



CHANGES OF SKIN AND ORAL MUCOSA IN DIABETES MELLITUS AND THEIR PREVENTION

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Annotation:In article the most often arising diseases from skin are described and a mucosa of an oral cavity at patients with a diabetes mellitus: mechanisms of their emergence, prophylaxis methods.

Key words: diabetes mellitus, dermatoses, pathology of the oral mucosa and caries, prevention.

Experts from the World Diabetes Federation (IDF) predict that the number of people with diabetes will increase by 1.5 times by 2030 and reach 552 million people, and the proportion of the population with metabolic syndrome will increase to 800 million people. It is from this group that the number of patients with diabetes mellitus increases by 15% annually. It is important to note that for every patient with an established diagnosis of this disease, there is one patient with an undiagnosed disease. This pathology is more often not diagnosed in a timely manner in men than in women.

When examining a patient, any doctor, including a therapist and an endocrinologist, encounters complaints and pathological changes in the skin and mucous membrane of the oral cavity. These changes in diabetes mellitus occur in most patients and are often one of the first symptoms of this disease.

Manifestations can be long-lasting, recurrent and, against the background of uncompensated diabetes mellitus, are difficult to treat.

Considering the rate of spread of diabetes mellitus, a large number of undiagnosed disorders of carbohydrate metabolism, changes in the skin and oral mucosa, which are easily accessible for examination, can help make a timely diagnosis in the patient. Human skin is a multifunctional and more complex organ in nature. It does not function on its own, but is closely connected with all internal organs and systems. The skin is the most accessible organ for research. It is the condition and appearance of the skin that often becomes an indicator of certain disorders developing in the body and can clarify the diagnosis of many internal diseases, including diabetes. The skin has a number of functions - protective, thermoregulatory, receptor, excretory, absorption, respiratory; under the influence of ultraviolet radiation, vitamin D₃ is formed in it.

With age, the regeneration processes of the epidermis in the skin decrease, susceptibility to damaging factors (especially UV rays) increases, sweat production decreases, and the functioning of the sebaceous glands decreases. The protective function suffers, the loss of vitamin D increases. The skin loses its hydrophilicity, becomes dehydrated, the skin vessels become sclerotic - all this leads to its gradual atrophy, loss of elasticity, and the appearance of folding and wrinkling of the epidermis relief.

The pathogenesis of skin lesions in diabetes mellitus is complex. It is based on a violation of carbohydrate metabolism, but other factors also play a significant role. Hyperglycemia leads to extra- and intracellular dehydration, disruption of the stability of cell membranes and, as a consequence, the energy metabolism of skin cells, sebaceous and sweat glands. These changes lead to disruption of the normal restoration of the

epidermis and the formation of a protective fatty film. Visually, this is manifested by severe dryness, decreased elasticity and turgor of the skin, the appearance of peeling and hyperkeratosis in areas of friction or pressure.

The presence of hyperinsulinemia and insulin resistance in patients leads to excessive binding of insulin to insulin-like growth factor 1 receptors of keratocytes and fibroblasts and, as a consequence, to epidermal hyperplasia (hyperkeratosis). Autoimmune mechanisms play a more significant role in patients with type 1 diabetes, and the structural units of the skin are damaged by immune complexes. In uncontrolled diabetes, the inability to metabolize and release triglyceride-rich chylomicrons and very low density lipoproteins. This can lead to a significant increase in plasma triglyceride levels and their accumulation in the skin. Disorders of lipid metabolism contribute to the development and progression of arteriosclerosis in all patients with diabetes. Considering the rate of spread of diabetes mellitus, a large number of undiagnosed disorders of carbohydrate metabolism, changes in the skin and oral mucosa, which are easily accessible for examination, can help make a timely diagnosis in the patient. In addition to metabolic causes, disruption of their trophism due to the angio- and polyneuropathy present in a patient with diabetes mellitus plays an important role in the formation of disorders of the skin and its appendages.

Elevated blood sugar levels over a long period of time can lead to damage to the blood circulation both in large arteries and in small vessels (capillaries), which help deliver nutrients to skin cells and ensure its trophism. In combination with large vessel atherosclerosis, these microvascular abnormalities contribute to the formation of diabetic ulcers. Most patients with long-term uncompensated diabetes mellitus have a loss of sensitivity in the legs to pain, temperature and tactile influences, and a violation of the excretory function of the skin, which is dependent on innervation. This leads to the formation of hyperkeratosis, disruption of skin trophism, and injury to the skin of the lower extremities, often unnoticed by the patient.

It is believed that the basis for the depletion of the skin in blood vessels and nerve structures is the excessive formation of free radicals, the main of which is superoxide. It disrupts the activity of mitochondria, which provide energy needs, and leads to cell death. The protective role in this case is played by the enzyme superoxide dismutase; it is a "trap" for superoxide. However, in diabetes mellitus, the formation of superoxide dismutase is reduced, and this is one of the causes of skin damage.

Angio- and neuropathy increases the risk of skin damage in patients with diabetes, and healing processes are affected. These changes, together with chronic hyperglycemia, contribute to the addition of an infectious component - bacterial and fungal infection.

Currently, dozens of types of dermatoses have been described that either precede diabetes mellitus or develop against the background of the disease. There are several classifications of skin lesions in diabetes mellitus (DM). They are based on clinical characteristics and some aspects of the pathogenesis of skin changes. These classifications are practically the same and only complement each other. So, according to the classification.

Khlebnikova A.N., Marycheva N.V. (2011) , conventionally, skin pathology in diabetes mellitus is divided into five main groups:

- 1) dermatoses associated with diabetes;
- 2) skin pathology associated with diabetes and insulin resistance;
- 3) skin pathology associated with angiopathy;
- 4) idiopathic rashes;
- 5) bacterial and fungal infections.

In the classification described by Andrea A. Kalus, Andy J. Chien, John E. Olerud (2012), the following groups of diabetes-associated skin lesions are distinguished:

- 1) skin manifestations of diabetes mellitus associated with metabolic, vascular, neurological or immune disorders (diabetic scleredema, diabetic cheiropathy (limited joint mobility) and scleroderma-like (pareneoplastic) syndrome, acanthosis nigricans, eruptive xanthomas, skin infections (bacterial, fungal));
- 2) diseases associated with diabetes mellitus with unclear pathogenesis (necrobiosis lipoidica, granuloma annulare, diabetic bladder, diabetic dermopathy). The feet are the most vulnerable to infection. Due to disturbances in nerve conduction (diabetic neuropathy), pain sensitivity in the lower extremities is reduced in diabetes, and disturbances in capillary blood flow (microangiopathy) sharply reduce the rate of skin regeneration. As a result of neuro- and angiopathy, the musculoskeletal structures of the foot also begin to

suffer: when walking, a person places his foot unevenly, and the main load falls on some part of the foot, injuring it - hyperkeratoses (calluses, corns) and cracks appear, and subsequent ulcers.

Today, patients with diabetes can find in pharmacies everything they need for special skin care. A sufficient selection of effective and affordable products will help ensure thorough skin care when diabetes mellitus is a good habit, improve the quality of life of patients and avoid the development of a number of serious complications. The widest line of specialized skin care for diabetes is a Russian development - a series of DiaDerm creams. In uncontrolled diabetes, the inability to metabolize and release triglyceride-rich chylomicrons and very low-density lipoproteins can lead to significantly elevated plasma triglyceride levels and accumulation in the skin.

According to the evaluation of the effectiveness of the use of cosmetics from the DiaDerm series, carried out on the basis of the Department of Dermatovenereology and Clinical Mycology with a course of laboratory diagnostics and laboratory mycology at the RMAPO (Moscow), patients with diabetes have a pronounced moisturizing and regenerating effect, which clinically manifests itself in the form of a significant improvement in the skin status of such patients, as well as the preventive effect of DiaDerm Protective cream protecting the skin of the feet of patients from mycotic infections. The results of objective studies indicate a tendency towards normalization of functional parameters of the skin (hydration, oil content, pH, laser optophotometry indicators) when using DiaDerm Protective and DiaDerm Softening creams.

In the study, DiaDerm talc cream was also shown to be highly effective for the treatment of diaper rash in large skin folds in patients with diabetes. This cream has a pronounced drying effect, anti-inflammatory and antiseptic activity. All patients noted the ease of use and pleasant texture of the talc cream.

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According to subjective assessments of patients, a noticeable drying effect from the use of the drug is observed after 1-2 times of use. Unpleasant subjective sensations of itching, pain and increased sensitivity were relieved 2-3 days after the start of use. Also in the series are: foot cream DiaDerm Intensive 10% urea to eliminate dry calluses and corns, body skin cream DiaDerm Regenerating to accelerate the healing of skin microdamages (insulin injection sites, capillary skin sampling for analysis), hand and nail cream DiaDerm for care for very dry hand skin.

Dialtraderm creams have also been developed especially for patients with diabetes. A positive assessment was given to the creams Dialtraderm AQUA with a high content of super-oxide dismutase and Dialtraderm Silver tested at the Department of Endocrinology and Diabetology of the Federal University of the Russian State Medical University.

With diabetes mellitus, changes also occur in the oral mucosa. The epithelial layer becomes thinner, the size of cellular elements decreases, elastic fibers thicken, and collagen bundles become unfibered.

With this disease, the secretion of saliva is disrupted (its quality and quantity decreases), which favors the development of pathology of the oral mucosa and caries, forcing such patients to visit the dentist more often. According to the literature, dental health in patients with diabetes mellitus worsens:

- Accelerated eruption of permanent teeth in children is observed, accompanied by gingivitis.
- There are structural changes in the salivary glands, impaired salivation and biochemical changes in the composition of saliva, which, in turn, causes xerostomia (dry mouth) and the development of further complications: multiple caries, candidiasis, halitosis.
- Increases susceptibility to caries, increases the likelihood of tooth loss; all this is associated with a high level of glycated hemoglobin.
- Against the background of systemic immunosuppression, chronic diseases of the oral mucosa develop (lichen planus, recurrent aphthous stomatitis, recurrent bacterial, viral and fungal stomatitis), opportunistic infections, multiple abscesses during periodontitis, halitosis, the repair period during surgical interventions is prolonged, and engraftment worsens. implants.
- Neurological disorders manifest themselves in the oral cavity in the form of stomatalgia (the main symptoms are burning in the mouth and tongue) and taste perversion; long-term existence of dentalgia leads to poor oral hygiene, and taste perversion leads to hyperphagia and obesity, inability to follow a diet; As a

result, glycemic control worsens in diabetic patients.

■ Changes in the microflora of the oral cavity are characterized by the fact that periodontopathogenic flora increases tissue resistance to insulin and contributes to the deterioration of metabolic control of diabetes, and the high concentration of glucose in the gingival fluid, impaired neutrophil adhesion, chemotaxis and phagocytosis, characteristic of diabetes, contribute to the proliferation and persistence of subgingival microflora.

In international and domestic practical recommendations for the management of patients with diabetes, little attention is paid to the relationship between diabetes and oral pathology, although patients, having received the necessary knowledge, could more effectively observe oral hygiene, notice the first signs of pathological changes, regularly seek professional dental care, which would help maintain dental health and improve glycemic control. Inflammatory periodontal diseases occurring against the background of somatic pathology have a long-term chronic course, often resistant to treatment, and, despite the improvement of diagnostic methods, a wide arsenal of conservative and surgical treatment methods and increased attention to prevention, they remain a significant problem in modern dentistry.

As a rule, after 55 years of age, a significant number of diabetic patients no longer have their own teeth. After tooth extraction, the wound healing process is much more difficult and longer. In order to prevent the development of complications in the oral cavity, it is necessary to compensate for diabetes mellitus, as well as to motivate patients with diabetes mellitus to strictly observe a number of hygienic requirements.

A good effect is shown by the comprehensive use of specialized oral care products for diabetes DiaDent. Conducted clinical trials on the basis of the Municipal Medical University SP No. 7 in Samara of therapeutic and prophylactic toothpastes and rinses of the DiaDent series in patients with diabetes mellitus showed that they have a cleansing effect, effectively remove plaque and have an anti-inflammatory effect, expressed in the reduction of periodontal indices. It was found that with long-term use in patients with diabetes mellitus DiaDent Regular toothpaste had a more pronounced cleaning ability, and DiaDent Active paste and rinse had a more pronounced hemostatic and anti-inflammatory effect. No allergic reactions or local irritating effects of the studied toothpastes and rinses on the oral mucosa were detected in patients with diabetes mellitus.

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On the basis of the Center for Preventive Dentistry with the participation of the Department of Preventive Dentistry of the State Medical University named after Academician I.P. Pavlova in St. Petersburg, in a clinical and laboratory study, it was shown that that DiaDent oral balm is a therapeutic and prophylactic agent for improving daily oral hygiene, which is expressed in reducing dry mouth, and preventing the development of infectious diseases, including candidiasis. It is a highly effective remedy not only for patients with diabetes, but also for people suffering from xerostomia and the accompanying manifestation - halitosis.

Thus, monitoring diabetes, observing simple hygiene rules, undergoing preventive examinations with dentists and periodontists, and paying attention to the choice of oral care products help avoid the occurrence of dangerous oral diseases caused by the underlying disease - diabetes, and also help improve the quality of compensation. diabetes itself.

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