

Features Of The Use Of Antibiotics In The Treatment Of Facial-Jaw Surgical Diseases (Literature Review)

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Abstract. For many years, the most difficult and urgent problem of surgical dentistry and maxillofacial surgery has been the treatment and prevention of pyoinflammatory diseases of the maxillofacial region. Odontogenic infectious and inflammatory diseases are the most common reason for patients seeking dental surgery. Of the acute odontogenic inflammatory processes for which children are hospitalized in a hospital, the most often stated are: periostitis of the jaw, abscesses, phlegmon.

Keywords. Odontogenic infections, streptococcus, purulent lesions, microorganism, Antibiotic.

Introduction

Despite the development of new methods of treating patients with inflammatory diseases, their number tends to increase [3].

Odontogenic infections are usually caused by microorganisms that are constantly present in the oral cavity. Usually this is a mixed microflora, including more than 3-5 microorganisms. Facultative bacteria are mainly green streptococci (in particular *Streptococcus mutans*, *Streptococcus milleri*), as well as non-spore-forming anaerobes (*Peptostreptococcus* spp., *Fusobacterium* spp., *Actinomyces* spp.).

In case of periodontal infection, five main pathogens are most often isolated: *Porphyromonas gingivalis*, *Prevotella intermedia*, *Eikenella corrodens*, *Fusobacterium nucleatum*, *Actinobacillus actinomyces comitans*, less often *Capnocytophaga* spp. [15]. Depending on the location and severity of the infection, the patient's age and concomitant pathology, changes in the microbial spectrum of pathogens are possible. Thus, severe purulent lesions are associated with facultative gram-negative flora (*Enterobacteriaceae* spp.) And *Staphylococcus aureus*. *Enterobacteriaceae* spp. Also predominate in elderly patients hospitalized in the hospital [11].

According to I.I. Oleinik (1992), from 1 to 6 anaerobes and 1-2 aerobes (streptococcus and staphylococcus), on average, participate in the infectious process during the development of inflammatory diseases of JIP and the oral cavity.

'Research by V.N. Tsareva, R.V. Ushakova (1996) found that *Staphylococcus* spp. is sown in

odontogenic inflammatory diseases. (15%), Streptococcus spp. (6%) and obligate anaerobic bacteria (79%). Anaerobes are represented by gram-positive microorganisms - Bacteroides spp., Fusobacterium spp., Gram-positive cocci. Resident flora is shown in 86%, and only in 1% - pathogenic strains.

Clinical and morphological studies carried out by S.V. Tarasenko (2002) showed that the microflora of the purulent focus of patients with odontogenic phlegmons is represented by 85-96% obligate anaerobes in association with aerobes. Anaerobes were found in 28-100% of crops, and a mixed anaerobic-aerobic flora of purulent foci was observed in 52-68% of clinical samples. Anaerobic - aerobic associations most often consisted of 3-4 species.

Treatment of patients with purulent-inflammatory diseases of the maxillofacial region is carried out in a complex manner: surgical intervention, local treatment of purulent wounds, antibiotic therapy, physiotherapy, and, if indicated, detoxification and immunocorrective therapy.

The tactics of surgical treatment are currently well defined. It includes the opening of a purulent-inflammatory focus by layer-by-layer dissection of tissues above it, as well as drainage of the surgical wound in order to create conditions for the evacuation of purulent exudate containing causative agents of the disease, their metabolic products and tissue decay [10, 14].

Antibiotics play a major role in drug therapy of patients with purulent-inflammatory diseases of the maxillofacial region. When working with antibacterial drugs, it is necessary to take into account their main qualities:

- development of the effect within the cell of the microorganism;
- the presence of certain congenital and the formation of acquired drug resistance;
- prospective decrease in the antimicrobial effect in subsequent generations of patients [2].

Recently, there has been a tendency towards an increase in the resistance of certain pathogens of community-acquired and nosocomial infections to certain antibiotics [8]. This is, first of all, the spread of methicillin-resistant staphylococci (MRSA), penicillin-resistant streptococci (PRSA). At the same time, the high sensitivity of Streptococcus pyogenes to penicillins and cephalosporins was preserved, but an increase in microflora resistance to macrolides (up to 30%) and tetracyclines (up to 60%) was observed [11].

Antibacterial therapy is often carried out irrationally, without bacteriological control [1], which leads to the development of microflora resistance, allergization of the body, and disruption of intestinal microbiocenosis [2].

According to MedicalAdvertisingNews (USA), dentists daily prescribe from 2 to 10 antibiotics, especially often antibiotics are used in patients with complaints of pain and swelling of the soft tissues of the face [12]. There are practically no data confirming the advisability of antibiotic therapy for many manipulations in dentistry. Moreover, the results of clinical studies indicate the undesirability of using

antibiotics in some situations.

In the clinic of surgical dentistry, antibiotics are prescribed for purulent-inflammatory diseases of the maxillofacial region and for the purpose of prophylaxis (for injuries of soft tissues and bones of the face, after implantation, reconstructive operations, systemic prophylaxis with artificial heart valves) [10].

Currently, there are methods of express diagnostics for assessing the sensitivity of pathogenic microflora to antimicrobial drugs, Gram staining is possible and available to clinicians, and assessment of the organoleptic properties of wound exudate. When thick creamy pus is obtained from the focus, the presumptive causative agent is staphylococcal flora; upon receipt of liquid, fetid pus - a microbial association with a predominance of gram-negative bacillary flora. If pus is not obtained from the wound, but a turbid-reddish fluid is released, then an anaerobic microflora can be assumed. Also, knowledge of the most common causative agents of inflammatory diseases of the maxillofacial region [17], the topographic anatomy of the face and neck, information on the prevalence of the process, the general condition of the patient, the characteristics of the allergic history, the age of the patient [11] is of great help in planning empirical therapy. When treating a patient in a hospital setting, it is advisable to choose a drug that has forms for parenteral and oral administration in order to conduct stepwise therapy. Step-by-step therapy involves a two-stage use of antibacterial drugs: first, parenteral administration of an antibiotic, and when the condition improves (usually on the 3-4th day), switch to oral administration of the same drug or a drug with a similar spectrum of activity [12].

The tendency to reduce the patient's hospital stay due to an increase in the post-hospital period leads to the replacement of an injectable form of an antibiotic with an oral one during further treatment in a polyclinic. To date, a number of controlled clinical trials have been carried out, which have convincingly confirmed the clinical efficacy of stepwise therapy. Sequential therapy provides clinical and economic benefits to both the patient and the hospital [16].

When planning treatment in a dental clinic, it is advisable to prescribe oral antibiotics with high bioavailability, with a long half-life, with minimal impact on the intestinal microflora [17].

A.I. Yaremenko indicates that the reasons for the ineffectiveness of antibiotic therapy are as follows:

- 1) antibiotic therapy in case of an undrained focus of purulent inflammation or in the presence of a foreign body in the wound;
- 2) the infectious process is caused by a non-bacterial pathogen (viruses, fungi);
- 3) inadequate choice of antibiotic (there is a natural resistance of the pathogen);
- 4) change in the sensitivity of the pathogen during the course of treatment;
- 5) prescribing subtherapeutic doses of the drug, violation of the method of taking the drug or the technique of administration (violation of the instructions for dilution and storage);
- 6) purulent-inflammatory processes of the maxillofacial region are a complication of the underlying disease (congenital cysts, neoplasms);

7) superinfection with hospital microflora.

At the outpatient stage, it is permissible to treat patients with the following nosological forms: acute and exacerbation of chronic periodontitis, acute periostitis, purulent-inflammatory diseases of the soft tissues of the face and neck, prophylactic use of antibiotics during surgical interventions (removal of impacted and dystopic teeth, cystectomy, tooth-preserving operations, implantation) [4].

When treating abscesses, boils, carbuncles of soft tissues of the maxillofacial region, it is necessary to prescribe cefuroxime or erythromycin [6] for phlegmon - cefuroxime, amoxicillin / clavulanate, spiramycin, levofloxacin [7], for osteomyelitis, levofloxacin dim, cefuroxime, imipenem, rifampicin, ceftriaxone [8].

If there are indications for antibiotic prophylaxis, it should be started before surgery with a single maximum dose of a suitable antibiotic and finished after the completion of surgery [14].

Antibiotics are widely used as adjunctive therapy to prevent infections in the treatment of facial fractures. Recent data show that antibiotics are useful during initial surgical debridement, with their withdrawal after reposition and fixation of bone fragments. Continuation of antibiotic therapy after surgery does not reduce the overall incidence of infectious complications [3].

It is generally accepted that manipulations in the oral cavity can lead to hematogenous spread of microorganisms with the development of distant sites of infection [8]. Questions - when and under what conditions antibiotic prophylaxis is needed - remain controversial [9].

Conditions requiring antibiotic prophylaxis of infective endocarditis:

- artificial heart valves;
- a history of infective endocarditis;
- congenital or acquired impaired condition of the heart valves;
- mitral valve prolapse with regurgitation.

Patients with immunosuppressive conditions and bone marrow transplants can be considered as a category of persons requiring antibiotic prophylaxis for oral interventions, HIV-infected and AIDS patients do not belong to the higher risk category and do not require antibiotic prophylaxis in dental treatment [17].

V.N. Tsarev, R.V. Ushakov (2003) propose to carry out antibiotic prophylaxis in dental surgery and maxillofacial surgery using the following scheme and drugs (Table 1)

Table 1.

Operations	Examples of operations	Drugs
Operations not related to the oral cavity	Removal of tumor-like and benign tumors on the face, neck cysts.	Cyfazolin 1 g intravenously. Amgzhicilli on / clavulanate 1.2 g intravenously, in case of allergy to (1-lactams - vancomycin 1 g intravenously.
Operations related to the oral cavity (conditionally clean)	Dental implantology, sinus lifting, correction of the alveolar bone, deepening of the vestibule of the oral cavity.	Roxithromycin 150 mg 30-60 minutes before surgery. Cefazolin 1-2 g 30 minutes before surgery intravenously. Lincomycin 0.5 g 30 minutes before the operation
Operations related to the oral cavity (contaminated)	Operation on the maxillary sinus in case of parasitic hyperplastic sinusitis, osteosynthesis in case of jaw fracture within the dentition, root apex resection and cystectomy.	Ampicillin / clavulanate 30 minutes before surgery 1.2 g intravenously, after surgery 625 mg 3 times a day for 3 days. Lincomycin 0.5 g 30 minutes before the operation intramuscularly, after the operation 1 g 2 times a day for 3
Operations "dirty"	Excision of the focus in case of actinomycosis, sequestration by act, operations on the maxillary sinus in case of purulent forms of sinusitis.	The same drugs as in group 3 operations, but the period of administration after the operation is 5-7 days.

When analyzing the results of the work of the department of maxillofacial surgery of the state budgetary healthcare institution "Nizhny Novgorod Regional Children's Clinical Hospital" in the period from 2013 to 2017, a greater number of cases of inflammatory diseases of the maxillofacial region in children of the age

4-6 years old. Periostitis prevailed from the total number of inflammatory processes. In this case, temporary teeth, more often molars, have always been "causal" [6].

According to statistical data, odontogenic periostitis is quite often (in 94-95% of cases) acute and only in 5-6% passes into a chronic phase. In this case, a subperiosteal abscess develops more often in males and is localized on the vestibular surface of the jaw [1].

The share of periostitis in the total number of complications of dental diseases (caries, pulpitis, gingivitis, periodontitis) in Kyrgyz children is 23.5%. The frequency of periostitis is higher in boys (26.9%) than in girls (19%), which is consistent with the data of A.N. Kushner et al. (2012), I. V. Fomenko et al. (2016) [14, 15]. The increase in the incidence of periostitis in the pediatric population of Bishkek, according to S. T. Abdyldaev (2016), is associated with the high cost of dental services, mistrust of doctors due to unsuccessful previous treatment experience, the need for multiple visits to the dentist and lack of time for parents [8]. Information by A.A.Eshiev et al. (2018), indicate that in the structure of infectious and inflammatory diseases in the Department of Maxillofacial Surgery of the Osh Interregional Joint Clinical Hospital for the period from 2014 to 2018, odontogenic osteomyelitis and jaw periostitis (14.1% and 7, 8%, respectively) [9].

According to a number of researchers, children with odontogenic infectious and inflammatory processes in the maxillofacial region are subject to urgent hospitalization due to the possibility of a rapid spread of the pathological process due to anatomical, physiological and topographic factors, the peculiarities of blood supply, lymph circulation, as well as the reflexogenicity of the zone, the proximity of the central nervous systems [7, 3].

Surgical intervention is carried out under general anesthesia in a specialized hospital, and in a polyclinic, local anesthesia is used. For local anesthesia it is recommended to use the following modern drugs "Ultracaine", "Ultracaine Forte", "Septanest", "Alfacaine", "Bupivacaine hydrochloride" [4]. The use of modern local anesthetics reduces the risk of developing common complications [5]. In addition, local anesthetics of the amide class are pharmacologically combined with antimicrobial drugs of the sulfanilamide series, which are widely used to treat acute inflammatory processes of the jaws [6].

When providing comprehensive specialized medical care to patients with infectious and inflammatory diseases, the success of treatment depends on the timeliness of the primary surgical treatment of the infectious and inflammatory focus and the adequacy of its drainage [6].

Surgical treatment consists in periostotomy and mandatory removal of the "causal" tooth, followed by instillation of the wound with antiseptic solutions and its drainage. All temporary teeth and roots of permanent teeth, which have lost their anatomical and functional value, are also subject to removal. In addition, with daily dressings for antiseptic treatment of purulent wounds, it is recommended to use modern antibacterial drugs: 0.01% miramistin solution, 0.05% chlorhexidine bigluconate solution, 1% dimexide solution, etonium solution, 1% alcohol solution of chlorophyllipt [3, 4].

After the operation, this contingent of patients, in addition to complex anti-inflammatory therapy and daily dressings, is prescribed bed rest, a sparing diet, rinsing the mouth with decoctions of

herbs [15].

Drug treatment includes antibacterial and detoxification therapy, hyposensitizing agents, symptomatic (pain relievers) and general strengthening (vitamins, adaptogens) therapy, which is carried out depending on the child's age, general condition and associated somatic pathology [12, 11].

In the presence of pronounced symptoms of intoxication, anti-inflammatory therapy is prescribed with the use of broad-spectrum antibiotics. In surgical dental practice, patients with acute inflammatory diseases of the bone tissue are prescribed antibacterial drugs with tropism to it [12]: antibiotics of the tetracycline series (tetracycline hydrochloride, doxycycline hydrochloride, combined drug Oletetrin, Metacyclin hydrochloride), antibiotics of the lincomycin group ("Lincomycin hydrochloride", "Clindamycin"), preparations of fusidin ("Fusidin-sodium"), "Augmentin", preparations of the group of fluoroquinolones - "Ciprofloxacin", macrolides and azalides ("Roxithromycin" and "Azithromycin ») [13, 14].

Conclusion. The development of an antibacterial algorithm, it is necessary to be confident in the possibility of therapy, is of an individual character of the patient to purchase the drug, the desire to ter, based not only on the characteristics of the possibility of taking it. In the treatment of awakeners, the course of a purulent-inflammatory patient in a hospital, the purposive process, the state of the immune system, the choice of a drug that has the shape of the patient's body is different, but also a social anam for parenteral and oral veneer. When prescribing antibacterial denia for the purpose of carrying out stepwise thermal preparations on an outpatient basis, non-therapy.

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