, etc. [12].

In phase II (tissue proliferation), the formation and maturation of granulation tissue occurs. At the same time, the methods of physiotherapy used should have an anti-inflammatory effect, improve microcirculation and tissue trophism, create optimal conditions for the regeneration of damaged areas and prevent possible complications. At this stage, you can use: the electric field of ultrasonic frequency, ultraphonophoresis, laser therapy, fluctoorization, drug electrophoresis, magnetotherapy, darsonvalization, etc.

In phase III of the wound process (healing phase - scar organization and epithelialization), PTL should promote further regeneration of damaged tissues, wound epithelialization, formation and reorganization of a postoperative scar with a higher functional and aesthetic result [6]. For this purpose, the use of medicinal electrophoresis, paraffin and ozocerite applications, laser therapy of ultraphonophoresis, etc. is recommended.

To limit exudation in the wound and soft tissue edema, an UHF electric field and low-intensity magnetic therapy are used. UVR, darsonvalization, aeroionotherapy, speleotherapy, halotherapy have antiviral, bactericidal and mycocidal effects. Increased tissue proliferation and regeneration, wound healing occurs with the appointment of DMV-, SMV-, laser therapy, ultrasound, mud, electrophoresis of medicinal substances. With hyperplasia of the connective tissue and a tendency to develop scars and adhesions, darsonvalization, ultratonotherapy, and ultrasound therapy are used. With chronic inflammation in patients, the immunological reactivity of the body changes, so the treatment complex includes factors that have a systemic effect on the body (speleo-, halo-, cryotherapy) [13].

The criteria for choosing one or another physiotherapeutic method of treatment depend mainly on the type and stage of purulent-inflammatory disease of the maxillofacial area, the general condition of the patient, the presence of contraindications, etc.

According to Kravtsevich L.A. (2011) in abscesses and phlegmons, it is advisable to apply local tissue hypothermia at an early stage with a limited pathological focus to slow down the inflammatory response. In the future, PTL is recommended to be carried out only after surgical treatment of the

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purulent focus and ensuring effective drainage of the purulent wound, and not earlier than 3-4 days after the operation, with the obligatory presence of positive dynamics of both general and local indicators. Subject to the above conditions, UVR can be administered to the wound area (starting with 4 biodoses and increasing the intensity of exposure by 2 biodoses every other day, increasing the number of biodoses to 8-10), UHF therapy in an athermic dose (10 min, treatment course - 6- 8 procedures), low-intensity laser irradiation of the abscess or phlegmon area using a scanning technique with a red beam (2-5 minutes per field; the course of treatment is 8-10 procedures). The author also suggests the use of an aspiration drainage system to ensure active drainage of a purulent focus. With the development of anaerobic, putrefactive-necrotic inflammatory process in the tissues of the maxillofacial region and neck, it is possible to use hyperbaric oxygenation. In severe, diffuse purulent-inflammatory processes of the maxillofacial region and neck, extracorporeal methods of detoxification can be carried out with ultraviolet or low-energy laser blood irradiation. [5].

According to Fomichev E.V. et al. (2011) UV rays are effective at the initial stage of furuncle development; hypothermia, which is recommended to be carried out with ethyl chloride after skin treatment with ethyl alcohol; helium-neon laser, which relieves pain, reduces infiltration and collateral edema. After surgical treatment of the purulent focus and ensuring the outflow of exudate, fluctuorization is effective, which promotes the resorption of soft tissue infiltrate. To create optimization of wound epithelialization, UV irradiation is carried out in suberythemal doses. Given the pronounced bactericidal effect of ozone, it is advisable to use local ozonized solutions during surgical treatment of the wound, as well as for the purpose of detoxification [15].

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