International Journal of Pediatrics and Genetics
Vol. 3 No. 11 (2025)
ISSN: 2995-5483

Methods of Preventing Dental Diseases Associated With Endocrine System Pathologies

Kholmatova Zarnigor Dilmurodovna[1]
Mukhamedova Malika Sagdullayevna[2]
Gulyamnazarova Dilorom Gafurjanovna[3]
Gulyamov Doniyor Toxirovich[4]
Hamidov Ilhom Sodiqjonovich[5]
Xasanov Elyor Turaevich[6]
Tashkent State Medical University[1.2.3.4.5.6]

Abstract: *Aspects of the relationship between somatic and dental diseases are multifaceted. On the one hand, the appearance and course of diseases in the organs and tissues of the oral cavity depends on the severity of common diseases, on the other hand, there is a database that shows the negative impact of dental diseases on the course of somatic pathology, the development of focal diseases of the body (bacterial endocarditis, rheumatism, etc.). Periodontal disease, poor hygiene, and lack of oral hygiene contribute to increased mortality from cancer.*

Key words: *endocrine system pathologies, dental diseases, oral cavity hygiene, periodontal tissue pathologies*

Introduction

Patients with endocrine system pathologies, as well as ischemic heart disease and hypertension, cardiovascular pathology, face a number of difficulties in the process of dental treatment (especially surgical). The greatest difficulties arise in the treatment of patients with somatic pathology, especially in combination with cardiovascular pathology and type 2 diabetes, which is an unfavorable prognostic factor and often creates conditions for the development of diseases of the oral cavity.

Periodontal diseases of Alzheimer 's disease beginning and increase for danger is a factor . This is mutual of influence in pathogenesis blood in plasma proliferative of the composition of mediators (IL-1, IL-6, FNO -α). in the increase periodontal of tissue i peripheral of inflammation importance big is , this to the aggravation of the process help gives and brain structures can cause a pathological condition .

The research purpose Endocrine system pathologies with sick the children mouth space and saliva composition determination methods improvement.

Research object. Endocrine system pathologies there are 122 people sick children's mouth space in changes saliva approximately the amount of organic and inorganic substances, vitamins, hormones was checked.

Result and analyses. Mineralization factors (organic and inorganic substances, vitamins, hormones) in the composition of saliva ensure the formation of enamel and the resistance of hard dental tissues. Calcium ions and phosphates, as the main elements of enamel hydroxyapatite, perform the mineralization function of mixed saliva, and the amount of calcium in saliva is half that in the blood due to its compounds with mucin (micelles). Calcium in saliva is present in ionized form (50%), in compounds with proteins (15%) and in compounds with citrates and phosphates (35%). The total level of calcium in saliva approaches its level in blood serum, and the amount of ionized calcium in serum exceeds the amount in saliva, while the concentration of calcium in saliva is directly dependent on the pH level. A shift of pH towards acidosis reduces the mineralization potential of saliva and causes calcium deficiency. Saliva, saturated with phosphorus and calcium ions and having an optimal pH value that performs a mineralizing

function, is a neutral or weakly alkaline environment. The level of ionized calcium in saliva is directly correlated with the rate of salivary secretion. It is also necessary to emphasize the role of mucin in maintaining phosphorus-calcium homeostasis. The preservation of the buffer properties of saliva is ensured by the formation of an adsorbed, insoluble, denatured, organic film on the tooth surface, consisting of complex compounds of phosphorus and calcium ions with mucin. Stable salivary secretion ensures the effective destruction of exo-, endogenous microorganisms and their metabolites, the maintenance of homeostatic balance in the oral cavity, as well as the stability of specific and nonspecific protective factors of the oral cavity.

In our studies, it was found that its level increased significantly compared to the control group: 34.5 ± 1.8 pkg / ml: - in group 1, IL-1 β increased by 1.97 times - to 68.2 ± 1.2 pkg / ml, in group 2 - by 3.0 times - to 106.5 ± 2.3 pkg / ml, in group 3 - by 2.5 times - to 86.4 ± 1.5 pkg / ml. This indicates the possibility of an acute stage of dental diseases against the background of diabetes mellitus in children.

IL-4 is known as an anti-inflammatory cytokine, produced by T lymphocytes. The anti-inflammatory effect of IL-4 is manifested in the suppression of the anti-inflammatory activity of macrophages and their production of IL-1, tumor necrosis factor, and IL-6 [1].

The results of a study of cytokine status in patients with type 1 diabetes showed that IL-4 levels decreased regardless of the presence of dental inflammatory diseases and age (Table 1).

Table 1

Endocrine system diseases exists children in the saliva cytokines concentration (M ± m)

Cytokines	Control group n=30	Group 1 n=30	Group 2 n=32	Group 3 n=35
IL-1β , pkg / ml	34.5±1.8	68.2±1.2*↑	106.5±2.3*↑	86.4±1.5*↑
IL-4 , pg / ml	8.1±0.3	6.8±0.5 * ↓	6.8 ± 0.6 * ↓	6.9±0.5 * ↓
IL-18 , pg / ml	35.3 ± 4.7	55.5± 5.0 * ↑	83.9± 6 , 8 *↑	101.1±5.1 * ↑
INF-γ , pkg / ml	21.8±1.2	9.8±1.5*↓	16.3±1.4 * ↓	19.2±1.8↓

Note : ** - control group to the information relatively noticeable differences (R< 0.05 - R<0.001).*

Salivary dysmotility and digestive dysfunction are common in patients with diabetes, which is explained by low salivary flow and pH, as well as a buffer system, but high glucose levels compared with healthy children. Up to 80% of patients with poor blood glucose control have reduced blood flow to the parotid gland, which leads to a decrease in salivary production by this gland. These data support a significant relationship between xerostomia and salivary glucose levels. However, while one study found no clear association between diabetes and decreased salivary flow in a pediatric population, another study found that 50% of children with diabetes have hyposalivation (<0.7 ml/min).

High levels of Candida albicans infection are found in 43.1% of patients with diabetes. Factors predisposing to oral candidiasis include: high levels of glucose in saliva, decreased salivary secretion, impaired chemotaxis, and defective phagocytosis, which are caused by a deficiency of polymorphonuclear leukocytes and a decrease in tissue resistance to infection.

There is new evidence linking endocrine disorders to periodontal disease. Endocrine disorders are a well-known risk factor for the development of periodontal disease. Conversely, pro-inflammatory molecules secreted by affected periodontal tissues can enter the bloodstream and cause insulin resistance. Obese children with endocrine disorders have poorer oral health compared with normal-weight children and obese children without diabetes. This study describes the oral microflora of obese and non-obese children. It is known that the dysbacteriosis of the oral cavity worsens the chronic catarrhal gingivitis due to the deterioration of the ecosystem in the mouth. And in this case, the natural immune response is activated first.

In addition, the results of numerous studies have focused on the basis of complications that type 1 diabetes causes in the oral cavity. Endocrine pathologies are a common chronic disease among children and are considered a global health problem. In addition, the onset of the disease in the early period of a child's

life is characterized by the fact that the process progresses and threatens the child's life. Usually, the presence of foci of gram-positive bacteria is important for the development of periodontitis. (*Aggregatibacter actinomycetemcomitans, Bacteroides spp., Campylobacter spp.* , etc.). The number of streptococci and lactobacteria in saliva has been found to be almost the same in patients with endocrine pathologies under positive control. Fungal infections of the oral cavity are more common in various immunodeficiency diseases than in healthy children. Evidence suggests that compared with nondiabetic children, diabetic patients have an increased incidence and abundance of Candida albicans. Some studies have shown that poor metabolic control, elevated salivary and blood glucose levels, longer duration of disease, and the presence of complications due to diabetes are associated with oral fungal overgrowth and clinical signs of candidiasis, while others have not. Oral microbiota assessment of children with type 1 diabetes has shown that their oral microbiota is more diverse and diverse than that of healthy individuals, with C. albicans and Streptococcus mutans being the main caries-causing microorganisms. Its consequences can lead to difficulty eating, poor school performance, and mental health problems, which can affect the quality of life of the child and his family, creating a significant socio-economic burden. In order to assess the importance of the biochemical mechanism in the pathogenesis of dental diseases in patients with diabetes mellitus in our study group (6-11 years old), we compared clinical and biochemical blood parameters. The study included 43 patients with dental caries on the background of type 1 diabetes mellitus, 38 children with chronic periodontitis, and 45 children with catarrhal gingivitis (a total of 126 patients). Based on the results obtained, a shift in blood biochemical parameters was detected in type 1 diabetes mellitus.

The results of the study of biochemical parameters in the blood of patients with type 1 diabetes mellitus aged 6 to 11 years showed that, depending on the clinical form of dental diseases, we observed a significant increase in all studied biochemical parameters of the blood in patients with caries, chronic periodontitis, and catarrhal gingivitis (Table 2).

Table 2

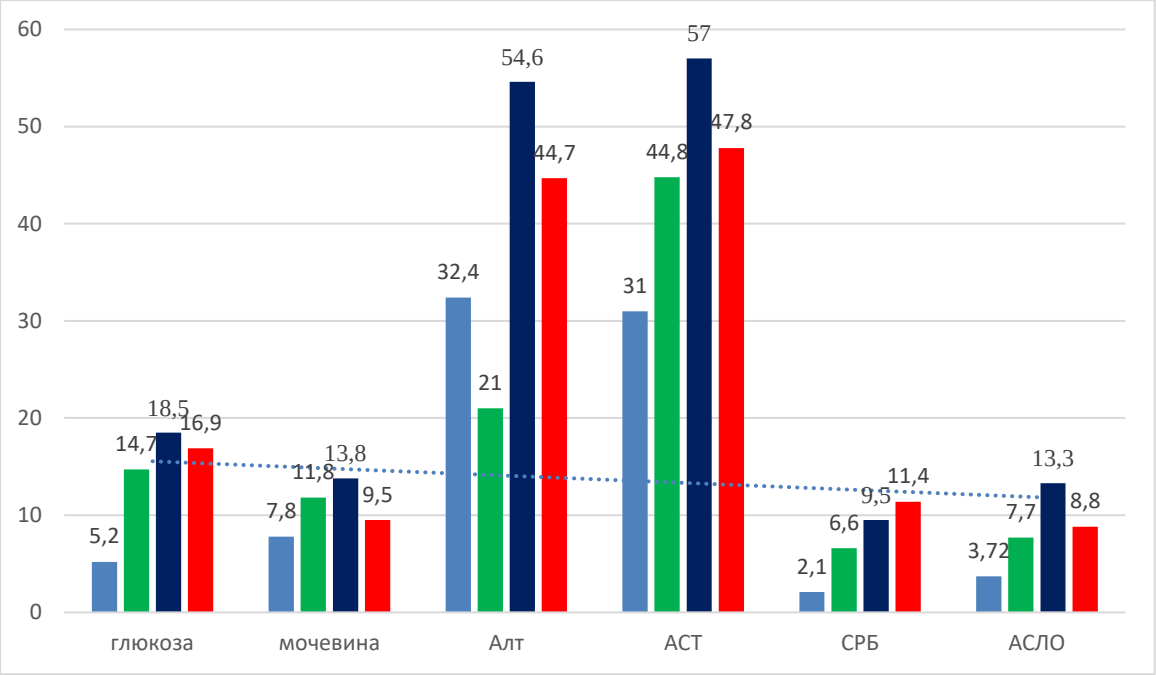
Biochemical parameters in the blood of patients with diseases of the endocrine system. (M ±m)

Indicators	Control group n=30	Diabetes + caries n=43	Diabetes+chronic periodontitis n=38	Diabetes+catarrhal gingivitis n = 45
Glucose g / l	5.2 ±1.0	14.7±1.5**	18.5± 1.5***	16.9± 1.3***
Urea µmol /L	7.8 ±0.7	11.8 ± 1.0*	13.8 ± 1.2*	9.5 ± 1.3
ALT mmol /L	32.4 ±0.5	21.0 ±1.2***	54.6 ±1.3***	44.7 ±1.9*
AST mmol /L	31.0 ± 2.1	44.8 ± 1.4*	57.0 ± 1.6***	47.8 ± 1.2*
SRB	2.1 ±0.8	6.6 ±0.9*	9.5 ±1.8*	11.4 ±1.5**
ASLO	3.72 ± 1.3	7.7± 1.4*	13.3±0.8**	8.8± 1.5*

Note: ** - control group to the information relatively noticeable differences (R< 0.05 - 0.001).*

In catarrhal gingivitis, a slight increase in blood urea from 7.8 ± 0.7 µmol / l to 9.5 ± 1.3 µmol / l was detected compared to control values. In patients with caries, chronic periodontitis, and chronic gingivitis, significant changes in liver enzymes were noted. As is known, ALT is an enzyme present in all cells of the body, mainly in the liver and kidneys, and less often in the heart and muscles. Normally, ALT activity in the blood is very low. However, ALT does not always reflect only liver damage; the activity of this enzyme can also increase in diseases of other organs. For example, in dental caries, a significant decrease in ALT levels to 21.0 ± 1.2 mmol / l was detected in this group of patients. In chronic periodontitis, this value increased compared to control values (32.4±0.5 mmol / l) to 54.6 ±1.3 mmol / l, and in catarrhal gingivitis - to 44.7±1.9 mmol / l. The same upward trend was observed in relation to AST in the blood in all groups of patients with type 1 diabetes. It should be noted that the presence of acute viral hepatitis C and B was excluded in all examined patients . Such specific changes in liver enzymes indicate a response

of liver tissue to diseases not directly related to the liver. (Fig. 1).



1- Fig. 1. With type 1 diabetes sick in children in dental diseases of blood biochemical indicators

Oral health care is recognized as an integral part of overall health. The oral cavity has many functions in daily life such as eating, speaking, social communication and appearance.

Several studies have been conducted to assess the relationship between endocrine system pathologies and dental caries. However, the results of the studies show that most patients with type 1 diabetes have dysfunction of the salivary glands, as well as changes in the biochemical and microbiological parameters of saliva. On the other hand, the antimicrobial defenses of diabetic patients may be stronger than those of healthy people. Good metabolic control helps prevent many complications. The results of the studies have provided information about the relationship between caries and the level of glycemic control. Currently, new rapid and easy methods for studying saliva have been developed that detect, measure and evaluate the patient's salivary flow rate, consistency, salivary pH value, stimulated and unstimulated salivary flow, and salivary buffering capacity.

Oral complications of endocrine system pathologies include xerostomia, periodontal inflammatory diseases, tooth abscesses, tooth loosening, etc. On the other hand, chronic inflammation can increase insulin resistance to some extent, resulting in impaired metabolic control.

Many human diseases are caused by dietary disorders, and there is also information about the widespread prevalence of caries due to this very reason. Metabolic diseases are a common cause of endocrine system pathologies in children. Several studies have been conducted to study the relationship between the two diseases, with different results. Modern studies, while determining the relationship between diet and dental caries in children with type 1 diabetes, have found that frequent consumption of soft drinks and snacks can affect the development of dental caries in children. There is also information about the fact that changes in the concentration of albumin and glucose in saliva can cause dental caries. One of the early and rapidly manifesting clinical signs of endocrine system pathologies is a violation of the secretory function of the salivary glands, which leads to xerostomia and the patient often complains of dry mouth. It is assumed that diabetic complications of salivary gland function may be associated with an autoimmune process of degeneration of salivary cells. At the same time, the mucous membrane is shiny, hyperemic, and catarrhal inflammation can cover almost the entire surface of the oral mucosa.

Conclusion. The composition and properties of saliva in patients with endocrine system pathologies differ significantly from those of somatologically healthy people. This especially applies to enzymatic activity. Almost always, the acid-base balance is disturbed, shifting towards acidosis. One of the most

important signs indicating changes in saliva is an increase in the amount of glucose compared to healthy people. There is a direct relationship between the amount of glucose in saliva and the amount of glucose in the blood.

List of used literature:

1. Bidra, A. S., Taylor, T. D., & Agar, J. R. (2013). Computer-aided technology for fabricating complete dentures: Systematic review of historical background, current status, and future perspectives. Journal of Prosthetic Dentistry, 109(6), 361-366.
2. Kattadiyil, M. T., Alhelal, A., & Goodacre, C. J. (2017). Clinical complications and quality assessments with computer-engineered complete dentures: A systematic review. Journal of Prosthetic Dentistry, 117(6), 721-728.
3. Kanazawa, M., Iwaki, M., Minakuchi, S., & Nomura, N. (2014). Digital impression and jaw relation Kamalova F.R. Pokaseteli rasprostranennosti i intensivnosti kariesa zubov u detey Bukharskogo region // A new day in medicine. - Bukhara, 2019. - #2(26). - S. 183-185 (14.00.00; #22).
4. Kamalova F.R., Bozorov M.Kh. Rol profilikaticheskikh stomatologicheskikh meropriyatiy u detey shkolnogo vozrasta // Problems of biology and medicine. - Samarkand, 2020. - No. 6 (124). - S. 48-51 (14.00.00; #19).
5. Kamalova F.R. Izuchenie stomatologicheskogo status u detey s sakharnym diabetom v Bukharskoy oblasti // A new day in medicine. – Bukhara, 2020. - #1(29). - S. 216-218 (14.00.00; #22).
6. Kamalova F.R. Pervichnaya profilikatika stomatologicheskikh zabolevaniy u detey stradayushchix s sakharnym diabetom //A new day in medicine. – Bukhara, 2020. - No. 2(30). - S. 383-387 (14.00.00; #22).
7. Kamalova F.R. Znachenie tsitokinovogo zvena pri stomatologicheskix zabolevaniyax u detey s saharnym diabetom 1-type // Doctor's newsletter. - Samarkand, 2020. - #4 (97). - S. 19-22 (14.00.00; #20).
8. Kamalova F.R., Bozorov M.Kh. Izmenenie mikroflory i nespecsificheskikh faktorov zashchity polosti rta u detey pri vospalitelnyx zabolevaniyax chelyustno-litsevoy oblasti // Doctor's newsletter. - Samarkand, 2020. - #4 (97). - S. 22-25 (14.00.00; #20).
9. Kamalova F.R., Eshonkulov G.T. Diagnostics and prevention of tooth anomalous and carious situation in children with diabetes // Stomatology. - Tashkent, 2020. - No. 4 (81). - S. 27-29 (14.00.00; #12).
10. Kamalova FR Diagnostic Value of Salivator Cytokines in Dental Diseases in Children With Diabetes Mellitus Type 1 // European journal of molecular & clinical medicine. - 2020. Vol . 7 - R. 2515-8260 (14.00.00; (3) Scopus).
11. Kamalova FR, Eshonkulov GT Early Diagnosis And Prevention Of Dentoalveolar Anomalies And Cariogenic Situation In Children Suffering From Diabetes // European Journal of Molecular & Clinical Medicine. - 2020. Vol . 7 - R. 2515-8260 (14.00.00; (3) Scopus).
12. Kamalova FR, Eshonkulov GT, Radjabov AA, Saidova MA The study of anomalies of maxilla-facial system of children's age in the Bukhara region // ACADEMICIA: An International Multidisciplinary Research Journal. - India , 2019. - Vol. 9 - R. 63-67 (14.00.00; SJIF = 6.152).
13. Kamalova FR, Turaeva FA, Afakova M. Sh.Eronov EK, Eshonkulov GT The dynamics of the prevalence of diabetes and the study of dental status in children of the Bukhara region // ACADEMICIA: An International Multidisciplinary Research Journal. - India , 2019. - Vol. 9 - R.151-153. -(14.00.00; (23) SJIF = 6.152)
14. Kamalova FR, Radjabov AA, Turaeva FN, Afakova M.Sh. Frequency of spread of a short frenum of the tongue and upper lip in preschool // AJMR- India , 2019. - Vol. 8. - R. 126-129 (14.00.00; SJIF = 6.053).
15. Kamalova FR Development and evaluation of the effectiveness of the dental dental examination program for children with diabetes in adverse environmental conditions // ACADEMICIA: An International Multidisciplinary Research Journal. - India , 2020. - Vol. 10. - R. 64-66 (14.00.00; SJIF =7.13).
16. Kamalova FR Therapeutic and preventive measures of dental diseases in children with diabetes //ACADEMICIA: An International Multidisciplinary Research Journal. - India , 2020. - Vol. 10. -

Vol. 3 No. 11 (2025)
ISSN: 2995-5483

R. 1920-1925 (14.00.00; SJIF =7.13).
17. Kamalova FR Prevention of dental anomalies and dental caries in children with diabetes // Middle European scientific bulletin. Czech Republic – 2020. - Vol. 5. - R. 92-93 (14.00.00; SJIF = 6.7)