

Economics of Glaucoma

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30 years ago, there were only a few therapies for glaucoma, many of which had unpleasant side effects. Over the years, surgical procedures and therapeutics have improved, and new drugs now include latanoprost, which uses a new mechanism for lowering intraocular pressure (IOP), and the α -adrenergic agents such as brimonidine. In spite of this, there are still some major challenges ahead in the 21st century.

Population Growth ...

The World Health Organization (WHO) estimates that 16 million people are blind due to cataracts and 5 million are blind due to glaucoma. One WHO prediction is that visual disability will double by the year 2020 when 54 million people aged 60 years or above will be blind, 50 million of whom will live in developing countries.

Dramatic increases in life expectancy will lead to global epidemics of cancer and other chronic diseases in the next few decades. The main result will be a huge increase in human suffering and disability. A massive increase in the world

population is expected in the next 20-30 years, most of which will occur in developing countries, particularly China and India. Of the 11 largest cities in 2015, 7 will be in Asia. This population growth will not only occur in terms of the volume of population, but will mostly be seen in the elderly population; as populations age, diseases increase in frequency.

... and Glaucoma

A major difficulty with glaucoma is the lack of a uniform case definition. It is well-recognised that glaucoma is not purely concerned with raised IOP, however, "*we have yet to identify any other single factor that will stop glaucomatous progression as effectively as treating the IOP,*" explained Dr Dunbar Hoskins.

Many studies have linked IOP to visual field loss and when treatment is initiated and the IOP becomes stable, the visual field also stabilises.

Fluctuations in visual field can be dramatic and the Low Tension Collaborative Glaucoma Study found that it took almost 3 years before fluctuations in visual field stabilised enough to give a 95% confidence level of change within the limit of 1 decibel of change. Thus, while visual field testing is costly and inconvenient, frequent testing is necessary to recognise changes in the eye. Better methods of measuring visual field are required.

Economics of Screening

A major problem facing ophthalmologists in the 21st century is that health economists believe that glaucoma screening and management "*is not worth the effort*" and are not competitive due to difficulties with test validity, manpower problems and some doubts about the natural history of the disease, therefore national screening programmes are generally not justified on the basis of cost-effectiveness.

Interestingly, the Canadian Task-force on Periodic Health Evaluation found that glaucoma screening and management costs US\$75,000 per year of blindness prevented while a heart transplant costs only US\$10,000 per year of life prolonged.¹ However, this situation could change with an improved test with greater validity for primary screening.

In order to convince economists that glaucoma screening is justified, the following will need to be addressed:

- Clear definition of the disease
- Low cost detection of treatable disease
- Identification of the risk of serious vision loss
- Simplified long-term treatments
- Cost-effective measurement tools
- Better distribution of care givers.

There is no doubt that economics will govern the treatment of glaucoma. Economic development is the best way to manage any disease process and greater economic development will help to solve many of these problems.

Reference

1. Boivin JF, McGregor M, Archer C. Cost effectiveness of screening for primary open angle glaucoma. *J Med Screen* 1996;3:154-163.

