The Toll Diabetes Takes on Your Eyes

Successful diabetes management means protecting your vision.

If you or someone close to you are among the more than 14 million Americans who have been diagnosed with diabetes (it is estimated that there are another six million diabetics who are unaware that they have the disease), you know that along with that diagnosis come dietary changes, blood glucose monitoring and perhaps daily doses of insulin. What you may not know is that people who suffer from this condition have to protect themselves from developing a host of related ailments. Because diabetes changes the way the cells of your body process sugar, the disease can affect many parts of the system, including your eyes.

Diabetic retinopathy is a general term for all retinal disorders caused by diabetes. One of the most common complications of diabetes, diabetic retinopathy is a leading cause of blindness in the United States. The National Eye Institute estimates that as many as 24,000 diabetic patients become blind every year from retinal complications. Furthermore, diabetics are between 20 and 25 times more likely to lose their sight than non-diabetics. Diabetic retinopathy can occur at any age and with no symptoms at all, but in nine out of 10 cases, blindness due to retinopathy can be prevented if it is detected and treated early enough.

Everyone who has diabetes, either Type I or Type II, is at risk for developing diabetic retinopathy. In general, the longer a person has diabetes, the greater the chances are that he or she will eventually develop retinopathy. According to the National Eye Institute, between 40 to 45 percent of Americans diagnosed with diabetes have some stage of diabetic retinopathy.

Individuals who suffer from diabetes need to be particularly careful with their eyesight. Regular eye exams are essential in the prevention of retinopathy.

HOW DIABETIC RETINOPATHY DOES ITS DAMAGE

Diabetes interferes with the body's ability to use and store sugar. The inability of the body to process sugar leads to high levels of it in the blood, which causes damage to the blood vessels. These vascular system alterations may produce microaneurysms, hemorrhages and fluid leakage into the tissues of the eyes, especially the retina.

The retina is the thin, light-sensitive membrane lining the inner eyeball and connected by the optic nerve to the brain. When light enters the eye, the retina absorbs the light and sends electrical signals along the optic nerve to the brain. Thus, visual impairment can result from a malfunctioning retina if the eye cannot communicate with the brain, which is often the final consequence of diabetic retinopathy.

There are two stages of diabetic retinopathy: background or nonproliferative, and proliferative. Nonproliferative retinopathy is the more common form. The blood vessels that lie on the surface of the retina and supply it with nutrients become impaired, usually affecting both eyes at the same time. With accumulating damage, the blood vessels form tiny pouches in their walls called microaneurysms. The capillary walls may become so damaged that they begin to leak fluid, causing deposits (called exudates) to attach to the retina, or leak blood, leading to hemorrhages. This can prompt the retina to swell, which by itself rarely affects vision. However, if the swelling involves the macula (the part of the eye responsible for seeing fine details) eyesight may be diminished. This condition, known as macular edema, causes a gradual blurring of the vision and hampers such activities as reading or driving.

Proliferative retinopathy is a more serious form of the disease, and is often asymptomatic. At this stage, the blood vessels of the retina become ineffective due to exudates and leakage. New blood vessels grow – a phenomenon known as neovascularization – in an attempt to replace the useless ones. However, these new blood vessels are fragile and often rupture, leaking blood into the vitreous, the clear liquid that fills the center of the eye.

This vitreous hemorrhaging may cause vision to become spotty, hazy or totally obscured due to the leaked blood blocking light from reaching the retina. Sometimes peripheral vision is reduced and the ability to see at night or to adjust from light to dark is diminished. Hemorrhages may or may not clear up on their own. As a separate difficulty, scar tissue sometimes forms as a result of the faulty new blood vessels, pulling the retina out of position. This condition, called retinal detachment, causes a loss of sight as well.

RETINOPATHY PROBLEM PREVENTION

There are an estimated 63,000 new cases of proliferative diabetic retinopathy and 80,000 new cases of diabetic macular edema each year. When there are symptoms of retinopathy, they may present themselves as a change in prescription, blurred or cloudy vision, distorted vision, double vision, an area or areas without vision or shadowy vision. One day vision may be perfectly clear and the next it might be blurry, which is caused by the retina's absorption of leaking fluid. When the retina cannot absorb the fluid fast enough, fat and protein particles are deposited in the retina. This, in turn, results in a fluctuation in vision. However, not everyone with retinopathy experiences this, nor do they necessarily realize it is a symptom of a serious vision problem. Most of the time, retinopathy can progress a long way without any warning signs.

PREVENTION

It is essential to visit an eye care professional for a full examination on a regular basis, even if you are not diabetic. For a significant percentage of those with diabetes, their disorder is first diagnosed when their eye doctor discovers signs of retinopathy. A comprehensive eye examination includes a visual acuity test with an eye chart, opthalmoscopy to magnify the view of the retina, tonometry to measure fluid pressure within the eye, and the extremely important dilated fundus evaluation.

A dilated fundus evaluation, in which the pupils are expanded with eye drops, allows the eye doctor to get a broader view inside the eye to better examine its structures and look for evidence of disease. Checks for leaking blood vessels, retinal swelling, fatty deposits on

the retina, damaged nerve tissue and any changes to the structure of the blood vessels are performed. If your doctor suspects retinopathy, fluorescein angiography, during which dye is injected into your arm, may be performed. The dye travels to the blood vessels in the retina, allowing your doctor to see which vessels are faulty. If retinopathy is detected and treated early, there is a good chance that blindness may be prevented.

People with Type I diabetes above the age of 10 should have a comprehensive eye examination soon after the diagnosis was made, and yearly follow-ups thereafter. Those with Type II diabetes should have their initial comprehensive eye examination as soon as possible after the onset of the disease, with follow-ups at least once a year. It is important to adhere to the advice of your eye care professional on how frequently check-ups are needed. If retinopathy is moderate to severe, or if you have additional risk factors, visits may be recommended as often as every three to six months. It is also essential to take any oral medications and eye drops prescribed by your doctor exactly as instructed.

RISK MANAGEMENT

A critical factor in the development of retinopathy is how well a person controls his or her diabetes. Comprehensive studies have shown that when blood sugar levels are rigorously maintained near normal levels, the onset of retinopathy is delayed and the progression of the disease is slowed. The 10-year-long Diabetes Control and Complications Trial conducted by the National Institute of Diabetes and Digestive and Kidney Diseases revealed that strict management of blood sugar levels reduced the risk for developing retinopathy by 76 percent. In participants who showed signs of retinopathy before the study began, intensive management slowed the progression of the disease by 54 percent.

According to information from the American Diabetes Association, men develop retinopathy more frequently than women, and Native Americans, African Americans and Mexican Americans have a higher risk than European Americans. Moreover, diabetics with kidney disease have twice the risk of developing retinopathy as those with healthy kidneys. Additional risk factors for retinopathy include smoking, high blood pressure, alcohol consumption and pregnancy. Pregnant women and those planning a pregnancy are advised to visit with their eye care professional for dilated fundus evaluations prior to conception and during each trimester.

If proliferative retinopathy is present, exercise can be harmful to the vision until treatment has stabilized the problem. Strenuous exercise can increase the risk of blood vessel breakage. While exercise is an important means to help keep blood sugar levels normal, it is essential to get the approval of your doctors before resuming a fitness regimen. Even when high-impact sports are ruled out, activities such as walking, bicycle riding and swimming may be permitted.

Diabetic retinopathy may be the most prevalent disease of the eyes for diabetics, but the risk for other conditions is increased as well. People with diabetes are nearly twice as likely to develop cataracts and glaucoma as those without diabetes. These are two additional important reasons to make sure you see an eye care professional at least once a year.

SURGICAL SOLUTIONS

Although it is not curable, diabetic retinopathy can often be treated. Even when the damage to the eyes is fairly advanced, 90 percent of those receiving timely treatment can retain weak sight. A type of laser surgery called photocoagulation frequently is quite successful for those with moderate to severe retinopathy. The laser can seal the leaking blood vessels and stabilize macular edema. However, many people need to have laser surgery repeated several times to keep the leaking fluid under control.

The laser can also be aimed at hundreds of spots all across the retina to destroy the abnormal blood vessels that grow when proliferative retinopathy is present. Peripheral, color or night vision may be reduced after surgery from widespread laser treatment, but the majority of sight can be saved. In cases of macular edema, timely laser surgery can reduce vision loss by half.

When there has been a vitreous hemorrhage, a surgical procedure called a vitrectomy is sometimes performed. The gel-like vitreous is removed and replaced with a clear salt solution. This surgery may restore vision partially or completely.

Lasers offer significant advantages in many types of eye surgery. The high-energy light beam can be focused precisely on the smallest of structures. Even if vision cannot be improved, laser surgery may help to limit visual loss and minimize damage that would have occurred without treatment. However, while laser surgery may be very successful in arresting the progress of retinopathy, the benefit may be partial or only temporary, and laser surgery usually cannot restore vision already lost.

Diabetic retinopathy can be a devastating disease. Fortunately, when caught early, it is a condition that can be managed successfully through competent care by an eye doctor.