



Bacterial Microflora and Microflora Properties in Inflammatory Diseases of the Maxillofacial Region, Including Phlegmon

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Abstract: Odontogenic infections occur daily in dental, oral and maxillofacial surgery, and some practitioners may be unfamiliar with a wide range of other infections of various etiologies, some of which are relatively rare or even uncommon. Patients suffering in this way come to their attention either by referral from primary care providers or because patients are unsure of where to seek care for diseases manifesting in the orofacial region. Also in the inpatient setting, where most oral and maxillofacial surgeons practice, there are regular requests to consult patients who require interdisciplinary collaboration, despite the fact that their conditions mostly fall within the realm of specialties such as ENT surgery, ophthalmology, dermatology and others. Phlegmon is a diffusely spreading soft tissue infection not associated with underlying purulent foci. It includes rapidly spreading areas of oedema, erythema, and may be accompanied by lymphangitis and regional lymphadenitis.

Key words: Phlegmon, bacterial microflora, oedema, erythema, streptococci.

Introduction. Phlegmon of odontogenic origin is most commonly caused by β -haemolytic streptococci (usually group A), but can also be caused by other streptococcal species. Less frequently, *C. goldenseal* may be involved, especially in cases involving penetrating trauma. The etiological diagnosis of phlegmon is often difficult and is usually unnecessary in patients with mild signs and symptoms. Hepatitis B is now becoming an epidemic and a major sociopathic problem associated with the rise in heroin addiction, leading to an increasing number of these patients seeking medical care, requiring both urgent and planned surgical intervention, in non-communicable health-care facilities. The problems of purulent infection in dentistry are characterised by a steady increase in odontogenic and other purulent inflammatory diseases of the maxillofacial region, an increase in severe forms of these diseases with frequent complications, up to and including death, requiring large surgical interventions and intensive therapy. The composition and properties of the microflora of purulent-septic infections of the maxillofacial region are well known. There are reports of a constant change in the characteristics of the pathogens of these diseases over the past decades. Before the use of

antibiotics, the main causative agent of purulent inflammatory diseases and postoperative complications was a-haemolytic Streptococcus. The use of antibiotics, to which Streptococcus is highly sensitive and to which it acquires almost no resistance, has led to a reduction in its etiological role as a causative agent of surgical infection. Staphylococcus showed a comparatively greater adaptability to the action of antibiotics, whose biological rearrangement determined the formation of antibiotic-resistant strains. By the end of the 1980s, Staphylococcus had taken a dominant position in the structure of the causative agents of purulent surgical infections. It was isolated in monocultures and associations in 60-70% of cases. At present, an increasing proportion in the etiology of purulent infection is attained by opportunistic pathogenic microflora. This group of pathogens has become highly pathogenic under the conditions of using antibiotics, to which it shows a pronounced natural and acquired resistance.

Objective: to study the composition of the microflora of purulent wounds of the maxillofacial region depending on the type of inflammation from 2019 to 2022.

Material and methods of research: The material for the study was the contents of purulent wounds. Samples were taken in 03% sugar broth for analysis. The cultures were incubated in aerobic conditions at 37 °C for 24 h, followed by identification with differential diagnostic media. Antibiotic sensitivity was determined using the standard paper disc method. To isolate strictly anaerobic microorganisms from patients with purulent inflammatory diseases, the material was taken on a swab with a special transport-conserving mixture (10% lysed human blood, 10% glycerol and 8% physiological solution). Delivered material was inoculated by depletion (to obtain isolated colonies) on the surface of freshly prepared blood agar for bacteroides as well as in a special liquid medium. Cups and test tubes with seeds were immediately placed in microanaerostats which were filled with natural gas. The cultures were incubated at 37 °C for at least 48 h, after which they were viewed with a stereoscopic microscope and the number of colonies of each species was counted. The individual colonies were then transferred to liquid medium to obtain pure cultures. The isolated anaerobic microorganisms were tested for antibiotic sensitivity using a modified paper disc method. Результаты исследования. In the normergic type of inflammatory response, obligate anaerobic bacteria accounted for 57.5 % of association participants, facultative anaerobic and aerobic bacteria for 29.7 %, with microaerophilic species accounting for 12.8 %. Anaerobic cocci of the genus Peptostreptococcus constituted the majority (22 %).

Table 1 - Qualitative composition of the microflora of purulent wounds in patients with normergic inflammation

Type of micro-organisms	Number of strains	
	abs	%
Obligate anaerobic Including	57,4	59,6
Bacteroides	17,0	19,4
Peptostreptococcus	22,7	22,0
Peptococcus	2,0	4,2
Other	6,0	5,0
Facultative-anaerobic and aerobic	28	29,7
Obligate anaerobic Staphylococcus	18,0	20,8
Streptococcus	4,0	3,2
Others	6,0	5,7
Microaerophilic species	13,2	13,6
Total	94,2	100

In the hyperergic type of inflammatory response, there was activation of various resident microflora. A significantly greater number and number of bacterial species were isolated from the wound exudate than in other types of inflammation. Anaerobic microflora predominated (66 %) and was dominated by bacteria of the genus *Fusobacterium* (30.6 %), *Bacterioides* (10.4 %). In the hyperergic type of inflammatory reaction, obligate-anaerobic bacteria accounted for 71.5 % of the association participants, facultative-anaerobic and aerobic bacteria for 20.5 % and microaerophilic species for 8.4 %. The rates of total bacterial contamination of the wound exudate were also different for the different types of inflammation.

Conclusions: Skin lesions may thus be small and clinically unnoticeable. Predisposing factors for these infections include conditions that make the skin more fragile or local defence mechanisms less effective, such as obesity, previous skin cuts, venous insufficiency, lymphatic obstruction or other causes. Analysis of 10 years of microbiological data suggests the following conclusions. There is a tendency for the growth of purulent inflammatory diseases of the maxillofacial region. The etiological structure of purulent inflammatory processes of the maxillofacial region is changing. The main causative agents of the mentioned processes are the representatives of the resident flora of the macro-organism.

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