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Diabetic Retinopathy Disease

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Abstract---Introduction: Diabetic Retinopathy is an eye disease that can cause loss of vision and vision in people with diabetes. Diabetic retinopathy occurs when high blood sugar levels affect the blood vessels in the retina. Nonproliferative diabetic retinopathy (NPDR) and proliferative diabetic retinopathy (PDR) are two types of diabetic retinopathy (PDR). Blood sugar levels may be controlled to control NPDR. PDR is a very serious condition that affects the middle view. Diabetes retinopathy is diagnosed using dilated eye scan, fluorescein angiography, and optical coherence tomography. Laser treatments, eye injections, and surgery are also used to treat the onset of diabetes. To prevent new blood vessels from growing behind the eyes, injections of vascular endothelial cell factor inhibitors are injected directly into the eyes. Aim: Diabetic retinopathy disease. Conclusion: Diabetic retinopathy is a permanent condition. Laser analysis (photocoagulation) is normally very helpful at avoiding vision damage when performed before the eye is damaged. If the eye is not badly affected, surgical removal of the vitreous gel will increase vision (vitrectomy). An anti-inflammatory or anti-vascular endothelial growth factor injection may help create new blood vessels in some cases of chronic diabetes.

Keywords---diabetic retinopathy, eye examination, fluorescein angiography, maculopathy, non proliferative, proliferative diabetic retinopathy, VEGF, vitreoretinal surgery.

Introduction

Diabetes retinopathy is an eye disorder that can cause vision loss and blindness in diabetics. Diabetic retinopathy is a typical form of diabetes that scares many diabetic patients. There is still a possibility, despite the hazards and signs of diabetes and the onset of diabetes. 1 Diabetic retinopathy should be tested to guarantee that it is diagnosed and treated as soon as possible. It effects the blood vessels in the retina. Diabetic retinopathy occurs when elevated blood sugar levels affect the blood vessels in the retina. Inflammation and leaking are common in these blood vessels. They will even shut down to stop the supply of blood. New irregular blood vessels may develop in the retina (2).

In the elderly, diabetes retinopathy is the main cause of blindness. Including the fact that a number of metabolic abnormalities have been linked to the progression of diabetic retinopathy, owing to the multifaceted existence of the condition, the connection between some specific abnormality and diabetic retinopathy is still commonly debated.³ Diabetes retinopathy remains the leading cause of blindness among working-age Americans, despite the fact that early detection and care may decrease the chance of irreversible vision loss. Low test requirements are to blame for this (4,5).

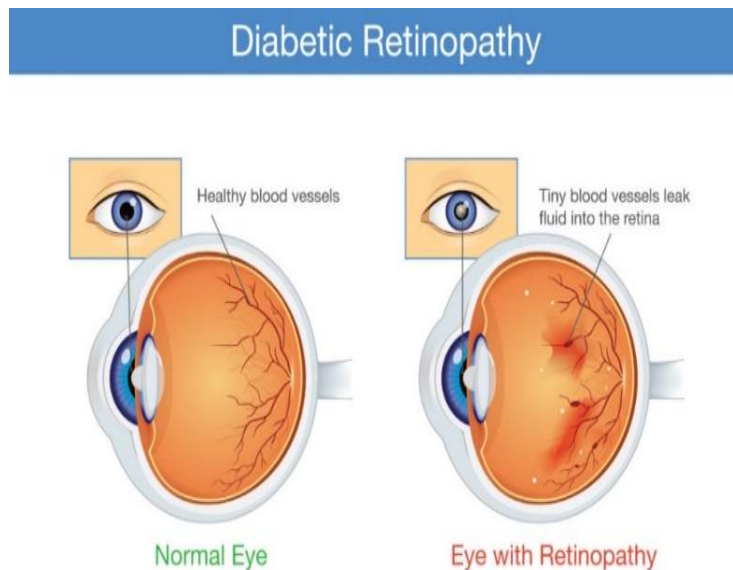


Figure 1. Diabetic retinopathy

Symptoms

The symptoms are normally visible after the condition has progressed. Diabetic retinopathy usually affects both eyes. The below are some of the disease's signs and symptoms (6).

- *Distorted vision*
- *Eye floaters, which are*

Translucent spots and Dark strings that float in a person's field of vision and pass in the direction in which the person looks.

Stages of Diabetic Eye Disease

NPDR- This is the beginning of diabetes mellitus. It affects a significant number of diabetics. Instead of NPDR, the tiny blood vessels in the eye leak, allowing the retina to swell. When the macula swells, macular edema develops. In people with diabetes, which is the most common cause of vision loss? NPDR may also cause blood vessels in the eye to become blocked. The medical name for this disease is macular ischemia. When this occurs, blood cannot reach the macula. Exudates, which are microscopic particles, will accumulate in the retina over time. This will have an effect on your perspective. If you have NPDR, the theory would be perplexing.

PDR (proliferative diabetic retinopathy)

PDR has developed as a result of diabetic eye disease. When the eye starts to develop new blood vessels, this happens. Neovascularization is the term for this method. The vitreous also bleeds from these fresh, fragile vessels. If they bleed a bit, you could see a few dark floaters. Their vision will be totally blurred if they bleed profusely. As a result of the new blood vessels, scar tissue can form. Scar tissue may block the macula or cause the retina to separate. PDR may steal both central and peripheral vision.

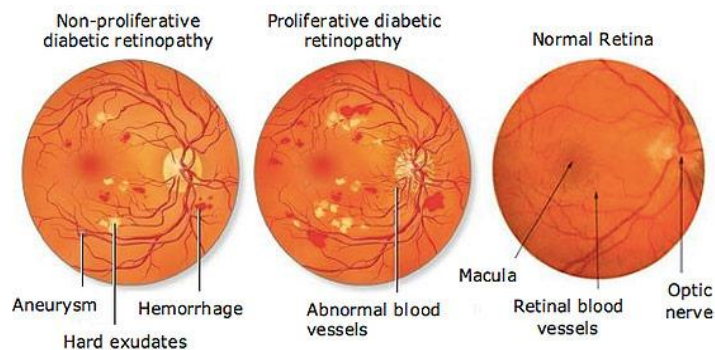


Figure 2. proliferative diabetic retinopathy

Risk factors

- DM
- HTN
- Hypercholesterolemia
- Heavy Smoker

Diagnosis

- Dilated eye exam- For a dilated eye examination, an eye doctor inserts drops into the patient's eyes. These drops dilate the pupils of the eyes, allowing the doctor to examine the inside of the eye. They'll take a photo of the interior of the eye and see if there's anything there: abnormalities in the blood vessels, optic nerve, or retina

- cataracts
- changes in eye pressure
- new blood vessels
- retinal detachment
- scar tissue

The combination of these eye drops and the bright lighting in the pictures will make you feel uncomfortable. In high-risk people, the eye drops may cause a rise in ocular pressure.

- Fluorescein angiography- To perform fluorescein angiography, an ophthalmologist opens the eyes with drops before applying fluorescein dye to a person's arm. They will then take pictures of the pigment as it passes through the eyes. The dye will penetrate the retina or lubricate it if the blood vessels are abnormal. These tests will help doctors determine which blood vessels are leaking, spilled, or blocked. This understanding means that all laser treatments are well completed. It is common for a drug injection into the eye to be needed. People can see yellow skin or dark orange urine one or two days after the dye leaves the body.
- Optical coherence tomography (OCT) - An image scanner that provides non-invasive images of the upper retina, shows its size, and allows optometrists to detect cysts or inflammation. Physicians can use pre- and post-surgery scans to evaluate the effectiveness of a drug. Ultrasound scanning is similar to OCT scanning, but OCT emits more light than sound. Scanning can help detect optical nerve disturbances.
- Treatment for Diabetic Retinopathy: The aim of therapy is to slow or avoid the progression of diabetic retinopathy, which can take a variety of forms and degrees of severity.

Early diabetes retinopathy

If you have non-progressive to mild diinetic retinopathy, you do not need treatment. On the other hand, your optometrist will examine your eye carefully to see if you need treatment. If diabetic retinopathy is mild to moderate, proper blood sugar regulation can usually prevent it from progressing.

Advanced Diabetes Retinopathy - For diabetic retinopathy that threatens or affects your vision, the main treatment options are:

- Laser Treatment - Management of the development of new blood vessels after the eye (retina) and the stabilization of certain types of maculopathy in cases of high risk of diabetes. Laser therapy is used to treat new blood vessels behind the eyes in the early stages of diabetic retinopathy. This is because the new blood vessels are too small and cause bleeding in the eye.

- Treatment can help strengthen your vision of diabetes and prevent your vision from deteriorating, but it rarely improves your vision.
- Eye surgery - treatment for acute maculopathy that causes blindness
- Eye surgery - if laser treatment is not possible due to advanced retinopathy, removal of blood or red tissue from the eye
- Potential complications- You should be informed of the risks of treatment in advance. Potential problems include:
 - Some people will have to avoid driving due to night shifts or vision (side).
 - Things that float in your vision or bleed in the eyes (flyers)
 - For a few months, you can "see" the pattern created by the laser behind your eye
 - Slightly, but always a blind eye in the center of your vision

Eye injections

In some cases of diabetic maculopathy, anti-VEGF (vascular endothelial growth factor inhibitors) injections should be given directly to the eyes to prevent new blood vessels from growing behind the eyes. The most widely used drugs are Avastin (bevacizumab), Eylea and Zaltrap (aflibercept), and Lucentis (ranibizumab). This will help keep your eyeballs at bay and improve your vision. During treatment:

- The skin around your eyes will be cleansed and covered with a sheet
- Small clips will be used to keep your eyes open
- You will be given local anesthetics to release your eyes
- An excellent needle is carefully directed to your heart and injected

Risks and side effects

Potential risks and side effects of anti-VEGF injections include:

- Eye irritation or discomfort
- Bleeding inside the eye
- Flies or a feeling of having something in your eye
- Watery or dry, itchy eyes

Blood clots can form as a result of injections, which can lead to a heart attack or stroke. Although this is a small risk, it should be considered before accepting treatment. The most serious side effect of steroid injections is an increase in intraocular pressure.

Eye surgery

Surgical removal of any vitreous lesions of the eye is possible. This is a clear, gel-like substance that occupies the space between the lens of the eye. If you have any of the following symptoms, vitreoretinal surgery may be required:

- There are many scar tissue that can remove or have already begun retinal detachment.

- The surgeon will make a small hole in the eye to clear the vitreous jaw, red tissue, and use a laser to prevent any vision damage after the procedure. Sedation and local anesthesia are commonly used for vitreoretinal surgery. This means you will not have to worry or know what is going on during the process.

Risks and side effects

Possible risks of vitreoretinal surgery include:

- Developing a cataract
- Further bleeding into the eye
- Retinal detachment
- Fluid build-up in the cornea (outer layer at the front of the eye)
- Infection in the eye

Conclusion

Diabetes retinopathy is incurable. When done before the eye is injured, laser analysis (photocoagulation) is usually very effective in preventing vision loss. Surgical removal of vitreous gel will improve vision if the retina is not severely damaged (vitrectomy). In some cases of recurrent diabetes, an anti-inflammatory or antivascular endothelial growth factor injection can help build new blood vessels. Since symptoms do not appear until the disease has progressed to the point of death, it is important to diagnose it early with regular tests. Early signs of DR can be seen in non-diabetic retinopathy, and it is important to identify and diagnose DR early. In this DR study, more time is spent looking at bleeding, microaneurysms and exudates, diabetic edema, and new abnormal blood vessels in the fundus cells as indications of the presence of retinopathy. This aids in research in the early diagnosis of retinopathy, which can lead to irreversible vision loss if not treated immediately.

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