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Diabetes: The Eyes Have It

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Diabetes is a metabolic disorder, affecting the way the body processes carbohydrates. Diabetics should, however, know that an eye doctor is a crucial member of their treatment team.

Eye disorders—diabetic retinopathy, glaucoma, cataracts and macular edema—are among the most serious complications of diabetes and a leading cause of blindness with over 5000 cases each year in the United States.

For both type 1 and type 2 diabetics, the American Diabetes Association recommends dilated eye examinations at least once a year and more frequently for patients diagnosed with eye problems. Studies indicate, unfortunately, that only about half of patients follow that recommendation.

The eye is a target for diabetic complications primarily because of the damage high blood sugar can cause to blood vessels. Damage to the tiny blood vessels in the eye can occur about four to seven years after diagnosis of type 1 diabetes and may already be occurring in the eyes of a person newly diagnosed with type 2 diabetes. A recent study found evidence of diabetic retinopathy in eight percent of pre-diabetics, persons with impaired glucose tolerance but not enough to qualify for a diabetes diagnosis.

According to ophthalmologist Ronald Klein, M.D., writing in the *Archives of Ophthalmology*, diabetic eye disease is often an indication that abnormalities are occurring in other blood vessels of the body, including the kidneys, heart and brain. He recommends referral of patients to a cardiovascular specialist as soon as the first signs of diabetic eye disease are observed.

Klein's data from the Wisconsin Epidemiologic Study of Diabetic Retinopathy indicated that diabetic eye problems are predictors of a risk of death from all causes as much as 16 years in the future.

DIABETIC RETINOPATHY: The most common eye complication affects the retina, the lining on the inside surface of the eye that receives and processes visual information and passes it on to the brain.

Once blood enters through the retinal artery, it branches into smaller and smaller vessels across the surface of the retina.

The earliest or mildest effect of diabetes, known as background (or non-proliferative) retinopathy

occurs in some patients even before diabetes is diagnosed. On examination, the eye doctor sees irregularity in these small vessels and some mild blockages.

Microaneurysms (or small, dilated blood vessels) may appear as red dots, and some of these are likely to leak clear fluid into the retina. The leaking in turn results in swelling of the retina and the formation of white deposits or exudates. At this stage the patient notices nothing until the disease is detected on an eye examination.

Background retinopathy indicates to the doctor that diabetes is beginning to damage the blood vessels of the eye. Again, the patient has no idea this is occurring and most rely on the results of a thorough eye exam.

DIABETIC MACULAR EDEMA: The macula is the central part of the retina that is critical to the eye's ability to form sharp, detailed images. When clear fluid leaks from damaged blood vessels and causes edema (swelling) of this part of the retina, the result is severe blurring of vision and potentially more serious problems.

PROLIFERATIVE DIABETIC RETINOPATHY: Only a small number of diabetics develop this severe form of retinopathy.

When blockages in the small blood vessels of the retina become severe enough, the retina produces a chemical that triggers the growth of new blood vessels. These new blood vessels are fragile, often growing out of the surface of the retina into the jelly-like vitreous that fills the eye. When they break open, they produce hemorrhages that interfere with vision and can cause serious damage to the eye, including detachment of the retina.

FLUCTUATION OF VISION: When blood sugar levels are high enough (usually over 300), the lens of the eye can swell and cause progressively blurry vision until blood sugar is brought under control. This condition may require several temporary eyeglass prescriptions in order to allow the patient to carry out daily activities.

CATARACTS: A cataract is a clouding of the usually clear lens inside the eye. Diabetics are more likely than others to get cataracts, and cataracts associated with diabetes are more rapid to develop and often have more severe symptoms.

GLAUCOMA: Diabetes also increases the risk of glaucoma, a disorder involving increased pressure within the eye that damages the optic nerve and threatens vision. One form of glaucoma occurs in conjunction with proliferative retinopathy.

Even the most serious of these problems can be treated. For retinopathy or macular edema, a doctor

can use a laser to seal off leaking blood vessels and inhibit the formation of new blood vessels. In some cases, microsurgery is needed to repair a detached retina or replace the vitreous with a clear fluid.

Early detection, however, is crucial. Without treatment, about half of patients with proliferative retinopathy will become blind within five years while only five percent of those getting laser treatment will lose their vision.

Symptoms noticeable to the patient rarely appear until the disease is advanced, so it's crucial to get an eye examination at least once a year. To properly detect abnormalities, a specialist must conduct these while the eye is dilated.

Like other complications of diabetes, eye disorders are a consequence of high glucose levels in the blood over a period of time. The Diabetes Control and Complications Trial and other studies have demonstrated that treatment that focuses on tight control of blood sugar can delay the onset and reduce the severity of these problems.

Other studies have shown that high blood pressure and high cholesterol increase the risk. According to one study, type 2 diabetics with systolic blood pressure of 140 and over develop retinopathy earlier and have more severe problems.

Whatever the diabetic treatment plan, it's important to follow it carefully, focusing particularly on control of blood sugar, blood pressure and cholesterol. Take your medicines as prescribed, maintain a healthy weight, quit smoking and get regular exercise.

The potential complications of diabetes are numerous, and most are associated with the damage the disease can cause to blood vessels, large and small, throughout the body. A look by a specialist inside your eye may be an early way of heading off problems in your eyes and throughout your body.

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