Original Research Paper

Ophthalmology

A STUDY ON RETINAL DISEASES WITH A REFERENCE OF GLAUCOMA

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ABSTRACT Retinal diseases are very harmful for the retina as these can damage any part of retina. There is a thin layer of tissue inside an eye and this layer is known as retina. A number of cells are present in retina which are light-sensitive. There are also some nerve cells which are used to receive and manage information regarding visuals. We are able to see anything due to optic nerves which are used to transfer the visual information to the brain. There are many methods for the treatment of retinal diseases. Blindness or vision loss can be observed if the treatment of retinal diseases is not done on time. There are many retinal diseases like retinal detachment, retinitis pigmentosa and retinal tear etc. The current paper highlights the retinal diseases with a special study on Glaucoma.

KEYWORDS : Retina, Disease, Visual

INTRODUCTION

The trend of vision loss is increasing due to the retinal diseases like Glaucoma. It is observed that the level of glaucoma tends to rise among the patients who undergo retinal surgeries and other procedures. There are many symptoms of retinal diseases. Some of these symptoms are vision loss, damage in side vision, blurred vision and floating specks etc. It is suggested that a person should take advice of specialized doctor on observing any change in the vision.

Diabetes, aging and eye trauma are some common risk factors which are associated with the retinal diseases. In glaucoma disease, the optic nerve of eye is damaged and the condition gets worst with the passage of time. Some amount of pressure starts to generate inside the eye.

Glaucoma disease can either be inherited from parents or is observed in later stage of the life. Intra-ocular pressure damages the optic nerve and transfers blur images to the brain which leads to lower vision or blindness.

In most of the cases, there are no major symptoms which are noticed in the glaucoma patients. But, it is suggested that every person having age more than 40 years should examine his/her eyes from a specialist eye doctor so as to prevent themselves from these kinds of vital eye diseases which are unbearable in older age.

One of the main reasons of glaucoma disease is the exertion of aqueous humor from eye via a mesh-like channel. It is observed that the liquid tends to accumulate when the channel is blocked. Inheritance is regarded as the main cause of this kind of blockage in most of the cases reported.

There are basically, two types of glaucoma i.e. open-angle glaucoma and angle-closure glaucoma. From these two, the former type of glaucoma is found in most of the patients. In open-angle glaucoma, a drain structure is built in the eyes. On the other hand, there is no space for building drain structure in case of angle-closure glaucoma as the space between iris and cornea is very less.

Often, the doctors use drops in order to diagnose glaucoma. Then, eyes are examined and tested for the vision. If glaucoma is found in the patient then doctor checks the optic nerve. Tenometry test is done to check the pressure inside eyes.

Normally, doctors give eye drops to glaucoma patients so that the fluid formation can be minimized to lower down the pressure of eyes. There may be some side-effects like allergy, blurred vision etc. while using the eye drops.

In some cases, laser surgery is performed by the doctors to enhance the fluid flow from the eye resulting in the stoppage of fluid formation. It is observed that some glaucoma patients are treated with micro-surgery where a novel channel is created in order to drain the fluid which results into the reduction of eye pressure.

RESEARCH METHOD

The current study was performed at an academic medical center. 500 patients suffering from glaucoma participated in the current study. The age of the participated patients was 40 or above that with primary open-angle glaucoma (POAG). There were 190 female and 310 male patients who participated in this study.

RESULTS AND DATA INTERPRETATION

The following table presents the age and gender of glaucoma patients with or without comorbid retinal disease.

Table 1 Age of glaucoma patients with or without comorbid retinal disease

Age	Glaucoma patients with comorbid retinal disease (n=300)	Glaucoma patients without comorbid retinal disease (n=200)
40-49	24	18
50-59	45	37
60-69	61	49
70-79	74	67
80-89	84	20
>=90	12	9

DATA INTERPRETATION:

It is clear from table 1 that out of 500 patients, there were 300 glaucoma patients with comorbid retinal disease and there were 200 patients without comorbid retinal disease. Also, it was observed that the probability of occurring retinal diseases was increasing with increase in age. There were 84 patients having age between 80 and 89 with comorbid retinal diseases.

TYPE OF GLAUCOMA PATIENTS

Then, these patients were examined to know the type of glaucoma such as primary open-angle glaucoma (POAG), pseudoexfoliation glaucoma (PXG), chronic angle-closure glaucoma (CACG) , low tension open-angle glaucoma (NTG) and pigmentary open-angle glaucoma (PG).
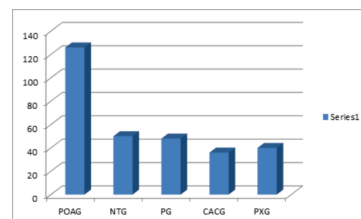

Figure 1: Prevalence of comorbid retinal disease by glaucoma type

DATA INTERPRETATION:

It is clear from the figure 1 that in the current study, there were 54.7% of POAG glaucoma patients with comorbid retinal diseases, 53.19% of

NTG patients and 72.72% PG patients. Also, there were 60% of CACG patients and 80% of PXG patients who participated in the current study.

COMORBID RETINA PREVALENCE BY GLAUCOMA TYPE
The following table shows the prevalence of comorbid retina by the type of glaucoma.

Table 2 Comorbid retina prevalence by glaucoma type

	POAG (n=230)	NTG (n=94)	PG (n=66)	CACG (n=60)	PXG (n=50)
Patients with comorbid retinal diseases	126 (54.7%)	50 (53.19%)	48 (72.72%)	36 (60%)	40 (80%)
Patients without comorbid retinal diseases	104 (45.3%)	44 (46.81%)	18 (27.28%)	24 (40%)	10 (20%)

DATA INTERPRETATION:
It is clear from Table 2 that there were total 230 POAG glaucoma patients. Out of these, 126 patients were with comorbid retinal diseases. Also, there were 94 NTG patients with 50 RCs. Similarly, there were 48 PG patients out of 66 with comorbid retinal diseases.

RETINAL STATUS
The following figure represents the prevalence of blindness and low vision as retinal status of the participated patients.
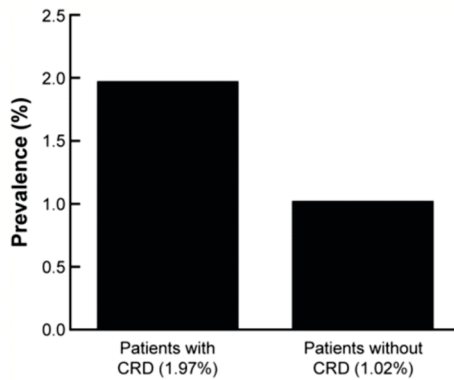

Figure 2: Prevalence of blindness and low vision

DATA INTERPRETATION:
It is clear from Figure 2 that the level of blindness and lower vision was more in case of glaucoma patients with comorbid retinal diseases as compared to those without comorbid retinal diseases where the percentage was observed to be 1.97% in former case and 1.02% in the latter case.

DISCUSSION
In the current study, glaucoma types like primary open-angle glaucoma (POAG), pseudoexfoliation glaucoma (PXG), chronic angle-closure glaucoma (CACG), low tension open-angle glaucoma (NTG) and pigmentary open-angle glaucoma (PG) were included. These criteria were used in order to enhance the accuracy of the diagnosis related to glaucoma.

During the study, some kind of consistency was observed in the diagnoses of glaucoma as there might be progression in disease in the patients with retinal disease. Patients were also examined for vision loss and blindness.

It is observed that glaucoma is the most common among the patients suffering from retinal disease. The probability of glaucoma is increased with the increase in age and hence, the old-aged people are mostly suffered from glaucoma.

The results showed that diabetic retinopathy was found in approximate 2.8% of glaucoma patients. This study is helpful in the prevalence of comorbid retinal diseases in glaucoma patients.

The following figure shows how the optic nerve is damaged due to intra-ocular pressure inside the eye.
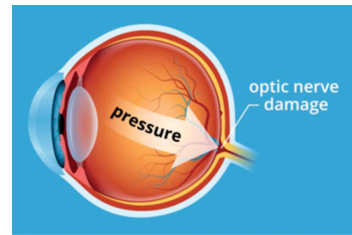
Several large studies have shown that eye pressure is a major risk factor for optic nerve damage. In the front of the eye is a space called the anterior chamber. A clear fluid flows continuously in and out of the chamber and nourishes nearby tissues. The fluid leaves the chamber at the open angle where the cornea and iris meet. (See diagram below.) When the fluid reaches the angle, it flows through a spongy meshwork, like a drain, and leaves the eye.
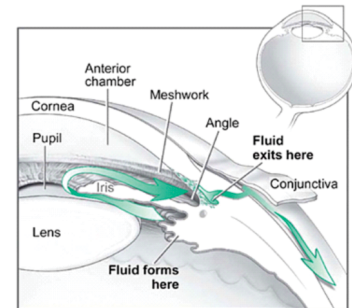
In open-angle glaucoma, even though the drainage angle is "open", the fluid passes too slowly through the meshwork drain. Since the fluid builds up, the pressure inside the eye rises to a level that may damage the optic nerve. When the optic nerve is damaged from increased pressure, open-angle glaucoma-and vision loss—may result. That's why controlling pressure inside the eye is important. Another risk factor for optic nerve damage relates to blood pressure.

CONCLUSION
The high prevalence of comorbid retinal disease and the nearly twofold increase in blindness and low vision in this population demonstrate the need for ophthalmologists to determine if patients have multiple etiologies for their vision loss. The higher prevalence of certain retinal diseases in POAG patients may reflect common patho-physiological processes that warrant further investigation.

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