SJIF Impact Factor (2024): 8.675| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 9 | Issue: 11 | November 2024 - Peer Reviewed Journal

TO REVIEW ON STUDY AND TREATMENT OF GLUCOMA

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ABSTRACT

Glaucoma, a progressive optic neuropathy characterized by retinal ganglion cell degeneration and visual field loss, is the leading cause of irreversible blindness worldwide.A leading causes of irreversible blindness.glucoma is a group of eye conditions the progressively damge the optic nerves leading irreversible vision loss a and blindness.glucoma is characterized by increasing introcular pressure(iop) optic nerve damge and visual field loss.primary open angle glucoma (poag)is chronic disease characterized by elveted intravascular and visual field loss.

A chronic progressive eye disease caused by damage to the optic nerve which leads to visuals field loss glucoma is a heterogeneous group disease characterized by capping of the optic nerve to bead and visual field damage .A gernal understand of die pathophysiology the gole treatment with drop larer therapy or surgery is to slow visual field loss by lowering introcular pressure.they are the optic nerve atrophy peripheral visual field loss.their are several type of test and type and glucoma and treatment of present type of glucoma are open angle glucoma closure glucoma congenital glucoma childhood glucoma and secondary glucoma present

INTRODUCTION

Glaucoma is the leading cause of irreversible blindness world-wide and is the second most common cause of bilateral blindness after cataract. Glaucoma represents a group of diseases defined by a characteristic optic neuropathy and is associated with the development of distinctive patterns of visual dysfunction.

The optic neuropathy is characterized by excavation, deepening, and undermining of the neural and connective tissue elements of the optic nerve head. Visual field defects typically begin in the midperipheral field and eventually involve the central field.

Although elevated intraocular pressure (IOP) is a major risk factor, its presence or absence does not have a role in the definition of the disease. It is, however, the only modifiable risk factor, and lowering the IOP is the only proven intervention for the preservation of vision in glaucoma.

In individuals who are susceptible to glaucoma "normal" IOP may be defined as a pressure that does not lead to optic nerve damage.

Unfortunately, precise numerical values are not clear because individuals show susceptibility to optic nerve damage at different pressure levels.

The Early Manifest Glaucoma Trial identified predictive baseline factors of progression in glaucomatous patients.

Besides higher IOP at baseline, other factors included exfoliation syndrome, bilaterality, worse baseline visual field mean deviation, older age, and disc hemorrhages at follow- up visits. These findings indicate that IOP control alone is not enough to stop glaucoma progression in certain eyes and non- IOP related risk factors may contribute to neuronal loss in glaucoma.

The cardinal event In glaucoma is injury to the axons of retinal ganglion cells (RGCs) that results in characteristic optic nerve head cupping. 184 RGC death in glaucoma may be mediated by direct insults to RGCs, such as oxidative stress and neurotrophic factor deprivation, and by indirect pro inflammatory effects caused by other retinal cells, such as microglia and astrocytes.

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OBJECTIVE

1.Glaucoma patient can live full lives.
2.The ultimate goal of glaucoma therapy is maintain vision.
3.Detecting changes in the disease progress.
4.Avoiding future vision loss are the goal of this study of glaucoma apotentially blinding condition.

PLAN OF WORK

1. Section of topic.
2. Study of literature review.
3. Study of history of glaucoma.
4. Study of pathophysiology of glaucoma.
5. Study of sign and symptom of glaucoma.
6. To determine diagnosis and treatment of glaucoma.

HISTORY OF GLAUCOMA

Glaucoma has been known in medicine since Antiquity. Hippokrates described "glaykoseis" as blindness which occurs in the elderly. The English ophthalmologist Banister was the first to establish the connection between increased tension of the eyeball and glaucoma.

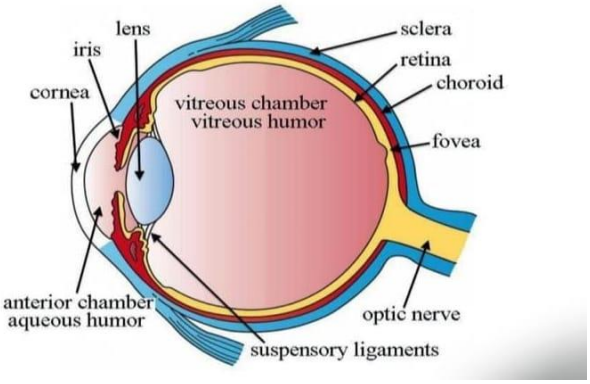
The important invention of the ophthalmoscope by von Helmholtz (1850) made it possible to diagnose glaucomatous changes in the fundus. in 1862, Donders discovered that high intraocular pressure caused blindness and called the disease "Glaukoma simplex." Further progress in the diagnosis of glaucoma was made by the invention of the tonometer and the perimeter, and the use of cocain. The first effective surgical treatment of glaucoma, an iridectomy, was carried out by von Graefe in 1856.

PATHOPHYSIOLOGY

Elevated intraocular pressure and low perfusion pressure increase the gradient across the lamina cribrosa and cause papillary hypoperfusion, leading to structural changes and remodeling of the lamina cribrosa and to impaired axonal transport in the optic nerve fibers.

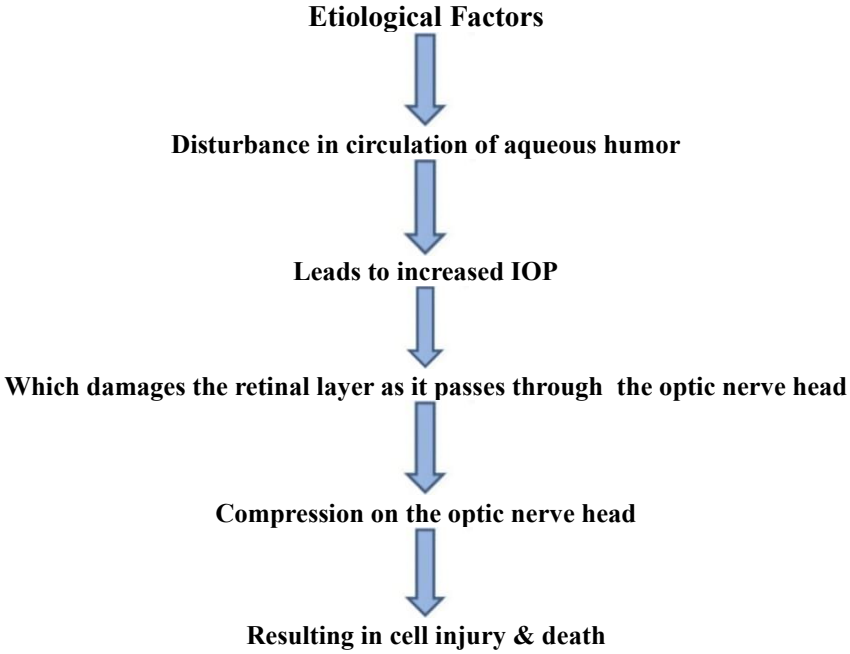
The retinal ganglion cells are neurons of the central nervous system that receive signals from the photoreceptors, process them, and transmit them in axons through the optic nerve to further centers in the brain. These axons run from the ganglion cell nuclei in the retina to the

optic disc, and then together with the retinal vessels through the lamina cribrosa, a sieve-like structure composed of collagen. Behind the lamina cribrosa, the axons, surrounded by a myelin sheath, continue as the optic nerve. Elevated intraocular pressure, low perfusion pressure, and/or low cerebrospinal fluid pressure increase the gradient across the lamina cribrosa and cause papillary hypoperfusion, leading to structural changes and remodeling of the lamina cribrosa and to impaired axonal transport in the optic nerve fibers.



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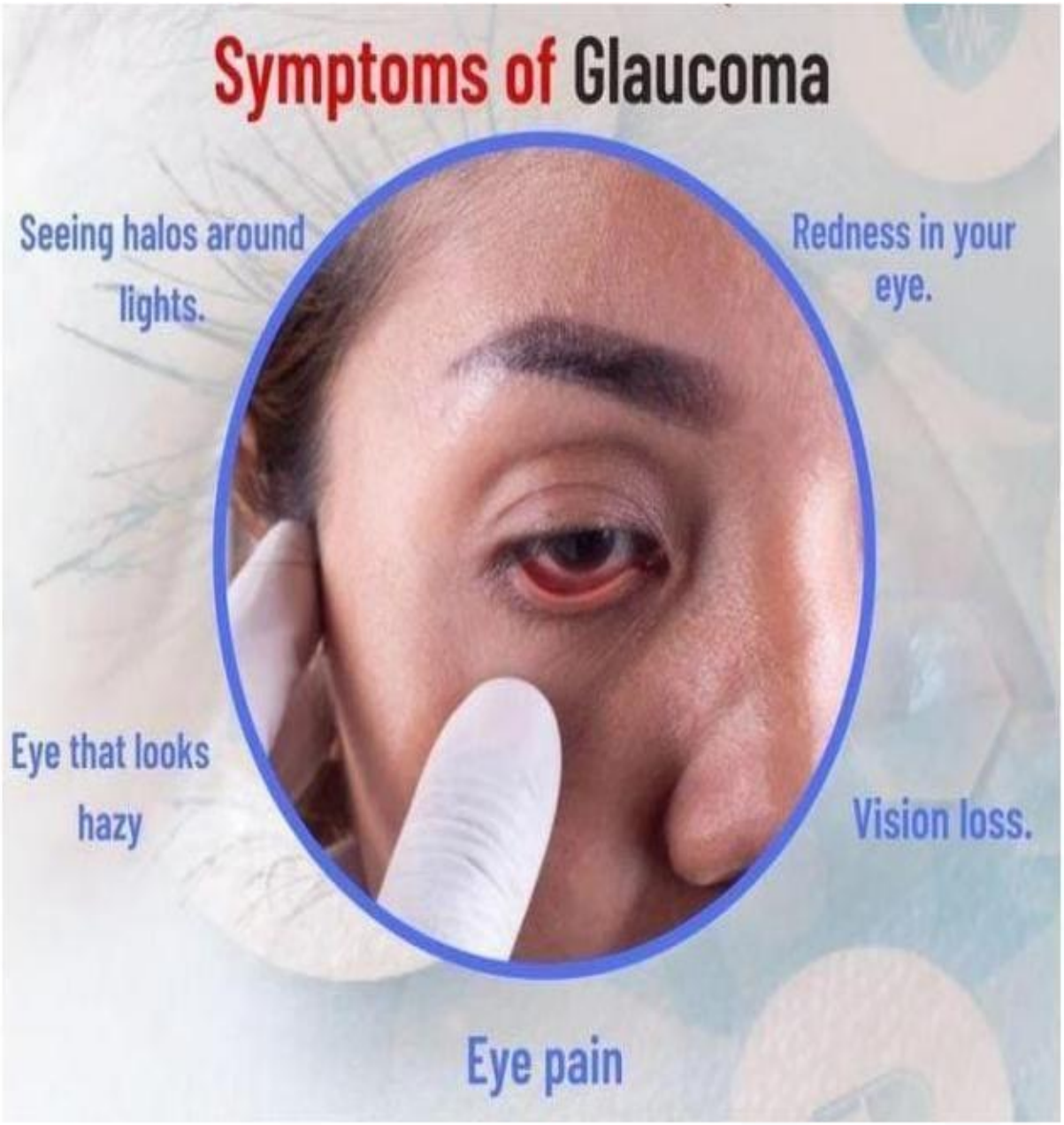
PATHOPHYSIOLOGY



SYMPTOMS

- The symptoms of glaucoma depend on the type and stage of your condition.
- Open-angle glaucoma
- No symptoms in early stages Gradually, patchy blind spots in your side vision. Side vision also is known as peripheral vision. In later stages, difficulty seeing things in your central vision.
- Glaucoma in children
- A dull or cloudy eye [infants] Increased blinking [infants]
- Acute angle closure Glaucoma
- Severe headache
- Nausea
- Vomiting Blurred
- Vision
- Halos or Colored rings Around lights eye redness
- Normal-tension glaucoma
- No symptoms in early stages gradually, blurred vision.
- In later stages loss of side vision tears without crying [infants] blurred vision. Nearsightedness that gets worse headache.
- Pigmentary glaucoma
- Halos around lights Blurred vision with exercise Gradual loss of side vision.

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- **CAUSES**

• Open-Angle Glaucoma

This is the most common form of glaucoma. The drainage angle formed by the iris and cornea remains open. But other parts of the drainage system don't drain properly. This may lead to a slow, gradual increase in eye pressure.

• Angle Closure Glaucoma

This form of glaucoma occurs when the iris bulges. The bulging iris partially or completely blocks the drainage angle. As a result, fluid can't circulate through the eye and pressure increases. Angle-closure glaucoma may occur suddenly or gradually.

• Normal-Tension Glaucoma

No one knows the exact reason why the optic nerve becomes damaged when eye pressure is normal. The optic nerve may be sensitive or experience less blood flow. This limited blood flow may be caused by the buildup of fatty deposits in the arteries or other conditions that damage circulation. The buildup of fatty deposits in the arteries also is known as atherosclerosis.

• Glaucoma In Children

A child may be born with glaucoma or develop it in the first few years of life. Blocked drainage, injury or an underlying medical condition may cause optic nerve damage.

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PREVENTION

1. These steps may help detect and manage glaucoma in its early stages. That may help to prevent vision loss or slow its progress.
2. Get regular eye examinations. Regular comprehensive eye exams can help detect glaucoma in its early stages, before significant damage occurs.
3. As a general rule, the American Academy of Ophthalmology recommends a comprehensive eye exam every 5 to 10 years if you're under 40 years old; every 2 to 4 years if you're 40 to 54 years old; every 1 to 3 years if you're 55 to 64 years old; and every 1 to 2 years if you're older than 65.
4. If you're at risk of glaucoma, you'll need more frequent screening. Ask your health care provider to recommend the right screening schedule for you.
5. Know your family's eye health history. Glaucoma tends to run in families. If you're at increased risk, you may need more frequent screening.
6. Wear eye protection. Serious eye injuries can lead to glaucoma. Wear eye protection when using power tools or playing sports.
7. Take prescribed eye drops regularly. Glaucoma eye drops can significantly reduce the risk that high eye pressure will progress to glaucoma. Use eye drops as prescribed by your health care provider even if you have no symptoms.

DIAGNOSIS

1. Glaucoma is usually picked up during a routine eye test, often before it causes any noticeable symptoms. Other tests are usually needed afterwards to diagnose and monitor the condition.
2. It's important to have regular eye tests so problems such as glaucoma can be diagnosed and treated as early as possible. Early treatment can help stop your vision becoming severely affected.
3. You can get an eye test at a local opticians, and the tests are carried out by an optometrist. Find an optician near you. Some people can receive free eye tests on the NHS. Find out if you're entitled to free NHS eye tests.
4. Tests to diagnose and monitor glaucoma

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5. There are different tests that can be carried out by an optometrist if they suspect you have glaucoma after a routine eye test.

1. Eye Pressure Test

An eye pressure test (tonometry) uses an instrument called a tonometer to measure the pressure inside your eye.
The optometrist will put a small amount of painkilling medicine (anaesthetic) and dye into the front of your eye. They will then shine a light into your eye and gently touch the surface of it surface of it with the tonometer.
Some optometrists use a different instrument, which uses a puff of air and doesn't touch the eye, to check pressure.

2.Gonioscopy

Gonioscopy is an examination to look at the front part your eye the fluid-filled space between the coloured part (iris) and the clear window of the front of the eye (cornea). This is where the fluid should drain out of your eye.

3. **Visual field test**

A visual field test (sometimes called perimetry) checks for missing areas of vision. You may be shown a sequence of light spots and asked to press a button to indicate which ones you can see. Some dots will appear at the edges of your vision (your peripheral vision), which is often the first area to be affected by Glaucoma

4. **Optic nerve assessment**

The optic nerve, which connects your eye to your brain, can become damaged in glaucoma, so an assessment may be carried out to see if it's healthy.

TREATMENT

The damage caused by glaucoma can't be reversed. But treatment and regular checkups can help slow or prevent vision loss, especially if you catch the disease in its early stages.
Glaucoma is treated by lowering intraocular pressure. Treatment options include prescription eye drops, oral medicines, laser treatment, surgery or a combination of approaches.

• Eyedrops

Glaucoma treatment often starts with prescription eye drops. Some may decrease eye pressure by improving how fluid drains from your eye. Others decrease the amount of fluid your eye makes. Depending on how low your eye pressure needs to be, you may be prescribed more than one eye drop.

- **Oral medications**

Eye drops alone may not bring your eye pressure down to the desired level. So your eye doctor may also prescribe oral medicine. This medicine is usually a carbonic anhydrase inhibitor. Possible side effects include frequent urination, tingling in the fingers and toes, depression, stomach upset, and kidney stones.

- **Surgery and other therapies**

Other treatment options include laser therapy and surgery. The following techniques may help to drain fluid within the eye and lower eye pressure.

- **Laser therapy**

Laser trabeculoplasty (truh-BEK-u-low-plas -tee) is an option if you can't tolerate eye drops. It also may be used if medicine hasn't slowed the progression of your disease.

- **Filtering surgery**

This is a surgical procedure called a trabeculectomy (truh bek-u- LEK-tuh-me). The eye surgeon creates an opening in the white of the eye, which also is known as the sclera. The surgery creates another space for fluid to leave the eye.

- **Drainage tubes.**

In this procedure, the eye surgeon inserts a small tube in your eye to drain excess fluid to lower eye pressure.

- **Minimally invasive glaucoma surgery (MIGS).**

Your eye doctor may suggest a MIGS procedure to lower your eye pressure. These procedures generally require less immediate postoperative care and have less risk than trabeculectomy or using a drainage device.

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CONCLUSION

Glaucoma is a common eye disease that is usually associated with an elevated intraocular pressure. Treatment options for patients with glaucoma include medications, laser therapy, and incisional surgery. The risks and benefits of each type of treatment must be carefully considered to maximize the treatment's benefits while minimizing adverse effects.

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