Glaucoma — are you at risk?

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Glaucoma is one of the leading causes of blindness in the U.S., affecting 1 to 2 percent of Americans older than age 40.[1] The Glaucoma Research Foundation estimates that more than four million Americans have glaucoma, but only half of them know they have it.[2] It's a chronic syndrome in which the fluid pressure in the eye increases, leading to optic nerve damage, nerve fiber damage and visual field loss. Damage to nerve tissue can be catastrophic because this tissue sends visual information from your eye to your brain. The resulting vision loss can lead to blindness if it is not detected early and treated.

Seeing the effects

Glaucoma has no early symptoms or warning signs. Early stages of glaucoma can advance gradually and can damage nerve cells without any noticeable symptoms. It can only be diagnosed during a comprehensive eye exam by an optometrist or an ophthalmologist. Everyone is at risk for glaucoma, from babies to senior citizens. Glaucoma is usually bilateral and progressive, but may not necessarily progress at the same rate for each eye. Your side vision (peripheral vision) will be lost when glaucoma begins to damage the optic nerve. Glaucoma is a "silent" condition because you may not be aware that you have a problem until there is a large loss of your visual field. If the disease progresses, it could effect your central vision and lead to blindness. There is no cure for glaucoma, and vision already lost to glaucoma cannot be restored. Early detection is crucial in order to treat and control it.

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How it happens

Your inner eye produces a clear watery fluid called the aqueous humor which nourishes the eye. It exits the eye through a mesh-like pathway and enters the bloodstream. If the pathway becomes clogged or is damaged due to age, there can be an abnormal buildup of fluid. As the amount of aqueous fluid increases inside the eyeball, the pressure in the eye builds up. There needs to be a balance between the fluids produced by the eye and the fluids exiting the eye. (The fluid that is in the eye is different than your tears.)

The pressure needed to cause optic nerve damage varies from person to person. The adequacy of the blood supply to the optic nerve affects how each nerve responds to a particular pressure. Not everyone with high intraocular, or eye, pressure will necessarily develop glaucoma, and some people with normal pressure may develop glaucoma.

If a person has high eye pressure without damage to the optic nerve and without a visual field loss, he or she has a condition called ocular hypertension. This can lead to glaucoma if it is not monitored and controlled.

There are different types of glaucoma:

1. Chronic open-angle glaucoma — This is the most common form of glaucoma. In this type, the aqueous fluid drains too slowly and pressure in the eye builds up. It develops slowly and without symptoms.

2. Normal tension glaucoma — A form of open-angle glaucoma, this variation is not related to high pressure. In this type, the optic nerve becomes damaged even though the person has a pressure within the normal range. These people are unusually sensitive to normal pressure. This could be due to a reduced blood supply to the optic nerve.

3. Acute angle-closure glaucoma — This contributes to less than 10% of glaucoma cases. It occurs when the drainage angle of the eye closes or becomes blocked. This causes a sudden rise in pressure that requires emergency medical care. This condition can cause a loss of vision in one day. The signs of this condition include pain, red eye, reduced vision, halos around lights, headaches, nausea and vomiting.

4. Secondary glaucoma — 10% of glaucoma cases that are secondary to other diseases may cause damage to the drainage system. These conditions include arthritis, cataracts, diabetes, sickle-cell anemia and steroid use.

Risk factors for developing glaucoma:

- A family history of glaucoma
- High eye pressure — this is the only risk factor that can be treated.
- Everyone older than age 60 is at a higher risk, especially those of Hispanic descent.[1]
- People of African descent have a 4 to 5 times greater risk of developing glaucoma than Caucasians, with the onset occurring at an earlier age.[3] They also don't respond to treatment as well as Caucasians and the consequences are more severe.

- People of Asian descent are at a higher risk for angle-closure glaucoma.
- Those with chronic eye inflammations or a history of trauma to the eye.
- People with thinner corneas are at a higher risk of developing glaucoma.
- The use of steroid medications can lead to glaucoma.
- Those with systemic conditions such as diabetes, hypertension and heart disease are at an increased risk of developing glaucoma.

Diagnosing glaucoma

Glaucoma can only be diagnosed during a routine comprehensive eye examination. Your optometrist or ophthalmologist will check the intraocular pressure, evaluate your optic nerve and look for visual field loss. These tests are painless and are easily performed.

- Your doctor will use an ophthalmoscope to look through the pupil of your eye to directly view your retina and optic nerve.
- He or she will look at the shape and color of the optic nerve. If the optic nerve appears to be abnormal or unhealthy, additional tests will be run.
- Tonometry will be performed to measure the pressure in the eye. The average pressure inside the eye is about 16 mm Hg. If the reading is above 21 mm Hg, your doctor may want to perform additional tests.
- Your doctor will perform a confrontation visual field test to look for loss of side vision.
- If your doctor suspects that there is a loss of side vision or that there is damage to your optic nerve, an automated visual field test is required. This test is not part of routine eye care, but may be covered under your medical insurance.

Other tests that may be necessary if your doctor suspects glaucoma:

- Pachymetry measures the corneal thickness.
- Gonioscopy allows the doctor to examine the drainage system of your eye.
- Stereoscopic fundus photography is useful to evaluate the optic nerve and retina.
- Serial tonometry allows the doctor to check the intraocular pressure at different times of the day and on different days — the pressure does fluctuate.
- A computerized optic nerve scan may be required to measure the thickness of the optic nerve fiber layer and to look for damage.

If it is determined after all the glaucoma tests that therapy is not needed, you may still be classified as a glaucoma suspect. You may need to follow up with your eye doctor once or twice a year to evaluate your eye pressure. Glaucoma cannot be prevented or cured, but if it is diagnosed and treated early, it can be controlled.

How is it treated?

Glaucoma treatment involves reducing the pressure in the eye. Treatment options include medication, laser surgery, glaucoma surgery or a combination of treatments. Medical therapy is the most common method for treating glaucoma. Glaucoma medications are usually in the form of drops. The drops either decrease the amount of fluid produced or improve the fluid drainage out of the eye. Keeping the eye pressure under control will decrease the risk of optic nerve and nerve fiber damage. As with all medications, there can be side effects. If you are taking drops for glaucoma and are experiencing problems, be sure to contact your eye doctor immediately.

Some patients may require laser surgery to treat their glaucoma. This procedure only requires numbing eye drops and does not require any cutting. A laser beam is directed into the mesh-like drainage system to enlarge the drainage channel. This increases the flow of aqueous fluid out of the eye in order to decrease pressure. Some patients may still need to use eye drops after this procedure.

Filtration surgery may be necessary if drops and/or laser surgery are not successful in lowering the eye pressure. During this procedure, a new drainage channel is created to allow aqueous fluid to drain from the eye. In this procedure, the surgeon cuts a small opening in the white part of the eye (sclera) to allow fluid to leave the eye.

Angle-closure glaucoma is a medical emergency. Several medications can be used to reduce the pressure as quickly as possible. Most likely, a laser beam will be used to create a tiny hole in the iris. This opens up the drainage angle so that aqueous fluid can escape.

Everyone should have a routine comprehensive eye exam that tests for glaucoma and other eye disorders. You can also help protect the vision of family members and friends, who may be at high risk for glaucoma, by encouraging them to practice routine eye care. Since there is no cure, medical therapy will be a lifelong commitment. Most glaucoma patients should be evaluated every three to four months for monitoring of intraocular pressure, optic nerve status and vision loss. Even with eye drops or surgery, you may still experience vision loss. With early detection and treatment, glaucoma can often be controlled and vision preserved.

Sources:

[1] www.aoa.org/Glaucoma.xml

[2] www.glaucoma.org/learn/glaucoma

[3] www.preventblindness.org

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