

Introduction

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Glaucoma is a progressive disease characterised by optic nerve damage and probably loss of vision.

The most common form of glaucoma, primary open angle glaucoma, POAG remains a leading cause of permanent loss of visual function in the adult population. (Visual acuity field of vision).

For any disease entity the logical approach to treatment begins with the knowledge of the mechanisms that cause the disease. The process of identifying the causative factors in most POAG has to date been unsuccessful. As a result our current treatment strategies are not aimed at the cause of the disease, but to one of the identifiable components, the intra-ocular pressure (IOP).

Essentially we have been treating patients with POAG by lowering their IOP (medically or surgically), a strategy that appears to work, but certainly not in every case.

We know that most eyes of adults behave visually well if the IOP is within the statistical average, less than 21 mmHg. A minority within this statistical average or below, can still show signs of visual deterioration. Still a minority above this statistical average can maintain normal function. This is because we never know what is an ideal healthy IOP for this eye.

High intra-ocular pressure is to be considered a risk factor. There are other factors that have been found to play in conjunction, or even without the presence, of a high statistical average pressure; Myopia, Diabetes, Hypertension and not least is the genetic factor.

As we determine the treatment strategy for a patient with POAG we often realise that the one proven available approach is the lowering of the IOP. This approach has been useful in most of the cases of POAG. If we knew what causes the pressure elevation we would prevent it and patients would not have to pay the price of our treatments, their side effects and complications.

Although reduction of high IOP still has its merit, it does not account for continuous failure of field of vision nor continuous retinal ganglion cell damage and optic atrophy.

Therefore it is worth while before writing a prescription for lowering the intraocular pressure to be sure that:

- 1) This pressure is pathological for this eye.
- b) This pressure is high at other times of the day (Diurnal variation).

Spot light

A normal person loses 10,000 Retinal Ganglion Cells (RGCs) per year, due to many factors e.g hypoxia, genetic...

So by the age of 80 years he would have lost 50% of his RGCs.

In the case of POAG a normal person would have lost 50% of his RGSs by the time visual loss becomes evident.

This loss of RGCs or apoptosis (cell suicide) is due to many factors and not only due to high IOP.

High IOP mechanically would prevent surgical factors initiated by retrograde axoplasmic transport from reaching the RGCs.

Other factors come into play and cause RGC apoptosis, not to mention ischaemia, genetic and biological factors.

Biological excitotoxic factor aminoacid Glutamin can induce excitation under certain conditions and toxic effect in others.