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ESTIMATION OF CLINICAL COURSE IN COMPLEX TREATMENT OF LOWER JAW FRACTURES IN PATIENTS WITH IMMUNO CORRECTION

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SUMMARY

An analysis of domestic and foreign literary sources showed that the number of patients with injuries of the maxillofacial region, namely, fractures of the lower jaw and their complications of an infectious nature, not only does not decrease, but rather increases every year. One of the pathogenetic factors of the adverse clinical course of fractures of the lower jaw is a violation of the immune status of the patient's body. In this regard, there is a need to include in the complex therapy of traumatic injuries of the maxillofacial region in order to prevent their complications of individual immunocorrection methods at different stages of the post-traumatic period.

KEYWORDS: maxillofacial region, fractures of the lower jaw, decreased resistance, neurohumoral regulation, correction of immunity, immunostimulating therapy.

The problem of injuries of the maxillofacial region, and in particular fractures of the lower jaw, is one of the urgent problems in surgical dentistry (Malyshev V.A., Kabakov B.D., 2005; Ivashchenko N.I., Ippolitov V.P., 2007). Patients with injuries of the maxillofacial region make up about 30% of all patients treated in hospitals of the maxillofacial surgery, while fractures of the lower jaw account for about 70-85% of all fractures of the bones of the face (Shargorodsky A.G., 2004; Ivasenko P.I., Zhurko E.P., Chekin A.V., Konvay V.D. et al., 2007). Despite the constant improvement of complex treatment, the frequency of complications of fractures of the lower jaw reaches from 10 to 41% (Mubarakova L.N., 2008; Mirsaeva F.Z., Izosimov A.A., 2009), which does not allow us to talk about the effectiveness of existing methods of treatment (Magomedgadzhiev B.G., 2008).

Most authors attribute the increase in the number of patients with purulent-inflammatory processes of the face and neck, as well as complications of injuries with a decrease in the body's resistance. In this regard, the study of immunological disorders at the systemic and local levels is a promising direction in predicting the course and diagnosis of the disease, allowing to expand the understanding of the mechanisms of development of purulent-inflammatory diseases, reparative processes of the maxillofacial region, as well as develop effective methods of therapy [B.C. Agapov, 2005; G.P. Ter-Asaturov, 2005; M.P. Porfiriadis, 2007].

Currently, a lot of attention is paid to immunostimulating therapy, including local immunocorrection - a promising area of immunotherapy, which is actively being introduced into the clinic, including surgical dentistry [L.V. Kovalchuk, L.V., Gankovskaya, 2007; I.E. Tretyakova, 2003; A.C. Simbirtsev, 2004]. Recently, various immunocytokine preparations have been successfully used in practical medicine [L.S. Latyushina, 2005; V.N, Solomin, 2006; E.A. Varyushina., 2007]. Cytokines are short-lived substances and are effective if they are highly localized. Local immunocytokine therapy allows you to create a sufficiently high concentration of the drug, to target specific stages of the wound process and to avoid adverse reactions observed with systemic use of cytokine preparations [L.I. Vinnitsky, 2000; I.A. Snyashchikova, 2001].

In the scientific works the results of the studyof Russian scientistsdescribed below are presented on the use of local immunocytokine therapy in the complex treatment of patients with odontogenic phlegmon and fractures of the lower jaw. In the blood serum of patients with fractures of the lower jaw revealed an imbalance of the immunocytokine profile, most pronounced in patients with multiple fractures. The detected deficiency of pro-inflammatory cytokines and a decreased concentration of TGFr ($p < 0.01$) are risk factors for the development of purulent-inflammatory complications and impaired reparative osteogenesis. In order to eliminate the deficit of cytokines in the complex of therapeutic measures in patients with open fractures of the lower jaw, the local drug “Superlimph” containing a complex of cytokines in combination with ultrasonic cavitation was used locally.

Local immunocytokine therapy in combination with ultrasonic aerosol treatment was carried out as follows: the manipulation was carried out in the position of the patient sitting in the dental chair or lying on the couch. The solution was prepared immediately before use: one ampoule containing 100 micrograms of “Superlymph” dry matter, 200.0 ml of 0.9% sterile

physiological saline was diluted, the bottle was fixed on a tripod stand. Ultrasonic aerosol treatment was carried out using a generator of low-frequency ultrasonic vibrations "URSK-22-N". During the procedure, the torch was gradually moved to different areas of the oral cavity during fractures of the lower jaw and the wound surface with phlegmon, to a distance of 2 cm from the waveguide end to the wound surface, so that exposure was performed for at least 10 seconds on an area of 1 cm. In addition, patients with fractures of the lower jaw were prescribed to rinse the mouth 2 times a day for 9 days with a solution of “Superlimph”. The solution was prepared immediately before use: one ampoule containing 100 μg of dry matter was diluted with 200.0 ml of 0.9% sterile saline.

The researchers concluded that the “Superlimph” drug helps to eliminate the imbalance between the cytokines of the pro-inflammatory and anti-inflammatory groups, and also normalizes the concentration of growth factor - (TGFR) in groups of patients with odontogenic phlegmon and fractures of the lower jaw. The use of a complex of natural cytokines in the treatment of purulent wounds helps to reduce microbial contamination of the wound, shortens the exudation time, and cleanses the wound surface from necrotic tissues.The use of ultrasonic aerosol treatment of wounds with a complex of cytokines significantly increases the effectiveness of treatment.[1]

Similar studies to prevent inflammatory complications in patients with fractures of the lower jaw were carried out by other Russian researchers who used sonic antiseptic solutions as part of the complex treatment of this pathology. The application of physical impact methods was carried out against the background of traditional treatment (immobilization of fragments of the lower jaw, tooth extraction from the fracture line, antibacterial, restorative therapy, analgesics, the appointment of physiotherapy to the fracture area, opening and drainage with suppuration of the bone wound). To assess the effectiveness of the use of ultrasonic aerosol treatment of the oral cavity with various solutions of antiseptics, we studied the dynamics of the species and quantitative composition of the microflora of the oral cavity with the determination of the number of strains and the adhesion of microorganisms in the studied groups. The dynamics of changes in the patient's condition (pain, the presence of traumatic edema, tissue infiltration) by days was analyzed, the terms of inpatient treatment were evaluated. The timing of the relief of clinical manifestations in patients with fractures of the lower jaw was determined by the days of treatment.

Clinical observation of patients with uncomplicated fractures of the lower jaw showed that in the group of patients who underwent traditional therapy, there was a decrease in traumatic edema of the soft tissues in the fracture area for 4-5 days, the pain syndrome stopped for 5-6 days. Temporary disability of patients averaged 32 days. In the group of patients with uncomplicated fractures of the lower jaw, the complex treatment of which included the method of physical exposure with voiced antiseptic solutions,soft tissue edema in the area of fractures decreased by 2-3 days, the pain was stopped by 2-3 days. The total number of days of temporary disability averaged 24 days.

An analysis of microbiological studies revealed that in the oral cavity in patients with fractures of the lower jaw, bacteria were isolated in all cases before ultrasound treatment and were represented by staphylococci, streptococci and their associations. Ultrasonic aerosol treatment of the oral cavity with solutions of sodium hypochlorite, furacilin and physiological saline reduces the contamination of the oral cavity.In the groups in which ultrasonic aerosol treatment of the oral cavity was performed in patients with fractures of the lower jaw, the existing complications were stopped, and in the main group, the combined effect of low-frequency ultrasound with sodium hypochlorite led to the elimination of complications earlier than in the other groups.[6]

According to the results of a scientific study conducted in Uzbekistan by a candidate of medical sciences associate professor Z. Rakhimov, in patients with a purulent-inflammatory process with fractures of the lower jaw there is a pronounced change in the hemostatic system, expressed by the development of thrombohemorrhagic syndrome. Reliable confirmation of the presence of prolonged intravascular coagulation is increasing thrombocytopenia, hyperfibrinogenemia, inhibition of fibrinolysis. Considering the violations detected in various body systems, it was decided to study the effect of systemic enzyme therapy on the course of purulent-inflammatory diseases in fractures of the lower jaw. Wobenzym was chosen as a systemic enzyme therapy drug. Based on the data obtained, systemic enzyme therapy provides a smooth course of the inflammatory process and accelerates recovery. The early inclusion in the treatment regimen of the enzyme therapy method allowed to reduce the level of medium molecular peptides by 2 times, the content of circulating immune complexes by 2.3 times. The level of complement component increased on average by 12-14 days, amounting to 101.6 + 5.62 mg / dl. Low phagocytic activity contributed to a decrease in the number of necrotic cells in the blood and, thereby, a 64%

decrease in the level of reactant of the acute phase of ceruloplasmin. It should be noted that against the background of traditional treatment, a rather slow normalization of the studied indicators of humoral immunity occurred, while there were no significant differences before and after treatment.As mentioned above, in patients with NP fractures complicated by purulent-inflammatory processes, the activity of acid RNAse and cathepsin D naturally increases. Under the influence of conventional therapy in patients of the 1st group, the activity of cathepsin D in neutrophils decreases to 10.7 + 0, 91 μmol / g of protein, and in patients of the 2nd group - up to 5.8 +0.23 μmol / g of protein, which is on average 2 times more than before treatment.

In patients with fractures of the lower jaw with a complicated course of an infectious and inflammatory nature, the accumulation of immune complexes occurs, the pH of the medium changes, which leads to reliable activation of the lysosomal apparatus of neutrophils, which manifests itself in the activation of their enzymes and the labilization of lysosomal membranes. To neutralize the pathological effects of lysosomal proteolytic enzymes, the enzyme preparation Wobenzym can be used.[5,9] The Wobenzym effect is not limited to regenerative processes. It improves microcirculation in the focus of inflammation, accelerates the resorption of hematomas and edema, and normalizes vascular permeability. In addition, a number of authors point to the positive effect of Wobenzym on the course of the inflammatory process, the limitation of autoimmune and immunocomplex processes, and an increase in the body's immunoreactivity. It regulates the functional activity of cells of the macrophage-monocytic system, natural killer cells, stimulates the phagocytic activity of cells. Wobenzym is able to increase the elimination of protein detritus and fibrin deposits in the area of inflammation, accelerates the lysis of toxic metabolic products and necrotic tissue.[2,4]

The Trans-Baikal Territory of the Russian Federation belongs to regions with a low selenium content, on the basis of which it can be assumed that its deficiency in the body of patients with fractures of the lower jaw contributes to the inhibition of anti-radical defense, the accumulation of peroxidation products, causing a violation of the membrane structure, and is one of the factors inhibition of osteoreparative processes. On the part of the researchers, patients with a fracture of the lower jaw who arrived early after the injury were shown the per os administration of the drug “Neoselen” in a dose of 0.5 ml of a 0.05% solution (250 μg of sodium selenite) five times after 2 days, and hospitalized in the late stages - 0.6 ml of a 0.05% solution (300 μg of sodium selenite) three times after 3 days. Patients with a

complicated course of a fracture of the lower jaw were shown: a) a purulent wound and a fracture gap to rinse every other day with 50 ml of 0.1% Unselen solution diluted with physiological saline 1: 5 for 10 days; b) to be taken orally by 1.0 ml of a 0.05% Neo-Selenium solution (500 μg sodium selenite), diluted in 100 ml of water, once every 3 days for 9 days. The results of studying the state of the POL - AOD system (lipid peroxidation - antioxidant protection) in the blood and saliva of patients with a fracture of the lower jaw, as well as data from a correlation analysis indicate the pathogenetic role of selenium deficiency in bone tissue regeneration and the development of inflammatory complications. The revealed patterns broadened the theoretical understanding of the activity of lipid peroxidation processes and their regulation systems in blood and saliva in individuals with a fracture of the lower jaw, as well as the dynamics of selenium content in the body during bone tissue regeneration.[3]

For the prevention of inflammatory complications of fractures of the lower jaw, various pharmacological preparations have been proposed. Among them, antibiotics play a leading role, which significantly inhibit the occurrence of purulent complications. However, the emergence of antibiotic-resistant strains of microflora, an increase in the frequency of allergic reactions, the negative effect on the immune system when using antibacterial drugs makes their use very problematic. Both drugs and physical methods used to stimulate osteoreparation are not always effective (II Dynin, 1989; MV Kozlova, 1992; SM. Kaluzhskaya, 1993; NL Erokina, 1998). In this regard, the search for new etiologically and pathogenetically substantiated effective methods of treating open fractures of the lower jaw and preventing post-traumatic inflammatory complications is relevant. One of these methods is ozone therapy, the positive effect of which, marked with a wide range of both surgical and therapeutic diseases.[7]

A prerequisite for the use of ozone for therapeutic purposes is its physicochemical and biological properties that determine the bactericidal, detoxification, anti-inflammatory, antihypoxic, immunocorrective effects; lack of teratogenic and carcinogenic properties. Ozone therapy is characterized by ease of use, good tolerance, high efficacy, and virtually no side effects (K.N. Kontorshchikova, 1991, 1992; S.A. Kotov, 1996; O.V. Maslennikov et al., 1999).

The use of ozone therapy by Russian scientists in the treatment of patients with fractures of the lower jaw allows us to conclude about a milder course of the post-traumatic period,

significantly faster relief of clinical symptoms than with traditional treatment. Subjectively, almost all patients noted improvement after one session of intravenous ozone therapy. A day later, these patients passed weakness and pain in the area of the fracture of the lower jaw. In the main group, on the 2-3rd day of treatment, reactive hyperemia of the oral mucosa decreased, pathological discharge from the wound in the fracture zone stopped. Patients showed a more rapid relief of post-traumatic edema when using ozone therapy on 5.54 ± 0.35 days, while in the comparison group by 9.04 ± 0.39 ($p < 0.001$). Under the influence of oxidative therapy, there was a gradual normalization of microcirculation in the injury zone. Unlike traditional treatment, ozone therapy contributed to a more rapid improvement in peripheral blood supply by eliminating arterioles spasm and facilitating venous outflow, and opening non-functioning capillaries.

The shape of the rheographic curve was restored, the amplitude of the rheogram increased. After a course of ozone therapy, the rheographic index increased to 0.92 + 0.07 ohms. Against the background of traditional treatment, this dynamics of the rheographic index was not noted (0.62 ± 0.05 Ohm). The restoration of hemodynamics in the zone of fracture of the lower jaw under the influence of ozone therapy is explained by the elimination of edema and the inclusion of a reserve vascular bed in the bloodstream. The use of ozone therapy in patients of the main group made it possible to reduce the number of purulent-inflammatory complications to 1.1%, while in the comparison group (traditional treatment) their number was 4.3% of the total number of patients. The revealed positive effect of ozone therapy led to a reduction in the period of temporary disability. So, in the conservative treatment of mandibular fractures, the period of disability in the main group was 24.87 ± 0.25 days for a unilateral mandibular fracture, 27.40 ± 0.20 days for a bilateral fracture, and 28.36 + in the comparison group, respectively 0.34 and 32.16 ± 0.47 days ($p < 0.001$).

Thus, the proposed technique allows you to achieve a powerful anti-inflammatory effect without the appointment of antibacterial agents.The inclusion of low concentrations of ozone allows you to adjust the LPO process, as it activates AOS protection without causing a disorganization of the prooxidant-antioxidant system. Therefore, ozone therapy is the most preferred treatment for patients with open fractures of the lower jaw.[7]

In recent years, for the treatment and prevention of inflammatory complications of a lower jaw injury, local administration of antibiotics, dialysis of purulent wounds, separation of a bone wound with an oral cavity using medical dressings, sealing with glue “Tsiakrim” and

others are used. The modern dressing is “Coletex” - napkins with a group of antiseptics (metronidazole, dimexide, mexidol), which have the ability to stabilize and modulate their own multicomponent antioxidant and protective systems of the body [Late A.Yu. et al., 2000; Nikitin A.A. et al., 2002, 2003]. At the same time, some issues of the optimal use of modern dressings, estimates of the effectiveness of their use remain not fully clarified. As a result of scientific research conducted by Ivanyuta I.V. it was found that in patients with fractures of the lower jaw, violations of the cell link of nonspecific resistance, characteristic of a state of moderate stress, were noted: an increase in the number of leukocytes, a change in the morphological structure (a decrease in the number of inert forms to 16.8%, an increase in active and degenerative to 64.1 and 19.1%, respectively), increased functional activity and decreased reserve capacity of phagocytic cells. Morphometric signs of these changes are the intrapopulation rearrangement of neutrophilic granulocytes (a decrease in the asymmetry index by 2 or more times), a significant increase in the average values of diameter, perimeter, area, a decrease in the phase height and volume of cells.

In this regard, the researcher included modern physicochemical methods (laser radiation and Coletexmexidol wipes) in the complex treatment of fractures of the lower jaw, which accelerated the normalization of the morphofunctional state of neutrophils (stabilization of metric parameters and morphological composition of cells), contributed to the positive dynamics of the clinical picture, reduction duration of hospital stay (1.8 bed days), a decrease in the number of complications (2 times).Contraindications to the use of the Coletexphotophoresis method are individual intolerance to the drug (mexidol), traumatic injuries in the lower jaw at the stage of abscess formation.

Monitoring of indicators of computer morphometry of the circulating pool of neutrophils made it possible to identify early signs of the development of inflammatory complications and to quickly monitor changes in the response of neutrophilic granulocytes (from a state of stress (from a state of stress or decompensation to a state of normal) during various types of postoperative treatment to assess the adequacy and effectiveness of treatment events.[8]

It is known that vitamins stimulate nonspecific protective reactions of the body, actively affecting the immune system, catalyzing and regulating biochemical processes. At the same time, in modern medicine, vitamins in multivitamin complexes in the treatment of diseases are used empirically without taking into account the synergy of their action.[10,11]

Given the above-described properties of vitamins, Russian researchers in the complex treatment of acute odontogenic purulent-inflammatory diseases and infectious-inflammatory complications of lower jaw fractures included the Vinibis multivitamin complex. As a result of studies of two groups of patients, it was found that due to the normalization of calcium and silicon concentrations in the oral fluid, a decrease in the Ca / Si ratio to control values was observed in the early stages (7th day) and amounted to 138.54 ± 12.23 (p> 0.05). This indicates an early relief of the resorptive process in the area of primary bone damage. In the dynamics of recovery of patients with chronic traumatic osteomyelitis complicated by phlegmon, the high Ca / Si ratio compared to the control remained up to 10-14 days and amounted to 399.48 ± 98.71 (p <0.05). These changes, as on the 1st day of hospitalization, were the result of a high concentration of calcium - 79.45 ± 7.33 mg / l (p <0.01 compared to the control). At the same time, the silicon content in the treatment dynamics increased, approaching the control values - up to 0.3091 ± 0.0774 mg / l (p> 0.05).

The researchers concluded that the drug “Vinibis” retains a therapeutic effect on the site of inflammation in acute odontogenic purulent-inflammatory diseases and infectious-inflammatory complications of traumatic damage to the lower jaw in doses less than prophylactic, which means that, in addition to the immunocorrective effect on the outbreak, it possesses properties characteristic of antioxidants.The differentiated purpose of the drug, taking into account its antioxidant effect, predicted by the value of the coefficient of synergism of vitamins greater than 1.14, allows you to increase the effectiveness of the complex treatment of purulent odontogenic diseases and inflammatory complications of fractures of the lower jaw.[12]

From literary sources it is known that patients with fractures of the lower jaw have a hidden course of DIC, due to disturbances in platelet, coagulation units of the hemostatic system, fibrinolysis, antithrombogenic activity of the vascular wall is reduced.In patients with a complicated course of fractures of the lower jaw, these changes are significantly more pronounced than in patients with uncomplicated healing of the fracture and chronic traumatic osteomyelitis. Rogatina T.V. studied the role of microcirculatory and coagulation unitshemostatic system and rheological properties of blood in violation of microcirculation in patients with fractures of the lower jaw and their inflammatory complications. As a result of her research, it was found that violations of the rheological properties of blood (increase in blood viscosity, red blood cell aggregation ability and decrease in erythrocyte deformability)

are most pronounced in patients with fractures of lower jawcomplicated by acute inflammatory phenomena. In turn, each study group of patients was divided into two subgroups: those who received and did not receive the Traumeel C homeopathic preparation (the drug from Baden-Baden; was used as a solution, intramuscularly, 2.2 ml every other day).

The use of the drug Traumel C in the treatment of patients with uncomplicated lower jaw fractures contributed to the restoration of the anticoagulant activity of the vascular wall, the activity of antithrombin III, blood viscosity, aggregation and deformability of red blood cells, normalizes the coagulation link of hemostasis, and also allows to reduce the time of treatment of patients,the frequency of transition of acute inflammatory phenomena into a chronic form.[13]

Russian researcher Yuan I. carried out research work on the use of gentle immobilization of bone fragments with the installation of Conmet, orthodontic mini-implants in the spongy layer of the jaw, which were used as a support for intermaxillary suspension. As a result of the studies, it was revealed that the sparing immobilization technique allows achieving good results in the functional rehabilitation of patients, while reducing the risk of infectious and inflammatory complications compared to the fixation method using Tigerstedt tooth splints and osteosynthesis.

With the method of gentle immobilization of hygiene disorders, inflammatory changes in periodontal tissues and microbial contamination of tooth surfaces are less pronounced than with the alternative fixation method using Tigerstedt tooth splints. Use by patients with fractures of the lower jaw with a sparing method of immobilization of toothpaste anti-flying action "R.O.C.S. for adults "and remineralizing gel" R.O.C.S. Medical Minerals ”helps to increase oral hygiene, reduce the severity of inflammation of the mucosa, lesser microbial contamination of the tooth surface and the most rapid restoration of lysozyme activity and IgG level, which is associated with the anti-adhesive and anti-inflammatory properties of xylitol and bromelain.[14]

CONCLUSIONS

Based on the literature, we can state the fact that the treatment of victims with a fracture of the lower jaw is still unresolved. An analysis of the scientific literature demonstrates the increased attention of specialists to the immunological aspects of maxillofacial lesions. The

features of changes in various factors of immunity in the post-traumatic period are actively studied, a variety of methods for their diagnosis and immunocorrection are offered. However, the information provided by the authors regarding the criteria for assessing the severity of immune disorders in patients with fractures of the lower jaw and the tactics of their treatment with the development of infectious complications are quite fragmented and contradictory. All of the above indicates the prospect of an in-depth study of the functioning of resistance mechanisms in fractures of the lower jaw and the need to improve the principles of pathogenetic methods of treatment and rehabilitation of these patients.

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