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# Causes and Therapy of Inflammatory Processes in the Maxillofacial Region with Antibiotics from the Penicillin Group

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**Abstract:** Currently, inflammatory processes activate various systems in the body. This article reveals the etiology and pathogenesis of odontogenic inflammatory diseases of the maxillofacial region. Special attention is paid to the aggressive course of the inflammatory process with the defeat of deep cellular spaces, accompanied by pronounced endogenous intoxication. The author analyzes the importance of the use of antibiotics from the group of penicillins in the treatment of inflammatory processes of the maxillofacial region.

**Keywords:** Purulent-inflammatory diseases, diagnostics, micro-organism, antibiotics, clinical observations.

## INTRODUCTION

Odontogenic inflammatory diseases of the maxillofacial region account for 85 to 95% of all inflammatory processes, and they play a significant role in surgical dentistry. The most common conditions that cause this are acute and chronic periodontitis, exacerbation of chronic periodontitis, acute purulent periostitis of the jaw, acute osteomyelitis of the jaw, abscess, phlegmon, and lymphadenitis. [1] These diseases are characterized by a wide spread and serious socio-economic harm. [2]

The research indicates that 3-4% of general surgery patients with purulent infection and 50–70% of all patients receiving treatment in maxillofacial surgery departments have acute purulent-inflammatory processes of the face and neck.[3] Phlegmon is a grave and exceedingly hazardous illness affecting the craniofacial region. The degree of bodily intoxication dictates the severity of the illness involving a spilling inflammatory process. Sharp pain during the inflammatory infiltrate's development is determined by the maxillofacial area's well-expressed innervation. The proximity of critical formations and the region's unique anatomical and topographical characteristics, which facilitate the inflammatory process's dissemination to nearby body areas, make the maxillofacial region susceptible to phlegmon attack.[4,5]

Odontogenic inflammatory diseases of the maxillofacial region and neck arise from the introduction of an infectious agent via the periodontal pocket into the periapical tissues (retrograde pathway) or through the root canal of the tooth affected by caries and its complications (intra-canalicular pathway of infection).[6] It was long believed that the predominant microbiological landscape in odontogenic infections was represented by monocultures (Streptococcus, Staphylococcus), or by alliances of gram-negative rods, diplococci, and streptococci.[7] Other microbial associations were discovered and confirmed, and the function of gram-negative opportunistic flora and anaerobes was established as a result of the development of techniques for detecting different microorganisms and the use of contemporary diagnostic methods [14,17].

The identification of pure cultures of microorganisms isolated from the pathogenic focus has served as the foundation for the etiology of infectious disorders, including infectious and inflammatory processes of the craniofacial area and neck.[12,14] Although many aspects of the physiology of microorganisms have been elucidated by this conventional method of producing bacteria, pure culture growing in a suspended condition is incredibly unusual in nature.[8] Presently, the majority of microbiologists agree that most bacteria in both naturally occurring and purposefully generated settings reside as structured colonies attached to surfaces called biofilms.[9]

A biofilm is a type of microbial community that is defined by cells that are bonded to surfaces or to one another, encased in a matrix of extracellular polymer substances that they have synthesized, and exhibit a change in phenotype, which is manifested in different growth parameter variations and gene expression patterns.[10] Numerous acute and persistent bacterial illnesses in humans have been linked to microbial biofilms as an etiological component.[11,16]

The plan of the observe was to improve the complex treatment of patients with acute-odontogenic, purulent-inflammatory diseases of the maxillofacial region.

## MATERIALS AND METHODS

During 2020 - 2022, in the Department of maxillofacial surgery of the Bukhara regional multidisciplinary medical center, we examined 35 patients aged from 17 to 45 years who were under inpatient treatment for acute purulent inflammatory diseases, including 20 men and 15 women. When all patients were admitted to the hospital, a detailed clinical examination was supplemented with immunological and x-ray examination, if the odontogenic etiology of the disease was assumed. Orthopantomogram, survey radiograph in lateral and direct projections, panoramic or sighting intraoral radiograph, CT studies were performed.

## RESULTS AND DISCUSSION.

In the fields of surgical dentistry and maxillofacial surgery, one of the most pressing issues is how to better diagnose and treat inflammatory illnesses of the maxillofacial region. The etiology of purulent-inflammatory disorders involves infectious-inflammatory processes, meaning that bacteria are the source of development. As a result, treating patients with purulent-inflammatory processes often involves a series of actions meant to impact the patient's body as well as infections.[3,4,5]

E. U. Makhkamov and M. I. Azimov (1987) identified the following as the causes of the rise in patients and complications: delayed access to care, medical errors during the pre-hospital phase of treatment, established medication prescribing stereotypes, delayed diagnosis of diseases and developed complications, and as a result, inappropriate treatment approaches. Despite the use of various methods of therapy for purulent-inflammatory diseases of the maxillofacial region, the surgical method of treatment remains the main one.

A variety of surgical procedures and conservative treatments are used to treat purulent-inflammatory conditions. For patients with purulent-inflammatory illnesses of the maxillofacial region, surgery is the primary multicomponent therapeutic approach. The traditional purulent surgical principle—which calls for the obligatory opening of the purulent focus—remains relevant today. The anatomical and topographic localization of the abscess is considered while selecting the method of operational access to the purulent center. First and foremost, treating phlegmon involves making large, sufficiently deep incisions that allow pus to freely flow out, relieve pressure in infiltrated tissues, remove necrotic tissues as soon as possible, suppress microflora, and speed up the regeneration process.[6,7,8]

The number of complications from acute odontogenic purulent-inflammatory diseases, including sepsis, meningitis, meningoencephalitis, mediastinitis, brain abscess, facial vein thrombophlebitis, cavernous sinus thrombosis, bacterial shock, etc., has increased recently,

according to our clinical observations. The development of antibiotic-resistant and antibiotic-dependent strains of microorganisms, changes in the virulence of microflora, and a decrease in the body's resistance all contribute to the occurrence of the aforementioned complications. Additionally, the use of antibacterial therapy for acute odontogenic purulentinflammatory diseases of MFR exacerbates the condition and makes patient treatment more challenging.

As for the currently used diagnostic methods, in some cases, errors may occur in making the correct diagnosis of a particular pathology. This in turn leads to the choice of inadequate methods of treatment of patients, which refers to microbiological and laboratory methods of diagnosis.

It is necessary to look for contemporary techniques for both their diagnosis and appropriate treatment, as evidenced by the aforementioned regularities in the clinical picture of acute odontogenic purulentinflammatory processes of the maxillofacial area and their clinical laboratory features. The rapid retrograde spread of purulent infection is caused by topographic and anatomical aspects of the maxillofacial region, which heightens the risk of life-threatening consequences. The issue with the craniofacial region and neck thus forces experts in this field to develop novel approaches to diagnosis and therapy that impact several pathways in the etiology of inflammatory processes and offer a prognosis for the disease's progression.

Antibacterial medications with the ability to prevent the fast replication and pathogenic characteristics of microorganisms and their relationships must be prescribed to patients with purulent-inflammatory illnesses and purulent-septic complications of the maxillofacial region. You can take the following actions to lessen the onset of purulent-inflammatory and purulent-septic diseases: you can alter the microflora by using bacteriostatic and bactericidal medications, or you can boost the patient's immune system.

Conversely, there are a lot of drawbacks to the current, widespread usage of antibiotics. This could be due to some aggressive microbes becoming more resistant to antibacterial medications. Furthermore, the appearance of novel resistant microbe strains is seen. Because germs are becoming more resistant to antibacterial agents, antibacterial agents frequently have no effect. This could lead to an increase in the opportunistic microbes' etiological role. Experience gained over many years has demonstrated that the use of antibiotics may have a role in the development of allergic responses, dysbacteriosis, intoxication, and other problems. Antibacterial medication therapy is now regarded as a crucial component of the multifaceted management of acute odontogenic inflammatory disorders associated with MFR.

The range of an antibacterial drug's antimicrobial action should be considered before prescribing it to a patient. The dosage of the antibiotic is determined individually based on factors such as age, process severity, microflora sensitivity, and the condition of renal and liver excretory functions, as well as the patients' tolerance to the medication.

When prescribing an antibacterial medicine to a patient, it is important to consider the range of its antimicrobial effect. The antibiotic dose is determined individually based on the patient's age, severity of the process, microflora sensitivity, kidney and liver excretory function, and medication tolerance.

Antibiotic therapy should often begin with the administration of "shock" dosages of the medication. Using high dosages of antibiotics early in treatment can result in acute inflammatory illnesses due to the rapid death of cells caused by microbial endotoxins. The second disadvantage is the development of allergic reactions, stacking of toxic consequences, dysbacteriosis, and candidiasis.

On the contrary, conducting small doses of antibacterial drugs results in insufficient therapeutic effect and disease relapses, as well as leading to the development of drug resistance in pathogenic bacteria through the survival of less sensitive individuals, followed by their selection and proliferation.

Special attention should be paid to those antibiotics that have a more effective effect on the bone tissue. Lincomycin hydrochloride is prescribed for 0.6 g/day, and for severe course of the process-every 8 hours. After receiving the data of the antibioticogram and determining the pathogen, the appointment of drugs is carried out taking into account the sensitivity of the microflora and the compatibility of paired combinations of antibacterial drugs.

Antibiotic medication should be administered for a minimum of 7-8 days. Antibiotics should be changed every ten days when used for an extended period of time, as directed by the antibiotic chart, to prevent germs from becoming resistant to the treatment and to minimize side effects.

The drug should be changed if other kinds of issues start to appear.

All patients should have a detailed blood test every week, and it is necessary to pay attention to changes in the number of white blood cells and certain types of white blood cells. With prolonged use of broad-spectrum antibiotics, antifungal drugs should also be prescribed (levorin 500,000 UNITS 2-4 times a day; nystatin 500,000 UNITS 3-4 times a day; griseofulvin 0.5 g. 4 Rza per day).

Sulfonamides and nitrofuran preparations should be used in conjunction with antibacterial agents. Sulfonamides are used because they inactivate betalactamase, which prevents microbial infections from becoming resistant to penicillin. Certain bacteroids generate beta-lactamase, which can lower the concentration of suitable antibiotics in local tissues. This helps shield the microorganisms linked to the bacteroids in the inflammatory area, even though these bacteria are sensitive to prescription medications when they are in the form of pure cultures.

In the complex treatment of acute odontogenic purulent - inflammatory diseases of the maxillofacial region, long - acting sulfonamides, such as sulfadimetoxin, sulfalen, and sulfapyridazine, are widely used.

It should be borne in mind that the level of concentration of antibiotics in the blood of elderly and senile people, especially with more or less prolonged use, is higher than in young people, which can be explained by the delayed release of these substances by the kidneys. Such antibacterial drugs as aminoglycosides, macrolides, tetracyclines and cephalosporins can be prescribed to patients only in the absence of renal failure. In geriatric practice, attention is drawn to the possibility of ototoxic effects of certain antibiotics-streptomycin, gentamicin, neomycin, etc. the function of the auditory nerves, as well as their ability to cause the development of candidiasis, atrophic glossitis and vitamin b deficiency. Therefore, when treating elderly and senile people with antibacterial drugs, it is recommended to simultaneously prescribe antifungal drugs and multivitamins.

As for the issues related to the treatment of acute purulent inflammatory diseases of the maxillofacial region, in modern conditions of "pharmacological oversaturation" of the body, reducing the sensitivity of microflora to antibiotics, suppression of immune protection by environmental factors, allergization of the body, insufficiently sparing in some cases, surgical intervention techniques, there is a low efficiency of generally accepted methods. All the above clearly indicates that the problem of treatment of acute purulent inflammatory diseases of the maxillofacial region in patients is urgent and requires the development and implementation of new technologies.

Thus, the complexity of the pathogenesis of this pathology - the presence of a microbial factor, inhibition of immunological status, intoxication, microcirculatory disorders, General and local hypoxia, etc. cause a variety of treatment methods.

Summing up all the above, we can state that the main direction in the complex treatment of purulent- inflammatory processes is devoted to the use of antibacterial and antitoxic drugs with adequate surgical intervention

Despite the introduction of modern diagnostic methods, the problem of providing timely specialized care to patients with purulent and inflammatory diseases of the maxillofacial region remains relevant to this day. The medicinal products used should have a high therapeutic effect and have as few contraindications to their use as possible. We found it appropriate to approach the treatment of the above diseases using in their comprehensive treatment of antibacterial drug Climax.

This drug is available in tablets of 375 Climax, Climax 625, Climax 1000 coated. Drug Climax consists of a broad-spectrum antibiotic amoxicillin and clavulanic acid. Amoxicillin from the group of semisynthetic penicillins, which inhibits transpeptidase, disrupts the synthesis of peptidoglycan during division and growth, and causes lysis of microorganisms. Clavulanic acid is a product of fermentation of Streptomyces clavuligerus and has a higher affinity for p - lactamases than amoxicillin administered simultaneously. Forming a stable inactivated complex with them, it prevents the enzymatic destruction of amoxicillin and provides a guaranteed possibility of its antibacterial action. Also, clavulanic acid, similar in structure to a p-lactam antibiotic, has a weak intrinsic antibacterial activity. Klamox is active against the following microorganisms:

1. gram-Positive aerobes: S. Pneumonia, S. Piogenes, S. Viridans, S. Bovis, S. Aureus, S. Epidermidis, Listeria spp, Enterococcus spp.
2. gram-Negative aerobes: H. Influenzae, Maroxella catarralis, E. coli, Proteus spp, Klebsiella spp, N. Gonorrhoeae, N. Meningittidis, Pasteurela multocida.
3. Anaerobes: Peptococcus spp., Peptostreptococcus spp., Clostridium spp., Bacteroides spp. Climax well absorbed through the gastrointestinal tract. The diet does not affect the degree of absorption of the drug. The peak concentration of the drug in the blood plasma occurs after about 1 hour.

**CONCLUSIONS.**

The goal of complex treatment is to reduce intoxication, restore the disturbed balance between the body and the environment.

Since the main etiological factor of purulent- inflammatory processes are microorganisms, the main importance is the impact on the pathogenic microflora - the use of antibacterial drugs, both a wide spectrum of action, and taking into account the sensitivity of the flora. Analysis of the results of the study showed that the use of complex therapy with the use of the antibacterial drug "Klamox" in the complex of therapeutic measures in patients with acute odontogenic inflammatory diseases of the maxillofacial region leads to recovery, significantly reducing the time of hospitalization.

When using the method of complex combination antibacterial therapy in treatment of acute odontogenic inflammatory diseases of maxillofacial region it is necessary to consider the nature and etiological factor of occurrence of the above pathological conditions.

**REFERENCES**


1. Abaev Yu. K. Modern features of surgical infection // Bulletin of surgery, 2005; 3: 107-111.
2. Kuldasheva V. B. Application of modern means in the rehabilitation of patients with inflammatory processes of the maxillofacial region / / Dissertation for the academic degree of master, 2015.
3. Vladychenkova T. N., Zabelin A. S., Loktev N. I. Inflammatory diseases of the maxillofacial region and neck: Educational and methodological guide for students / Under the editorship of A. G. Shargorodsky. - Smolensk, 1986; 23.
4. Dmitrieva N. A., Khazanova V. V. Features of pathogens of various inflammatory processes of the maxillofacial region // Dentistry, 1987; 55.

5. Ksembaev S. S. Acute odontogenic inflammatory diseases of the jaws. Diagnostics and treatment of angio-and osteogenic disorders/ S. S. Ksembaev, I. G. Yamashev. - M.: Medpress-inform, 2006; 128.
6. Durnovo E. A. Inflammatory diseases of the maxillofacial region: diagnostics and treatment with regard to immunoreactivity of the body/ E. A. Durnovo-N. Novgorod: Nizhny Novgorod state Academy publishing house, 007; 196.
7. Beloborodova N. V. the Role of microbial communities or biofilms in cardiac surgery /N. V. Beloborodova, I. T. Bayramov // Antibiotics and chemotherapy, 2008; 11: 44-59.
8. Davey M. E. Microbial biofilms: from ecology to molecular genetics / M. E. Davey, G. A. O'toole/ / Microbiology and Molecular Biology Reviews, Dec 2000; 64(4): 847-867
9. Donlan R. M. Biofilms: Survival Mechanisms of clinically Relevant Microorganisms / R. M. Donlan, J. W. Costerton // Clinical Microbiology Reviews, 2002; 15(2): 167-193.
10. Bacterials biofilms: a common cause of persistent infections / J. W. Costerton [et al.] / / Science, 1999; 284: 1318-1322.
11. Geographic variations in garenoxacin (BMS 284756) activity tested against pathogens associated with skin and soft tissue infections: report from the SENTRY Antimicrobial Surveillance Program (2000) / J.T. Kibry [et al.]// Diagn. Microbiol. Infect. Dis, 2002; 43(4): P. 303-309.
12. Sidorenko S. V. the Role of bacterial biofilms in human pathology / S. V. Sidorenko // Infection in surgery, 2004; 2(3): 16-20.
13. Ability of pathogens of phlegmon of soft tissues to form biofilms. / Fadeev C. B [et al.] / Infection in surgery, 2010; 7(2): 41-44.
14. DeKievit T. R. Quorum sensing in Pseudomonas aeruginosa biofilms /T.R. DeKievit // Environ. Microbiol, 2008; 11: 279-288.
15. Kruchinsky V. G., Filippenko V. I. Odontogenic maxillary sinusitis. - Minsk:, 1991. - 185s.
16. Makhkamov E. U., Karshiev H. Treatment of sepsis in surgical dental patients. // Wounds and wound suppurative oral and maxillofacial surgery. conf., 6- Andijan,-1995 with 31.
17. Odontogenic anaerobic gas gangrene of the maxillofacial region. G. P. Ruzin, I. A. Grischuk. et al./Stomatology-1991, no. 3 with 36-37.