



## CHANGES IN MICROFLORA NON-SPECIFIC FACTORS PROTECTION OF THE ORAL CAVITY IN CHILDREN WITH INFLAMMATORY DISEASES OF MAXILLOFACIAL AREA

F.R.Kamalova., G.S.Tasheva

Department of pediatric dentistry, bukhara state medical institute, Bukhara

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### ✓ Summary

Today it is known that the protection of the organism from the pathogenic effects of microorganisms is primarily carried out by the oral mucosa due to the secretion of immunoglobulins. The pronounced bactericidal properties of the oral fluid are provided due to lysozymes, leukocytes and other enzymes.

**Key words:** oral cavity, immunity, microbes, immunoglobulin, inflammatory diseases, phlegmon, saliva

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**Relevance:** It has now been proven that various types of microorganisms play a certain role in the etiology and pathogenesis of inflammatory diseases of the oral cavity. This can be explained by a number of factors: endogenous infection, microbes in the oral cavity of a healthy person, and, in addition, in association, microbes can stimulate or inhibit certain properties of each other. The human oral cavity is an ecological system in which autochthonous microflora is formed. The optimal pH value for microbes, temperature, constant humidity and an abundance of nutrients favor this. A lot of microbes enter through the mouth from the external environment. It is known that a person swallows 1 billion microorganisms with saliva during the day, which are washed off the surface of the oral cavity [1.3].

According to various researchers, the share of obligate-aerobic and microaerophilic flora of the oral cavity accounts for 80-90% of the microbial landscape [1.5.8]. The main part is made up of facultative anaerobic species of staphylococci, streptococci, some enterobacteria, as well as anaerobic gram-negative dicocci. These microbes constitute the resident microflora of the oral cavity and form a rather complex and stable ecosystem [2.3].

As is known, odontogenic inflammatory diseases develop as a complication of caries. To date, the fact has been established that microorganisms, in particular Str.mutants, take a necessary, if not decisive, part in the development of dental caries. In the carious cavity, lactobacilli and streptococci are found in large numbers [4.7]. After the destruction of enamel and dentin, a healthy pulp is a biological barrier that prevents the penetration of various microbes into the periodontium.

According to some authors, microbiological examination of the purulent discharge of patients with odontogenic phlegmon in all (105 patients) showed bacterial growth. Monocultures were found in 11.4%, bacterial associations in 88.6%, obligate anaerobes were isolated in 88.6%, in pure culture in 6.4%. Analyzing the works devoted to the study of the microflora of odontogenic foci of inflammation in the oral fluid, we noted that many studies have been devoted to this issue.

However, there are few works reflecting the microbiological picture of purulent processes in children [6.8]. To date, it is known that the protection of the body from the pathogenic effects of microorganisms is primarily carried out by the mucous membrane of the oral cavity due to the secretion of immunoglobulins [9.10]. The pronounced bactericidal properties of the oral fluid are provided by lysozymes, leukocytes and other enzymes.

The aim of the study was to study changes in the humoral link of local immunity in odontogenic abscess - phlegmon of the maxillofacial region in children.

**Research objective:** To study the state of microbiocenosis of the wound and oral fluid in children with odontogenic inflammatory diseases. To give a clinical and immunological assessment of the factors of nonspecific protection of the oral cavity in children.

**Materials and methods:** All examined children were divided into 3 age groups: children from 2 to 5 years old, from 6 to 9 years old and 10-13 years old. To assess the features of the clinical course of the disease, all signs of the disease are divided into general and local. Each feature was expressed in points. Of the 105 patients, we carried out detailed clinical, microbiological and immunological studies in 74 patients. When analyzing the complaints of patients 2-5 years old who were admitted to the clinic (Multiprofile Medical Children's Center in Bukhara) with various phlegmon of the maxillofacial region, it was found that the younger the child, the more pronounced the general signs of the disease. To take into account the anamnestic clinical and laboratory studies of the course of the disease, we developed a map of the examination of a patient with various phlegmons, in which anamnestic information, general and local signs of the disease, laboratory data were entered, all complaints were carefully studied on the day of admission, taking into account local signs of inflammation. process, the general reaction of the body, previous and concomitant diseases, previous treatment.

Along with clinical and dental methods, microbiological and immunological studies were carried out in 74 patients with phlegmon of the maxillofacial region. Before performing emergency surgical care, oral fluid was taken from children into a sterile test tube. During the operation, immediately after opening, a swab was taken from the wound discharge, which was introduced into a sterile test tube.

An analysis of the results of the pus microflora in children with various phlegmons showed that bacteria were sown from the pus both as a monoinfection (*Str. pyogens*, *St. epidermidis*) and in an association of several microorganisms. The association most often included *St.aureus*, *Str.epidermidis*, *E. coli*, *LN. Str. hemolyticus*, *Ps. aeruginosa*, *Pr. Vulgaris*. For example, *St. aureus* was sown in 20 cases (14.8%), *St. epidermidis* in 19.3% (26 patients). A characteristic feature is the decrease in the number of anaerobic microorganisms, among which the most significant decrease in the number of peptostreptococci by 25.5% in relation to healthy data. Along with this, the amount of facultative flora sharply increases, the number of *Staphylococcus aureus* significantly increases to  $8.78\% + 0.18 \lg \text{CFU} / \text{ml}$ , hemolytic streptococci to  $4.31 + 0.83 \lg \text{CFU} / \text{ml}$ .

When studying the microbial landscape of the saliva of patients with phlegmon, we revealed the following fact: in the oral cavity before surgery, microorganisms that are not characteristic of this biotope are caused by strains of *Escherichia coli*. Thus, the number of lactopositive *Escherichia coli* was  $4.17 \pm 0.42 \lg \text{CFU/ml}$  and the LN of *E. coli* was  $2.15 \pm 0.21 \lg \text{CFU/ml}$ . These data indicate that not only dysbiotic changes occur in the oral cavity, but also a decrease in its resistance, barrier-protective functions are disturbed.

As mentioned above, lysozyme lyses gram-negative bacteria, inhibits the growth of pathogenic staphylococci and streptococci. In its absence, it is impossible to implement an immune response through SigA. According to the literature data, it is known that the deficiency of lysozyme is accompanied by the activation of the entire normal flora of the oral cavity. This was also confirmed by our research. According to our data, it can be seen that in healthy children it was  $17.8 \pm 0.54$  mg%, and in children with abscesses, phlegmon of the maxillofacial region, it was significantly reduced to  $7.08 \pm 0.18$  mg%. There was a decrease in the level of lysozyme by more than 60% relative to healthy ones, which can be explained by the fact that the amount of aerobes and fungi of the genus *Candida* increased in the oral fluid. In dynamics, the level of lysozyme by the end of traditional treatment, although it had a tendency to increase, nevertheless, did not reach the level of healthy children, which undoubtedly affected the recovery of children.

The phagocytic activity of neutrophilic leukocytes - the ability to capture and "digest" foreign complexes, in particular microbes, is an objective criterion for assessing not only the pathological, but also the physiological state of immune reactivity. The study of the phagocytic activity of leukocytes allowed us to identify the relationship between the severity of the disease and the effectiveness of the treatment. In healthy children FAN was  $54.3 \pm 1.24$ , and in patients with phlegmon  $31.3 \pm 0.31$ .

After full emergency surgical care (opening of purulent foci and tooth extraction) and drug treatment, the studied indicators tended to increase, but these changes were insignificant. Clinically, this manifested itself in the preservation of signs of inflammation, such as weakness, malaise, and purulent discharge continued for a long time.

In the oral fluid of patients upon admission, dysbiotic changes were revealed, characterized by a decrease in the number of anaerobic microorganisms with a sharp increase in facultative flora, not typical for this biotype of *E. coli* strains. Along with this, a sharp decrease in oral protection factors was found. These shifts were a prerequisite for exacerbation of focal odontogenic infection. After the opening of purulent foci in the oral fluid, a large number of gram "+", gram "-" cocci and *E. coli* are detected. Indicators of nonspecific protection factors tend to increase, but do not reach the indicators of healthy children.

The development of the inflammatory process is severe, its course depends not only on the age of the child, but also on the properties of the microflora. This is supported by the following observation:

Child A., 4 years old, was admitted to the clinic on 12/02/2016. No. ist. Bol. 25134. with a diagnosis of acute purulent periostitis of the upper jaw to the left of | IV. Complaints of high body temperature, headache, restlessness of the child, pain in the destroyed | IV.

From the anamnesis, it was established that the fourth tooth had been destroyed for a long time, twice he went to the dentist for acute pain, the treatment was not completed by filling the canals of the tooth. Two days before hospitalization, the growing pain in the fourth tooth reappeared, aggravated by closing the teeth. At the same time, the body temperature increased to  $37.8^{\circ}\text{C}$ . Parents gave the child paracetamol and analgin. The next day, the body temperature rose sharply, the child became restless.

During the night there was a swelling of the cheek and infraorbital region on the left, the skin over the swelling turned red. There was a purulent smell from the mouth. The child lost his appetite, stopped eating. In this condition, he was taken to the emergency department of the MIBC in Bukhara

and hospitalized for treatment in a hospital. At the time of admission, the body temperature reached 38°C.

The examination revealed an inflammatory infiltrate of the infraorbital region, an increase in lymph nodes in the posterior maxillary and submandibular regions. On the part of the oral cavity - the smoothness of the transitional folds at the level of | III, IV, V teeth. Mobility and sharp pain on percussion | IV tooth. Isolation of pus from the periodontal pocket. Many decayed teeth and very poor oral hygiene. In the blood, leukocytosis up to  $15 \cdot 10^9$ , ESR 16 mm/h. L.II. 2.8, this indicates the presence of an acute purulent process with signs of endogenous intoxication.

According to urgent indications, a child underwent a periostectomy and the “causal” was removed | IV tooth. Formed thick pus was obtained from the wound and the socket of the tooth. Despite the antibacterial therapy with broad-spectrum drugs, in the following days the body temperature rose to high numbers. By day 3, the alveolar process of the upper jaw was swollen, mobility appeared | III.V teeth and abscesses in the sky, which was an indication for the opening of the abscess of the sky. During the operation on the palate and the revision of the wound from the side of the transitional fold, a change in the color of the bone was noted. Taking into account the clinical data and the condition of the bone, the diagnosis was made: Acute purulent osteomyelitis of the upper jaw.

Microbiological studies of discharge from the wound found *St.aureus* and *E.coli* J1H.

As this clinical observation showed, the development of acute purulent periostitis in a child was preceded by chronic granulating periodontitis of the fourth tooth with frequent exacerbations. Twice after the exacerbation, the tooth was not healed. It must be assumed that as a result, a chronic focus of infection has formed at the top of the fourth tooth, which sensitizes the body to infection. The next exacerbation of the purulent focus led to the development of an acute purulent process in the periodontium of the fourth tooth and the periosteum according to the hyperergic type. Conducted emergency surgical care and antibiotic therapy was not enough to stop the acute inflammatory process, the process turned into acute osteomyelitis of the upper jaw on the right. Apparently, the current drug therapy was not effective enough against *St.aureus* and *E.coli* J1H isolated from pus, and nonspecific oral fluid protection factors were significantly reduced.

**Conclusion:** The high incidence of caries and its inflammatory complications in children under 6 years of age makes it necessary to carry out rehabilitation and preventive work in preschool institutions. For effective treatment and prevention of complications of acute odontogenic purulent periostitis, children should be hospitalized in dental clinics. Bacterial lysates should be included in the complex of drug therapy for acute purulent periostitis by injection into the wound and surrounding tissues after periostectomy. Bacterial lysates make it possible to normalize the microbiocenosis of the oral cavity, increase the level of sIgA, lysozyme titer, phagocytic activity of neutrophilic leukocytes, which reduces the clinical recovery time by 3 days.

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