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## Short Note on Glaucoma

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### Commentary

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### Introduction

Glaucoma is neuropathic disorder that effects on an average of 60 million people and causes bilateral blindness in 8.4 million subjects all over the world [1]. Glaucoma is an irreversible blindness caused due to damage of the ganglion and axon cells of the optic nerve that transfer image from retina to brain. This damage causes atrophy and cupping of optic nerve head. In progression this will lead to damage of retinal ganglion cells. Glaucoma is the second leading etiology for blindness around the world and it is estimated to project over 56 million people will get effected with this disease by 2020 [2]. It is necessary to ingest awareness and rational about causes and treatment in to the public and disease prone people such as diabetes and people over 50 years of age.

Glaucoma in an optic neuropathy, that causes blindness in 8.4 million and estimated to affect 60 million people all over the world [1]. This is a condition of eye in which optic nerve gets damaged due to pressure referred as intraocular pressure built up in the eye. This can be due to various reasons which might get worse on time. Damage to the optic nerve will affect the image transmission to the brain. If the pressure continues to increase the subject will lose the vision permanently [3]. However with proper medication and care it can be prevented. The main reason for the intraocular pressure can be intraocular fluid called Aqueous humor or anatomical abnormality. When the fluid is not circulating normally as it used to be, it will accumulate in front of the eye and exerts pressure. This can be due to obstruction at the trabecular mesh channel where the aqueous humor gets filtered. When this channel is blocked aqueous humor will not filter and circulate leading to intraocular pressure. The exact cause for this is not known [4].

According to one survey statistics 67 million people worldwide are affected with a primary glaucoma. [5] Glaucoma can occur both in adults and children. There are various types of glaucoma when it comes to adults they are Open angle glaucoma, Angle closure glaucoma, Normal tension glaucoma, Childhood glaucoma acute glaucoma, pigmentary glaucoma, exfoliation syndrome, trauma related glaucoma [6].

Open angle glaucoma is a neurodegenerative ocular disease in which subject may experience loss of visual field and become blind, due to cell death of retinal ganglion cells and their axons which indicate changes in the visual field atrophy and excavation of the optic nerve head. The reason for this vulnerability of the ocular ganglion cells is assumed to be due to ocular blood circulation, oxidative stress and cytokines. Apoptosis is also considered as vital part for the open angle glaucoma [7]. Angle closure glaucoma is an anatomical disorder in which the intraocular pressure increases as a result of permanent closure of the part of filtration angle due to iris apposition to the filtration mesh called trabecular meshwork. This closure of the filtration channel results in increased intraocular liquid aqueous humor ultimately leading to rise of intraocular pressure. As we discussed earlier increased intraocular pressure damages the optic nerve which transmits images to the brain leading to visual field loss [8]. Normal tension glaucoma is a progressive optic nerve damage and loss of visual field in spite of the normal intraocular pressure. The reason for which is thought to be poor blood flow to the optic nerve which leads to death of the cells that transmits images from retina to the brain [9]. However no other reason is identified or known [10]. Glaucoma in children is inherited or due to under development of the eye before the birth of the baby. This condition of glaucoma in children is known as primary congenital glaucoma [11]. The primary treatment for this type of glaucoma to be is considered surgery followed by medication contradictory to adult glaucoma [12]. There are various techniques to diagnose glaucoma like DTI imaging, MRI imaging, Diffusion tensor imaging, photography, Tomography, Biomicroscopy, and Gonioscopy [5,8,13,14].

### **Treatment**

Glaucoma treatment varies with the type of glaucoma. For initial stage glaucoma medication is considered first and depending on its response surgery option will be considered. For advanced stage glaucoma surgery is the only option along with the medication. The most commonly used drugs are  $\beta$ -blockers and prostaglandins [15]. Bimatoprost, latanoprost and timolol are used in treatment of primary open angle glaucoma. Combination of  $\beta$ -blockers with prostaglandins PGF<sub>2</sub> $\alpha$  is not yet available, combination of dorzolamide/timolol fixed combination seemed more effective [15]. These are given in the form of eye drops. Various advanced surgeries are available for treating glaucoma, major are laser surgery, shunt implantation, filtering surgery, trabeculoplasty, iridotomy, cyclophotocoagulation [16]. In trabeculectomy a microsurgery a new drain is created to drain the fluid thereby reducing the intraocular pressure. Glaucoma implants are the best option for some subjects [17]. According to recent studies it is often necessary to use multiple topical medications to achieve target intraocular pressure. Many drugs were in market for glaucoma treatment like Bevacizumab [18], brimonidine, timolol, Bimatoprost, latanoprost, dorzolamide and so on. But, recent studies had proven that a fixed combination of brimonidine/timolol is more effective and shows adherence and persistence than with fixed-combination dorzolamide/timolol or various two bottle combinations. Even with considering patient restart behavior, the fixed combination of brimonidine/timolol showed significantly higher persistence compared with other therapies [19].

### **Conclusion**

Early diagnosis of the glaucoma is the vital part to avoid further damage or permanent visual field loss. Regular checkup with the ophthalmologist will help for early detection. People above 40 years are prone to develop glaucoma due to various age related factors so these people should check at regular intervals. People with diabetics are also more prone to develop glaucoma they should visit the ophthalmologist whenever they experience any discomfort or visual impairment. It is hard to check based on symptoms because glaucoma doesn't come with any symptoms like in other diseases. Loss of vision is irreversible, however lowering the intra ocular pressure at the right time

with right personalized medication can help restoring the normal condition and prevent the further loss of vision. Studies on glaucoma treatment proves that, it is also important to understand the patient behavior as it relates directly to the medication adherence and persistence, and that differences occur among glaucoma treatment patient populations [19].

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