PATHOLOGICAL CHANGES IN THE ORAL MUCOSA IN DIABETES MELLITUS

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Abstract. *Diabetes affects the condition of almost the entire body, including the oral cavity [4]. This reaction of the body is explained by the formation of ketone compounds when the amount of glucose increases, which are "poison" for all cells and tissues [3]. Against the background of this disease, various problems related to teeth, gums and periodontal tissues (periodontal tissues) can develop [3]. However, their appearance is related not only to the main disease - diabetes, but also to oral hygiene[2]. In this article, we will tell you how the condition of the oral cavity changes with diabetes and how to take care to prevent the development of problems with teeth and gums.*

Keywords*: listerine ® total care, bad breath, plaque, dry mouth symptoms.*

It has been proven that the manifestation of diabetes in the oral cavity does not occur or is mild in people who take good care of their teeth.

Dry mouth symptoms

Many people with diabetes notice that they produce less saliva and have a dry mouth, known as xerostomia [4]. As a rule, xerostomia is one of the first oral symptoms of diabetes mellitus [3]. Dry mouth is accompanied by increased appetite and thirst [4]. The cause of the registered complaints is an increase in the level of glucose in the blood and a "jump" in its content during the 3rd day. In addition to the decrease in saliva, the composition of saliva also changes - the amount of glucose in it increases [4]. All this creates favorable conditions for the development of dysbiosis in the oral cavity - the number of "dangerous" microbes that because inflammation increases by [3]. Xerostomia can also cause pain, mucosal ulcers, infections and caries 4.

Plaque

Lack of saliva and high sugar levels in saliva and tissues is an excellent breeding ground for many "harmful" microbes. Glucose is a source of energy for them [3], and since there is little saliva, not all bacteria are washed off the tooth surface [8]. Remaining in the oral cavity, bacteria begin to actively multiply - thus a soft plaque is formed, which later becomes denser and turns into tartar [3]. With diabetes, mineral metabolism is also disturbed - calcium and fluoride are washed out of the body, bone tissue is destroyed, and enamel becomes brittle. The acid produced by the microbes in the oral cavity quickly penetrates the hard tissues of the teeth and destroys them, causing caries [3].

Bad breath

65% of patients with diabetes develop bad breath (halitosis). The main cause of this smell is volatile sulfur compounds produced by bacteria [7] [8]. If you do not pay attention to hygiene, food residues accumulate on the surface of the teeth, in the spaces between the teeth, as well as on the back of the tongue. Microbes consume food residues and in the process of their vital activity emit foul-smelling sulfur compounds [8]. Dry mouth also contributes to the appearance of halitosis - the

decrease in saliva production leads to the deterioration of the natural cleaning of the oral cavity. As a result, favorable conditions are created for the growth of bacteria that produce sulfur compounds [8].

Inflammatory diseases of the oral cavity

Gum and periodontal diseases are 3 times more common in patients with diabetes and more severe than in people with normal blood sugar levels. The reason for this is that blood vessels are affected in diabetes, bone tissue is destroyed, and local immunity in the oral cavity decreases [5]. When the walls of blood vessels thicken, the flow of nutrients to the gums and periodontium slows down, while the removal of waste products from them is impaired. Poor blood circulation reduces the body's ability to fight infections, and bacteria living on dental plaque cause inflammation [4]. Timely detection and treatment of inflammatory diseases in the oral cavity is important - this has a beneficial effect not only on the oral cavity, but also on the level of glucose in the blood [5]. It has been proven that diabetes patients have high blood sugar levels when they have gum disease or periodontal inflammation. With any inflammatory process, including in the oral cavity, the production of active substances - inflammatory mediators - increases. They contribute to the development of insulin resistance, which is the basis of diabetes mellitus. Often, a dentist can first suspect diabetes based on the following symptoms [2]: Gum swelling, cyanosis and bleeding; Heavy plaque on the teeth.

If you notice any of these symptoms, visit your dentist and pay attention to your daily dental care. Good oral hygiene is especially important if you have diabetes – poor blood sugar control increases your risk of developing dental disease. The more poorly controlled your diabetes is, the more likely you are to develop oral inflammation [4].

Features of oral care for diabetes

For people with diabetes, oral hygiene is not just about brushing, but infection control, which is important for overall health [2]. Here are some tips to help you maintain good oral health:

You should brush your teeth regularly, at least twice a day: in the morning, after breakfast (not before) and in the evening after the last meal (before going to bed). Cleaning time should be at least [3] minutes [6]. Whether it's a full meal or a light snack, brush not only your teeth but also your tongue after every meal [2]. Clean from all sides with sweeping movements from the gum to the edge of the tooth [6]. Use a soft-bristled toothbrush that effectively removes plaque without damaging the gums [2]. After each cleaning, wash the brush with soap and water and store it in an upright position with the head facing upwards. Change it at least once a month [6]. In addition to the toothbrush and toothpaste, use additional products: mouthwash, dental floss or brushes [2]. Choose antimicrobial toothpastes and mouthwashes to reduce plaque build-up and prevent the growth of germs between brushes [2]. It is good that the products contain fluoride - it strengthens the enamel and protects it from caries [2].

LISTERINE ® TOTAL CARE - comprehensively protects the oral cavity. Detergent has 6 advantages:

Destroys 99% of bacteria [10];

Reduces plaque [12];

Prevents the formation of tartar [13];

Supports gum health [14];

Protects against caries [15];

Refreshes breath [17].

Oral diseases associated with diabetes occur in 87% of patients [3]. Careful care of the oral cavity will help to alleviate their course or completely prevent it. Proper hygiene is the basis for the prevention and treatment of any inflammatory diseases of the oral cavity, as they are caused by plaque bacteria. For people with diabetes, oral hygiene is a mandatory and very important daily routine to maintain health [2].

Conclusion

In conclusion, diabetes mellitus can lead to a variety of pathological changes in the oral mucosa. These changes are primarily attributed to the underlying metabolic disturbances and compromised immune function associated with diabetes. Common oral manifestations include an increased prevalence and severity of periodontal disease, impaired wound healing, decreased salivary flow, oral candidiasis, and altered taste sensation. The presence of diabetes alters the oral microenvironment, creating an environment conducive to the growth of periodontal pathogens. This, coupled with impaired immune response, results in an increased risk of periodontal disease, characterized by inflammation, bleeding gums, and eventual tooth loss if left untreated. Additionally, the compromised immune function and impaired blood circulation in diabetes contribute to delayed wound healing in the oral cavity, making individuals with diabetes more susceptible to oral infections and ulcers.

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