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Analysis Of The Hygienic State Of The Oral Cavity In Children With Odontogenic Purulent-Inflammatory Diseases

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Relevance. Providing dental care by improving methods of early diagnosis and comprehensive treatment of odontogenic purulent-inflammatory diseases in children with frequent illnesses. According to experts, over the past ten years, odontogenic purulent-inflammatory diseases in children accounted for 20-30% of dental diseases, 70% of them had abscesses and phlegmons. For this reason, early diagnosis of odontogenic purulent-inflammatory diseases in frequently ill children and improvement of treatment methods in order to prevent severe complications of the disease is one of the important tasks of medicine, including dentistry.

Assessment of the incidence of odontogenic purulent-inflammatory diseases in children with varying degrees of somatic pathology, the use of local and general methods of treatment of the disease aimed at preventing complications. In this regard, various biological and chemical agents have been developed and proposed for local or general treatment after surgical interventions. However, methods have not been developed to improve pathogenetically based comprehensive treatment, depending on the type of odontogenic purulent inflammation among children often suffering from various diseases and indications, contraindications for use, depending on the specific situation. In this regard, improving the comprehensive treatment of odontogenic purulent-inflammatory diseases in frequently ill children is considered one of the urgent scientific and practical tasks of medicine. Today, our country has an organization of the health care system that provides a radical improvement in the quality, effectiveness and popularity of medical care to the population, including separate measures aimed at preventing inflammation of the face and jaws in children with odontogenic purulent-inflammatory diseases.

Despite the development of new methods to combat purulent infection, the number of sick children with inflammatory diseases remains high, especially children who are often ill. (Shargorodsky A. G., 2010; Robustova T. G., 2011). Inflammatory diseases of the maxillofacial region in childhood accounted for 21% of all surgical diseases and 52% of dental diseases. The researchers focused on many issues, such as the etiology, pathogenesis, prevention and treatment of purulent-inflammatory processes in the maxillofacial region (Fomichev E.V. et al., 2017; Nesterov A.V. et al., 2017). Also, acute inflammatory processes of the maxillofacial region in children often develop with a decrease in the immunological reactivity of the body, and the course of the disease and the possibility of complications are mainly determined by changes in the initial parameters of the immune system.

In children with odontogenic inflammatory diseases, sudden changes in inflammatory processes were observed due to the relative immaturity of organs and tissues, imperfect immunity, incomplete formation of lymphatic tissues, the presence of anatomical and physiological features of the structure of teeth and jaws, exposure to injury and its complications.

The results of many epidemiological studies show that there is a tendency for every child to have an average of 3-5 cases of acute respiratory viral infections (ARVI) per year. The greatest prevalence of ARVI was noted

in preschool children and primary school students. Children of the first 3 years of life suffer from infectious diseases 10 times faster than children aged 4-4.5 years and older. Complicated respiratory infections caused a violation of the functional state of the body, impaired adaptation and the development of chronic pathology were observed (Klyuchnikov S.O. et al., 2017).
Complicated infections in children are more often caused by the viruses Chlamydia spp and Mycoplasma spp, Haemophilus influenzae, Streptococcus pneumoniae, Streptococcus pyogenes, Staphylococcus aureus, Moraxella spp (Klyuchnikov S.O. et al., 2017)
Low activity of the immune system, metabolic diseases, decreased pain sensitivity change the clinical picture and course of many surgical diseases, which can lead to serious diagnostic errors and negatively affect the results of surgical pathology (Galimov O.V. et al., 2018; Zaitseva E.L., 2018).
It was found that in frequently ill children, odontogenic GVH and its complications are characterized by pronounced microcirculation disorders, microthrombi, the presence of dystrophic and necrotic processes, the predominance of the inflammatory component over the reparative one, the formation of cell proliferation, the formation of phagocytic activity of leukocytes, incomplete phagocytosis, a high degree of microcirculatory diseases, microbiological tissue damage, a decrease in general and local immune reactivity (Bulygin G.V. et al., 2010).
An analysis of studies conducted in Uzbekistan showed that studies were conducted on the prevalence, clinical picture, etiopathogenesis, treatment methods, prevention of periostitis of the jaw, abscess and phlegmon, odontogenic osteomyelitis in children with odontogenic GVH (Kamolova F.R., 2010; Asimov M.I., 2011; Ergashev V.A., 2018; Shadiev S.S., 2022). Among dental diseases, the number of patients with odontogenic GVH amounted to 10-11% of the total number of referrals, which ranks second after caries and its complications (Inoyatov A.Sh., 2019).

The purpose of the study to study the features of the treatment of odontogenic inflammatory diseases and improve comprehensive treatment.
Odontogenic purulent-inflammatory diseases in children of different ages, modern indicators of the course and prevalence of odontogenic purulent-inflammatory diseases, based on scientific sources of foreign and domestic researchers, modern interpretations and therapeutic methods for studying sensitivity to antibacterial drugs of children with odontogenic purulent-inflammatory diseases are considered and commented on.
Dental research was conducted in the following areas: KPU index, determination of the hygienic index of the oral cavity by the Fedorov-Volodkina method (1971); determination of the gingivitis index (IRMA) in the modification of Parma (1960). Indicators of the inflammatory and destructive index in the blood were studied by the method of A.I. Grudyanov.
Traditional bacteriological methods were used to determine the microflora of the oral cavity. The identification of microorganisms was carried out in accordance with Bergy's Manual Systematic Microbiology (1997). Food media from HiMedia (India) were used for germination of microorganisms. The disco diffusion method was used to study the resistance of bacteria to antibacterial drugs.
The amount of procalcitonin (PCT), C-reactive protein (CPO) and vitamin D in blood serum was determined using the fluorescence method on the Finecare FIA Meter Plus analyzer model FS-113 (Wondfo Biotech).
For statistical processing of the obtained results, generally accepted methods of variational statistics were used (Student's criterion, Pearson's criterion $\chi 2$, Fisher's exact criterion method). The Manny-Whitney criterion was used to compare independent populations in the absence of signs of normal data distribution. All tests were performed using Excel software on Pentium-IV personal computers. The principles of evidence-based medicine were strictly observed in the organization and conduct of research [1.3.5.7.9.11.13.15.17.19.21.23.25.27.28.29.31.33].
From the analysis of the above data, it was found that 122 (80.8%) of 151 patients with acute odontogenic GVH had other somatic diseases in 2019-2022. Only 29 (19.2%) patients had no other concomitant diseases.
Among the frequently ill patients included in the study, patients with acute odontogenic periostitis were the most registered and accounted for 43.4% of the total number of patients in the observation group; patients with acute odontogenic abscess and phlegmon – 40.2%; with acute odontogenic osteomyelitis – 16.4%. In the control group, patients with acute odontogenic abscess and phlegmon – 41.4%; patients with acute odontogenic periostitis – 27.6%; with acute odontogenic osteomyelitis – 31%.
As can be seen from the CPI index value was 3.21±0.11 in patients with acute odontogenic abscesses-phlegmon of the first observation group at the age of 3-6 years (n=20). The average score of the group of patients aged 7-11 years (n=19) was 5.25±0.35 ($p<0.05$). The CPI index in children of the first observation group (n = 10) aged 12-17 years is 4.62 ± 0.42. In the II observation group, in patients aged 3-6 years (n=16), acute odontogenic periostitis was 4.02±0.18 ($p<0.05$), while in patients aged 7-11 years (n=27), the frequency was 5.32±0.25

(p<0.05). The CPI index in children of the first observation group (n=10) aged 12-17 years was 4.62± 0.42. In the II observation group, in patients aged 3-6 years (n=16), acute odontogenic periostitis was 4.02±0.18 (p<0.05), while in patients aged 7-11 years (n=27), the frequency was 5.32±0.25 (p<0.05), compared with an average of 5.63±0.33 in children aged 12-17 years. In patients of the III follow-up group with acute odontogenic osteomyelitis (n=20), the CPI values are higher than in children with other odontogenic inflammations, averaging 4.12±0.21 (p<0.05), while in patients of the 7-11 years and 12-17 years groups it was 6.25±0.32 and 5.93±0.24.

When assessing the state of the PMA index, in the first observation group in patients with phlegmon abscess (n=49), this indicator was studied in accordance with age indicators, where the highest indicator compared to other age groups in patients aged 3-6 years (n=20) is 57.1±1.01%. In the groups of patients aged 7-11 years (n=19) and 12-17 years (n=10), the value of the PMA index was 48.6±1.35 and 49.7±1.32%, respectively (p<0.05). In the II observation group, acute odontogenic periostitis was detected in patients aged 3-6 years (n=16) with a frequency of 64.3±2.83% (p<0.05), in patients aged 7-11 years (n=27), this indicator was 52.6±2.61% (p<0.05), while in children 12-17 years old (n=10) on average 54.8±3.74%. In the III group of follow-up in patients with acute odontogenic osteomyelitis (n=20), the indices of the PMA index as well as CPI indices were higher than in children with other odontogenic inflammations. At the same time, patients aged 3-6 years (n=2) were accompanied by severe gingivitis, the average level of inflammation was 64.2±2.46% (p<0.05) and showed the most unsatisfactory indicator among children with all odontogenic purulent-inflammatory diseases. Although the level of inflammation in the gum tissue decreased with increasing age group, the degree of inflammation of the gum tissue remained high. For example, in the group of patients aged 7-11 years (n=9) and patients aged 12-17 years (n=9), it was 56.4±0.81 and 53.2±1.61, respectively [2.4.6.8.10.12.14.16.18.20.22.24.26.28].

The indicators of the intensity of caries KPU, assessing the level of inflammation of the gums of the PMA in patients of the control group, are presented in Table 1.

Table 1: Evaluation of OCPO and RMA in children of the control group

Age groups	**КПО**					
	I group, n=12		II group, n=8		III group, n=9	
	n	M±m	n	M±m	n	M±m
3-6 years	7	3,08±0,11	5	3,67±0,18*	7	3,61±0,21*
7-11 years	4	4,75±0,35*	2	4,5±0,25*	1	5±0,32
12-17 years	1	4±0,35	1	5±0,33	1	5±0,24
Total	12		8		10	
	PMA, %					
3-6 years	7	23,3±1,01	5	34,2±2,83*	7	45,3±2,46
7-11 years	4	34,5±1,35*	2	42,5±2,61*	1	47±0,81
12-17 years	1	34	1	21	1	43
Total	12		8		10	

Note: * - significant differences were noted compared to the control group p<0.05.

According to the results of the analysis of the data presented in Table 3, in patients with acute odontogenic abscesses-phlegmon of the I control group (n=7) at the age of 3-6 years, the value of the KPO index was 3.08±0.11.In patients of this group of 7-11 years (n=4), the average score was 4.56±0.35 (p<0.05), and the KPO index in children of the I control group of 12-17 years (n = 1) is 4 ± 0.35. Concomitant disease was not observed in the II control group, but acute odontogenic periostitis was detected in patients aged 3-6 years (n=5) and amounted to 3.67±0.18 (p<0.05), while in patients aged 7-11 years (n=2) the frequency was 4.5±0.25 (p<0.05), compared with the average of children aged 12-17 years - 5 ± 0.33. In patients aged 3-6 years (n=2) of the III control group with acute odontogenic osteomyelitis (n=7), the KPO indicators averaged 3.61±0.21 (p<0.05), in patients aged 7-11 years (n=9) and aged 12-17 years (n=9) 5±0.32 and 5±0.24, respectively.

Based on the analysis of the results of the assessment of the state of the PMA index in the age-related study of patients with abscess- phlegmon in the control group I of the control group, the lowest indicator (23.3±1.0%) was recorded at the age of 3-6 years (n=7). In the groups of patients aged 7-11 years (n=4) and 12-17 years (n=1), the value of the PMA index was 34.5±1.35 and 34%, respectively (p<0.05). In the II control group, acute odontogenic periostitis was detected in patients aged 3-6 years (n=5) 34.2±2.83% (p<0.05), in patients aged 7-11 years (n=2) in 42.5±2.61% (p<0.05) and in children aged 12-17 years (n=1) averaged 21%. In the III control

group, patients aged 3-6 years (n=7) with acute odontogenic osteomyelitis had moderate gingivitis (45.3±2.46%). While the degree of inflammation in the gum tissue is observed with a wave-like change in indicators with an increase in the age group, patients retain an intermediate level of inflammation of the gum tissue. For example, in patients aged 7-11 years (n=1), as well as in patients aged 12-17 years (n=1) 47±0.81 and 43%, respectively.

Thus, the index of oral hygiene in patients of the observation group of children aged 3-6 years, compared with patients of the same age in the control group, in groups I and II was 1.13 times higher, in group III 1.3 times higher, and in different age groups in children 7-11 years from 1.2 times to 1.4 times, and Also, there were no statistically significant differences in the group of patients aged 12-17 years ($p<0.05$).

The indicators of the inflammatory-destructive index in children with odontogenic GVH are shown in Figure 5.

When analyzing the results of biochemical analysis in patients of the control group, it was found that the results were lower than those of the observation group. Gram-negative opportunistic microorganisms and gram-positive cocci were observed among the identified microorganisms (Table 2).

E.coli, S.aureus, and S.pyogenes were mainly detected during monoinfection. 61% of the follow-up group and more than 75% of the control group were diagnosed with S.aureus. In the next place, S. pyogenes was observed in more than 40 and 44% of patients in the groups, respectively. In addition, E.coli, C.perfringens and other microorganisms were found in the purulent discharge. It was found that the number of all colony-forming microorganisms was significantly higher in patients of the control group.

Table 2: The results of microbiological analysis in the study groups

The microorganism	**The Monitoring Group n=122**		**The control group n=29**	
	KOE	**%**	**KOE**	**%**
S. aureus	$4,83x10^5$	61,47	$3,32x10^5$	75,86
S. pyogenes	$4,21x10^5$	40,16	$2,87x10^5$	44,82
E. coli	$2,33x10^4$	34,43	$6,75x10^3$	13,79
Cl. perfringens	$2,27x10^4$	26,23	$8,91x10^2$	3,45
Proteus spp.	$2,71x10^5$	20,49	$4,28x10^3$	6,89
E. cloacae	$2,34x10^4$	18,85	$4,54x10^3$	6,89
Neisseria spp.	$3,71x10^3$	18,85	$8,20x10^2$	10,34
Bacillus sp.	$1,08x10^5$	4,91	-	-

To assess the results of treatment of children with acute odontogenic GVD, patients were divided into 3 groups. In accordance with this, 62 frequently ill children aged 3 to 17 years with odontogenic GVH were used as the main group (OH), 60 children without concomitant disease as a comparison group (HS) and 29 patients with odontogenic purulent inflammatory diseases were involved as a control group (KG).

In accordance with this, the patients of the comparison and control groups used the traditional surgical treatment method of opening a purulent-inflammatory focus, antibacterial therapy, general symptomatic treatment, daily treatment of wound zones with furacillin and hydrogen peroxide. In the main group of patients, pyobacteriophage was additionally applied to the wound areas.

The indicators of the inflammatory-destructive index according to the results of treatment of children with odontogenic GVH are presented in Table 6.

From the data in the table below, it can be seen that as a result of the use of piobacteriophage in the foci of inflammation in patients with OH, there were distinct positive changes in VDI, where it decreased by 1.84 times in children 3-6 years old. Group I, and in patients with KG, it decreased by 1.51 times. The most positive changes in VDI were observed in patients of groups I and III of OH aged 7-11 years, with an average decrease of up to 1.88 times. In patients with HS, the decrease in the inflammatory-destructive index was in the range from 1.34 to 1.53 times.

In the general blood test, the most positive changes in the number of leukocytes were observed in the main group of patients receiving complex treatment, which was associated with the effective action of piobacteriophage [28.29.30.31.32.33].

In patients I and II, the OH of 3-6 years positively decreased to 7.47 x 109/l and 8.07 x 109/L, respectively. At that time, it was found that in these groups, in patients of the comparison and control groups, the indicators ranged from 8.5 x 109/l to 10.4 x 109/L. Positive results persisted in the older age groups.

Table 3: Indicators of the inflammatory-destructive index based on treatment in research groups

Age groups	I gruppa		II gruppa		III gruppa	
	VDI (Main Group)					
	n	M±m	n	M±m	n	M±m
3-6 years	10	613,22±14,25	8	667,42±14,52	1	643,42±16,24
7-11 years	10	574,36±19,23	14	581,41±11,12	5	728,46±14,61
12-17 years	5	566,42±14,75	5	544,34±10,26	4	714,23±14,73
Total	25		27		10	
	VDI (Comparison Group)					
3-6 years	10	742,41±14,72	8	781,43±14,56	1	776,46±19,45
7-11 years	9	673,43±17,27	13	671,75±11,43	4	813,47±11,76
12-17 years	5	676,47±13.54	5	725,47±10,56	5	803,68±14,76
Total	24		26		10	
	VDI (Comparison Group)					
3-6 years	7	532,18±9,23	5	692,51±12,17	7	688,49±11,32
7-11 years	4	578,46±14,02	2	642,84±8,35	1	752,31±9,13
12-17 years	1	525,21±9,42	1	645,32±6,23	1	766,12±8,67
Total	12		8		9	

The same positive changes in the main group were preserved in the rate of erythrocyte sedimentation, which clearly indicated the positive effect of the proposed treatment in acute odontogenic purulent processes. It was found that the positive changes in ESR in patients of the main group were even slower compared with patients of the control group without concomitant diseases.

To assess the effectiveness of treatment in children, there is another method based on reducing the amount of CRP formed during an acute inflammatory process. According to the results of this analysis, it was found that in the main group of patients, the indicators decreased from 1.6 to 2.05 times from the baseline level. Despite the fact that the lowest rates were observed in patients of the control group, the rate of decline did not exceed 1.7 times. In patients of the comparison group, the indicators decreased only from 1.2 to 1.4 times.

There was a decrease in the level of inflammation and a decrease in the amount of procalcitonin in all groups. It was found that in patients with OH, the indicators decreased to a normal level. In the comparison group, the indicators remained within the normal range.

Conclusions

1. In patients with odontogenic GVH, a frequent incidence of diseases such as anemia of the III degree, chronic herpetic stomatitis, chronic bronchitis, chronic tonsillitis, acute bronchitis was noted, in 113 patients (74.8%) - early morbidity of the 1st and 2nd temporary molars and the 1st permanent molar with caries and its complications It was assessed as the main risk factors.
2. An unsatisfactory level of oral hygiene in frequently ill children, complicated by acute odontogenic acute respiratory infections, a subcompensatory CP index (5.21 ± 0.35), the PMA index is located on the border of moderate and severe inflammation, have a direct effect on the severity of the inflammatory disease, which affects the clinical symptoms.
3. When using piobacteriophage in the treatment of acute odontogenic GVD in frequently ill children, disinfection of purulent-inflammatory foci was observed, which in turn led to a decrease in the quantitative indicators of pathogenic and conditionally pathogenic pathogens in purulent-inflammatory foci, improved oral hygiene and a decrease in the inflammatory state in the tissue.
4. The effective results of piobacteriophage, used in the complex treatment of acute odontogenic acute respiratory infections in frequently ill children, were reflected in the improvement of clinical signs of inflammation, shortening the duration of treatment and positive changes in laboratory and biochemical parameters during dynamic observations of the period after general therapeutic measures.

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