

Secondary Glaucoma: A Review

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Abstract

Glaucoma is an irreversibly blinding eye disease which damages optic nerve fibres. The disease may be asymptomatic in certain clinical types, until advanced stage; hence so much emphasis is to be given for early diagnosis. Other types of glaucoma which produce symptoms also need timely attention before severe visual impairment occurs. This article explains the various secondary glaucomas, their varied etiologies and management.

Keywords: *Secondary Glaucoma; Optic Nerve Fibres*

Introduction

Glaucoma is a chronic progressive optic neuropathy caused by a group of ocular conditions which leads to damage of the optic nerve along with loss of visual function with associated raised intra ocular pressure. Glaucoma is divided in two orbitary divisions. Primary glaucoma appears to be genetically influenced and is not consistently associated with other ocular or systemic diseases. Secondary glaucomas are group of disorders in which rise of intra ocular pressure is associated with some secondary ocular cause or systemic disease.

It is estimated that glaucoma is responsible for about 5.2 million blind in the world and accounts for about 12% of the new cases of blindness in each year. It accounts for about 8.5% of the patients who visit an ophthalmologist. It is rare in infants and children and is uncommon in young adults. It becomes increasingly prevalent with each decade over the age of 40 [1-3].

Secondary glaucoma per se is not a disease entity but a group of disorders in which rise of intra ocular pressure is associated with some secondary ocular cause or systemic disease. The clinical features comprise that of the primary disease and due to the effect of raised intra ocular pressure. In secondary angle closure glaucoma, the iris is physically obstructing the drainage angle of the eye. Various conditions may cause secondary angle closure glaucoma which includes lens induced glaucoma and neovascular glaucoma. In secondary angle closure glaucoma, the natural drainage angle is narrow either because of the underlying condition or because of its formation. In open angle glaucoma there is no physical obstruction of drainage angle of the eyes. As its name suggests, this name is given to the group of glaucoma where there is another condition causing the raised intraocular pressure and thus the glaucoma. Conditions which may cause secondary open angle glaucoma include pigment dispersion, induced glaucoma and traumatic glaucoma [4-6].

Classification of secondary glaucoma [7-10]

As with primary glaucoma, secondary glaucoma can be of the open-angle or angle-closure type and it can occur in one or both eyes.

Secondary glaucoma may be caused by an eye injury, inflammation, certain drugs such as steroids and advanced cases of cataract or diabetes. The type of treatment will depend on the underlying cause, but usually includes medications, laser surgery, or conventional surgery.

Inflammatory Glaucoma

This type of glaucoma is caused by eye inflammation or uveitis. In uveitic open angle glaucoma, there is inflammation of the trabecular meshwork (trabeculitis) or blockage of the trabecular meshwork by inflammatory cells and byproducts. In uveitic closed angle glaucoma, adhesion of the iris to the angle structures (synechia) prevents drainage of the aqueous. Treatment involves the use of anti-inflammatory drugs and appropriate measures to lower eye pressure.

Neovascular Glaucoma

In patients with diabetes mellitus, vascular abnormalities result in poor blood supply to the retina. Ischemia triggers the growth of abnormal blood vessels (neovascularization) in the retina as well as in the anterior chamber angle. These abnormal vessels effectively block the drainage channels in the eye. Panretinal photocoagulation for diabetic retinopathy as well as glaucoma surgery are essential for treatment. Aside from diabetes, central retinal blood vessel occlusion can also cause neovascular glaucoma.

Traumatic Glaucoma

Any injury to the eye can lead to traumatic glaucoma. In the acute phase, red blood cells in the anterior chamber (hyphema) can clog up the angle and raise the intraocular pressure. In other cases, blunt trauma can rip the trabecular meshwork as seen in angle-recession glaucoma. This type of glaucoma can occur from weeks to even months after the injury due to scarring of the meshwork.

Lens-Induced Glaucoma

A complication of untreated cataract is lens-induced glaucoma. A large cataract (intumescent lens) can cause pupillary block and angle closure (phacomorphic glaucoma). A leaky cataract can cause inflammation in the anterior chamber and increased eye pressure (phacolytic glaucoma). In addition to adequate pressure control, cataract surgery has to be performed.

Steroid-Induced Glaucoma

Long-term use of steroids whether as eye drops, eye ointments, injections or oral medications can trigger a rise in intraocular pressure. It is believed that a cascade of reactions leads to increased resistance to aqueous outflow in the trabecular meshwork. Some individuals are more susceptible to pressure spikes brought about by steroids than others.

Pigmentary Glaucoma

Pigmentary glaucoma is a type of secondary glaucoma more commonly found in young adult males. Pigment granules from the iris are dispersed into the anterior chamber eventually blocking the trabecular meshwork. Treatment is like that of primary open angle glaucoma.

Agarwal, *et al.* (1982) studied that the relative frequency of various causes leading to secondary glaucoma is likely to show variation in different parts of the world with passage of time. Phacogenic glaucoma is likely to be encountered more frequently in the areas where hyper maturity of the lens is seen more often [1].

Rijal AP (2005) determined the prevalence and pattern of glaucomas presented to Nepal Eye Hospital for strategic planning, studied the most common attributable factors giving rise to secondary glaucoma and found the incidence of Glaucoma blindness [3].

According to Grub, *et al.* (2005), the prevalence of glaucoma in patients with intra or extra ocular inflammation is five to twenty percent. The etiopathogenesis is manifold, including the classical secondary open and closed angle mechanisms as well as specific inflammatory elements. Diagnosis and follow up studies of inflammatory glaucomas are often difficult. The therapeutic options are limited or are poorly evaluated [5]. The development of a secondary glaucoma is a severe complication of intra or extra ocular inflammation and may even lead to blindness. He concluded that further investigations, especially with regard to the treatment of inflammatory glaucomas, are necessary to improve the prognosis.

Conclusion

Glaucoma is the third most frequent cause of blindness in the world with the total of 5.2 million blind people as a result of this entity and 80% live in developing countries.

Most common causes are trauma, cataract, infectious uveitis and steroids.

The development of a secondary glaucoma is a severe complication of intra or extra ocular inflammation and may even lead to blindness. Hence awareness programme on glaucoma should be done frequently among urban as well as rural society. Also patients over the age of 35 and with a family history of glaucoma attending an ophthalmologist should be screened for glaucoma and this task lies in the hands of the optometrists.

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