

Glaucoma

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Definition

Glaucoma is a specific pattern of optic nerve damage and loss of vision caused by a number of different eye disease that can affect the eye.

Introduction

Glaucoma is a family of eye disease, characterized by increasing pressure within the eye, resulting in the loss of vision.

The loss of vision caused by glaucoma is irreversible; however, medication or surgery can control the pressure and slow or stop the progression of the disease. If the disease is diagnosed in its early stages, it can be treated effectively.

Glaucoma usually strikes without obvious symptoms. Therefore, the person with glaucoma is usually unaware of it until serious loss of vision has occurred. In fact, half of those suffering damage from glaucoma do not know it.

Glaucoma occurs in two main varieties known as chronic simple and acute glaucoma. In chronic simple glaucoma, pressure within the eye rises gradually and vision loss progresses over a period of years. In acute glaucoma, the pressure inside the eye rises suddenly and immediate medical treatment is necessary to preserve vision. Acute glaucoma is also known as narrow-angle or angle-closure glaucoma, because the angle between the cornea (the transparent layer of tissue at the front of the eye) and the iris (the colored part of the eye) becomes smaller than normal. Chronic simple glaucoma is also known as open-angle glaucoma because the angle between the cornea and iris remains normal.

Worldwide, approximately 5.2 million people are blind due to glaucoma, making this condition the third leading cause of blindness. More than 50,000 people in the United States alone have lost significant vision due to glaucoma, and the condition is the leading cause of preventable blindness in the nation. More than two million people are currently being treated for glaucoma, and an estimated one million additional cases of the disease are undiagnosed.

The front part of the eye is filled with a watery fluid. This fluid helps the eye maintain its shape and delivers oxygen and nutrients to the cornea and the lens, the eye structure that refracts light to form images. A small gland located just behind the lens provides this fluid. The fluid flows through the pupil and circulates through the front chamber of the eye. It then drains away through a network of tiny channels, called the trabecular meshwork, located at the front of the eye where the cornea and iris meet.

When the fluid does not drain properly, it causes the pressure inside the eye to increase, and glaucoma develops. The increased pressure inside the eye compresses and damages the optic nerve, the bundle of nerve cells that transmit visual information from the eye to the brain. This damage to the optic nerve results in vision loss. In chronic simple glaucoma, the fluid drains through the trabecular meshwork more slowly than normal, much as a sink empties more slowly when the drain is clogged.

Everyone should be concerned about glaucoma and its effects. It is important for each of us, from infants to senior citizens, to have our eyes checked regularly, because early detection and treatment of glaucoma are the only way to prevent vision impairment and blindness. There are a few conditions related to this disease, which tend to put some people at greater risk. This may apply to you if:

- you are over 45 and have not had your eyes examined regularly
- someone in your family has a history of glaucoma
- you have abnormally high intraocular pressure
- you are of Asian or African descent
- you have diabetes Note to Rose: link to diabetes
- myopia (nearsighted)
- regular, long-term steroid/cortisone use
- previous eye injury
- certain syndromes such as Sturge Weber or Congenital Rubella Syndrome Note to Rose: link to our sites

Acute glaucoma is most common in Asians and in people who are farsighted. It tends to run in families and can develop at any age. An acute attack can be brought on by entering a darkened room, stress, and certain medications. The pressure inside the eye increases because the iris is suddenly pushed down over the trabecular meshwork, much as a stopper is put in a drain. The pressure increases very rapidly, within a matter of a few hours. Symptoms develop suddenly and include:

- severe headache
- nausea
- sensitivity to light
- redness of the eyes
- blurred vision
- seeing rainbowlike halos around lights

Diagnosis

In its early stages, glaucoma is symptomless. The gradual increase of pressure inside the eye does not cause any pain or discomfort. As the disease progresses, however, vision begins to deteriorate. The deterioration usually begins with the peripheral vision, sight at the outer edges of the visual field. If glaucoma is left untreated, the field of vision continues to shrink until a person becomes blind.

Glaucoma can be detected before vision loss occurs by a tonometry test, which is a simple, painless part of a routine eye exam. An instrument called a tonometer blows a puff of air into the eye to measure the pressure inside the eye. Some tonometers measure pressure by means of a small plastic prism that is pressed lightly against the surface of the eye. Tests to measure peripheral vision help detect vision loss due to glaucoma. Finally, an instrument called an ophthalmoscope permits examination of the inside of the eye to detect damage to the optic nerve.

Treatment

Most cases of glaucoma can be controlled with medication in the form of eyedrops or pills. These medications reduce the pressure inside the eye, either by decreasing the amount of watery fluid produced or by increasing the rate at which the fluid drains from the eye.

When the pressure inside the eye cannot be controlled by medication, surgery may be necessary. In laser surgery, a high-energy laser beam is aimed at the eye to help stretch the trabecular meshwork and make it easier for fluid to flow out of the eye. Sometimes patients who already have had laser surgery develop increased pressure inside the eye again. At that point, conventional surgery is often performed to create a new channel through which fluid can leave the eye. A valve may be surgically implanted in the eye to help control the pressure.

Medications to decrease the production of the watery fluid in the eye and to constrict the pupil are used to treat acute glaucoma. Laser surgery (as above) is also used. A test called gonioscopy can be performed as part of an eye exam to predict a person's chance of having another acute attack.

Emergency Situations – What can go wrong?

In an acute glaucoma attack, the attack can occur within a matter of hours and become very painful. The pressure inside the eye must be lowered within 24 hours to prevent severe vision loss.

What to do:

If you suspect acute glaucoma, go to the emergency room or call the individual's ophthalmologist immediately.

Conclusion

Glaucoma is a serious disease that can result in blindness if left undetected. Certain syndromes associated with developmental disabilities, like Sturge Weber or Congenital Rubella syndrome, are associated with increased risk for glaucoma. A regular eye exam is the most important thing you can do to protect your vision.

The following chart will help you decide how often you should have an eye exam:

	If you have no risk factors for glaucoma	If you have risk factors for glaucoma
Under 45 years old:	Every 4 years	Every 2 years
45 years and older:	Every 2 years	Every year

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