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EXPERIMENTAL SUBSTANTIATION OF THE BACTERICIDAL EFFECT OF SODIUM HYPOCHLORITE ON THE MICROFLORA OF A PURULENT WOUND WITH ODONTOGENIC PHLEGMONS OF THE FACE AND NECK.

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Abstract:

The purpose of the work was to study the bactericidal effect of sodium hypochlorite on pathogens of odontogenic purulent foci under the experimental conditions and the adequacy of its use in the treatment of odontogenic phlegmon of the face and neck.

Pus was collected from patients with odontogenic phlegmon. Half of the material served as a control. To the main part, a solution of sodium hypochlorite was added at various concentrations and after 5, 15 and 30 minutes, cultures were planted on dishes with nutrient medium for aerobic and anaerobic bacteria. One cup was placed in anaerostat, the other in a thermostat and incubated.

As a result of the research, it has been established that sodium hypochlorite has a bactericidal effect on the microflora from odontogenic foci of infection at a concentration of 500-700 mg / l after 5 minutes of contact. Lower concentrations require longer exposure times.

Keywords: *dental surgery, odontogenic phlegmon, sodium hypochlorite*

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INTRODUCTION:

Treatment of purulent-inflammatory diseases of the face and neck is a complex task that can be solved only if a set of measures that affect the various links of the pathogenetic process is carried out. The complexity of the pathogenesis of acute odontogenic infection, a wide range of conditioning factors, the rapid development of the disease, the continuous decrease in the effectiveness of antibiotic therapy, the progressive frequency of allergic, toxic manifestations and the possibility of developing severe complications determine the need for constant search for new methods for general and local treatment of inflammatory processes.

The centuries-old surgical practice has developed general rules for the therapy of any purulent inflammatory process - opening of the pathological focus, its adequate drainage, followed by the appointment of drug therapy to correct abnormalities in the body caused by the inflammatory process, and the creation of conditions for the purification of the wound and the reparative process [9].

An integral part of the complex therapy of inflammatory diseases of the maxillofacial area is a targeted effect on the virulent organisms. The leading role in this case belongs to broad-spectrum antibiotics, sulfonamides, nitrofurans, antimycotic drugs. Recognizing the decrease in the effectiveness of antibiotic therapy, we consider it mandatory in the system of integrated measures [2, 3].

Recently, the attention of researchers is increasingly focused on local therapy of inflammatory processes. To this end, using injection into inflamed wound of antistaphylococcal plasma, continuous washing of the wound with broad-spectrum antibiotics. Anti-inflammatory, fibrinolytic, decongestant and necrolytic properties of enzyme preparations are expressed. Increased attention to the antiseptic chlorhexidine as an effective tool for local treatment of purulent foci with microflora, resistant to antibiotics. Therefore, the search for new antiseptic drugs does not stop. The requirement of time - they must not only act on pathogens, but have a poly-directional action: accelerate the cleansing of the wound, reduce intoxication, improve local immunity. Now the arsenal of such drugs has been replenished with a drug whose active principle is sodium hypochlorite, which contains hypochromic acid in its composition. This drug is widely used in therapeutic dentistry, general surgery and other [1, 4, 5].

Like any active oxygen carrier, sodium hypochlorite solution has a pronounced bactericidal effect due to the ability to oxidize products of tissue and bacterial origin. Having a low molecular weight, it penetrates through the outer membrane of bacterial and cellular structures, violating their permeability, and hence - the possibility of overcoming antibiotic resistance and increasing the sensitivity of microflora to antibiotics [6, 8].

The bactericidal effect of sodium hypochlorite on the causative agents of odontogenic purulent foci is studied under the conditions of the experiment with the aim of substantiating its adequacy in the treatment of patients with odontogenic phlegmons of the face and neck [7].

MATERIALS AND METHODS:

For the study, pus was collected from patients (total 30 patients) with odontogenic phlegmon puncture, observing the rules of material sampling. The latter was delivered to the laboratory for 30-60 minutes, where it was used to isolate and identify pathogens of aerobic and anaerobic infections. Half of the material used was control. To the main part, a solution of sodium hypochlorite was added at a final concentration of 300 mg / l (1 series of experiments), 500 mg / l (2 series of experiments) and 700 mg / l (3 series of experiments) and after 5, 15 and 30 minutes of exposure on cups with a suitable nutrient medium for aerobic and anaerobic bacteria. One cup was placed in anaerostat and incubated under anaerobic

conditions for 7 days, the other in a thermostat at 37 ° C and incubated aerobically for the same period of time (a total of 270 studies, including 90 controlling).

RESULTS AND DISCUSSION:

As a result of experimental studies in vitro, it has been established that sodium hypochlorite has a bactericidal effect on the microflora from odontogenic foci of infection at a concentration of 500-700 mg / l after 5 minutes of contact (Table 1). Lower concentrations (300 mg / l) require more time for the bactericidal effect (15-30 minutes).

Table 1: The action of sodium hypochlorite on the reproduction of microorganisms *in vitro*

Culture identified in the control	The concentration of the microorganism suspension	The concentration of sodium hypochlorite, exposure in minutes									Controlling
		300 мг/л mg/l			500 мг/л mg/l			700 мг/л mg/l			
		5	15	30	5	15	30	5	15	30	
St. aureus	10^6	-	-	-	-	-	-	-	-	-	+
St. epidermidis	10^6	-	-	-	-	-	-	-	-	-	+
Ps. aerginosa	10^6	-	-	-	-	-	-	-	-	-	+
E. coli	10^6	-	-	-	-	-	-	-	-	-	+
Pr. vulgaris	10^6	-	-	-	-	-	-	-	-	-	+
Peptococcus	10^6	+	-	-	-	-	-	-	-	-	+
Peptostreptococcus	10^6	+	-	-	-	-	-	-	-	-	+
Bacteroides	10^6	-	-	-	-	-	-	-	-	-	+
Veilonella	10^6	-	-	-	-	-	-	-	-	-	+
Fusobacterium	10^6	+	-	-	-	-	-	-	-	-	+
Note: "-" - no growth, "+" - solid growth											

CONCLUSIONS:

Therefore, the solution of sodium hypochlorite at a concentration of from 500 to 700 mg/l can be used in clinical practice for washing festering wounds as a pathogenetic means for the impact on the microflora.

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