DIABETIC PATIENTS WITH CATARACTS

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Annotation: This article about pathology is a complex of changes in the structure of the lens, developing due to a violation of carbohydrate metabolism in the body. The second type of diabetes mellitus is accompanied by damage to the natural optical lens more often than the first type of the disease. The rapid development of diabetic cataracts begins with an increase in blood glucose levels.

Key words: diabetic cataract, cataract,eye.

It has been proven that with an increase in blood sugar concentration, it is determined in the structure of aqueous humor. With the decomposition of diabetes, the physiological glycolytic pathway of dextrose absorption is disrupted. This leads to its conversion to sorbitol. This hexahydric alcohol is unable to penetrate cell membranes, which causes osmotic stress. If glucose values exceed the reference values for a long time, sorbitol accumulates in the lens, which entails a decrease in its transparency.

Diabetic cataract is a complex of pathological changes in the lens that develop against the background of impaired carbohydrate metabolism in patients with diabetes mellitus. According to statistical data, pathology occurs in 16.8% of patients suffering from impaired glucose tolerance. In persons over 40 years of age, dysfunction can be visualized in 80% of cases. In the general structure of the prevalence of cataracts, the share of the diabetic form accounts for 6%, every year there is a tendency to an increase in this indicator. The second type of diabetes mellitus is accompanied by damage to the lens 37.8% more often than the first. In women, the disease is diagnosed twice as often as in men.

With excessive accumulation of acetone and dextrose in the lens masses, the sensitivity of proteins to the effects of light increases. Photochemical reactions underlie localized haze. An increase in osmotic pressure leads to excess hydration and edema. Metabolic acidosis stimulates the activation of proteolysis enzymes that initiate denaturation of proteins. An important role in the pathogenesis is played by the edema and degeneration of the celery processes. In this case, the trophism of the lens is significantly disturbed. Cataract is a common disease that occurs, among other things, against the background of diabetes due to the destruction of the lens of the eye by glucose, microvascular circulatory disorders. Both conservative treatment with medications at the beginning of the development of the disease can be carried out, and an operation can be prescribed to radically solve the problem.

If the patient takes insulin, the clinical picture of the pathology manifests itself in an earlier period. It is caused by insulin deficiency and chronic hyperglycemia. The risk of developing lens opacity depends on how long the patient has diabetes. The longer he suffers from this disease, the more likely the lens structure will change. A chain of pathological processes is triggered by a sharp transition from oral hypoglycemic drugs to inject able insulin. Visual impairment can be avoided with timely treatment of carbohydrate metabolism dysfunction. Symptoms depend on the stage at which the underlying disease is. The initial stage of diabetes development may be accompanied by a slight deterioration in vision or its preservation in full. Some patients note that they have become better at seeing objects located at close range.

As soon as the volume of opacity increases, patients complain of dots or flies in front of the eyes, increased sensitivity to light. They lose their clarity of vision due to interference appearing in the field of view. When looking at a light source, multi-colored rainbow circles appear. An alarm bell will be the appearance of a yellowish tint in all objects.The mature form of diabetes mellitus is accompanied by a sharp decrease in visual acuity. Patients lose the ability to navigate in space and to serve themselves in everyday life. Relatives notice that the color of the pupil changes. Through the lumen of its opening, an optical lens is visible, which becomes cloudy and becomes whitish.

The use of glasses or contact lenses does not compensate for visual dysfunction. Patients claim that they see a little better, but the vision continues to "fall". In diabetics, both eyes are affected with varying intensity. Cataracts in diabetes do not develop due to an excess of sugar in the lens masses, because this requires a deadly five percent concentration. However,

there is a direct relationship between the rate of lens opacity and the concentration of sugars in the moisture of the anterior chamber of the eye. A sharp increase in the level of sugar in the moisture of the anterior chamber in uncompensated diabetes leads to blocking of the glycolytic pathway of assimilation and the transition to sorbitol.

The conversion of glucose into sorbitol causes galactose cataracts, because biological membranes are impenetrable for sorbitol. The accumulation of sorbitol in the lens leads to the development of true diabetic cataract.With endocrine disorders, direct damage to the lens fibers is also possible. Excess glucose causes a decrease in the permeability of the lens capsule, a violation of local metabolism and moisture circulation. As a result, metabolic processes and circulation in the lens are disrupted, which causes clouding. In diabetes mellitus, edema and degeneration of the epithelium of the ciliary processes are also noted, which leads to a deterioration in the nutrition of the lens.

Diabetic acidosis may also be the cause. With reduced acidity, proteolytic enzymes are activated that can stimulate turbidity. Diabetes also affects lens hydration, as osmotic pressure in tissue fluids decreases.There is a photochemical theory of the development of cataracts in diabetes. It is based on the fact that excess sugar and acetone in the lens increases the sensitivity of proteins to light, which causes them to cloud. The exact pathogenesis of diabetic cataract is not fully understood, but each of these factors has its own effect.

Diabetic cataract treatment

Conservative therapeutic methods in the form of eye drops can only slow down the process of lens opacity for a while. However, such treatments are not able to completely correct the situation. Patients diagnosed with diabetes mellitus are prescribed a surgical operation to restore vision.The method of phacoemulsification of the lens is often used. It involves crushing a natural lens with the subsequent installation of an intraocular lens. The surgeon helps the patient to choose the type of IOL, depending on the severity of the disease and associated disorders. With the help of an intraocular lens, you can not only restore vision, but also correct various refractive errors. Artificial lenses help correct astigmatism, myopia and hyperopia.

When initial changes are detected, the goal of treatment is to achieve tolerant blood glucose values and compensate for diabetes. Normalization of carbohydrate metabolism is possible with a diet, the use of oral antihyperglycemic drugs and insulin injections. The timely appointment of conservative therapy makes it possible to positively influence the dynamics of cataract development, to ensure its partial or complete resorption. At the mature stage, the normalization of blood sugar levels is no less important, however, it is impossible to achieve even partial restoration of the transparency of the lens with coarse opacities.

To prevent the progression of pathology, instillations of riboflavin, ascorbic and nicotinic acids are prescribed. In the immature form, drugs based on cytochrome-C, a combination of inorganic salts and vitamins are used. The efficiency of introducing drugs into ophthalmological practice has been proven, the active component of which is a synthetic substance that prevents the oxidation of sulfhydryl radicals of soluble proteins that are part of hexagonal cells.

Surgical treatment involves microsurgical removal of the lens (ultrasonic phacoemulsification), followed by implantation of an intraocular lens into a capsule. Surgery is performed with severe visual dysfunction. At the initial stage, it is advisable to remove a cataract if its presence makes it difficult to conduct vitreoretinal surgery or laser coagulation of the inner membrane in diabetic retinopathy.

Surgery is best done when the cataract is in its early or immature stage. At the same time, the patient retains all reflexes of the fundus, there are no obstacles to a full diagnosis. Mature and overripe cataracts require increased ultrasound energy. This increases the stress on the eye tissues, which carries certain risks.

In diabetes, all vessels are very weak, therefore, it is undesirable to carry out such a surgical intervention. With a mature cataract, the zinc ligaments weaken, the capsule of the optical lens becomes very thin. During the operation, it can rupture, which complicates the implantation .

In people with diabetes, blood sugar levels are constantly changing. To avoid complications during the surgical intervention, as well as during the rehabilitation period, it is necessary to normalize it. At least 2 weeks before the proposed procedure, a clinical blood test is taken, drugs are prescribed to reduce alarming indicators.

Removal of cataracts is recommended at a blood sugar level of 6.0-8.0. Low values can provoke hemorrhage, regardless of the size of the incision on the surface of the eyeball. The operation is performed on an outpatient basis; a few hours after its completion, the patient can go home accompanied by loved ones. Before the procedure, the patient should take hypoglycemic drugs in the form of tablets or inject insulin in his usual dosage. After that, you need to have breakfast to avoid hypoglycemia.

Mature and overripe cases require increased ultrasound energy, respectively, more stress on the eye tissue. In diabetes, the eye tissues and blood vessels are very weak, so it is undesirable to increase the load. Also, with a mature cataract, the capsule of the lens becomes thinner and the zinc ligaments weaken. This increases the risk of capsule rupture during surgery and complicates the implantation of an artificial lens. The outcome is determined by the stage of diabetic cataract. In case of timely treatment of the disease at the stage of initial opacities, their complete resorption is possible. With a mature cataract, the lost functions can be restored only through surgical intervention.

Specific prophylaxis has not been developed. Non-specific preventive measures are reduced to control of blood glucose levels, adherence to a special diet, preventive examination by an ophthalmologist once a year with mandatory biomicroscopy and ophthalmoscopy.

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