

Screening for eye disease in the elderly: is it worth it?

Should we be screening for eye disorders in the elderly population? Visual impairment in the elderly can be associated with reduced functional status and quality of life, low social contact, depression, and falls and hip fractures (Dargent-Molina et al, 1996). It therefore would seem sensible to identify those elderly patients who have or are at risk of developing sight-threatening eye disorders, and offer them treatment. However, screening for disease of any kind raises a number of issues.

Causes of vision loss in the elderly

It is important to differentiate between case finding, sometimes called opportunistic screening, and population screening. Case finding is an important part of any physician's workload and involves the detection by history, examination and investigations of previously unsuspected disease. For ophthalmologists and optometrists the best example is the detection of glaucoma, which is why all new patients over the age of 40 years attending an eye clinic should have an intraocular pressure measurement and optic disc assessment as part of their ophthalmic examination. The cost in terms of time and expense to the hospital is minimal but the potential benefit to the patient may be huge – the difference between retaining vision and eventually going blind. However, for population screening things are more complicated and systematic population screening should only be set up if certain defined criteria are met, as summarized in *Table 1*.

Analysis of the causes of blind registrations in 1999–2000 in England and Wales show that the three major causes of registerable blindness were age-related macular degeneration (57.2%), glaucoma (10.9%) and diabetic retinopathy (5.9%) (Bunce and Wormald, 2008). At present in the UK diabetic retinopathy is the only condition to meet the requirements of the UK National Screening Committee for systematic population screening and it has been

rolled out by the Department of Health as a programme since 2003. The UK probably now leads the world in diabetic retinopathy screening expertise (Scanlon, 2008).

Diabetic retinopathy

Diabetic retinopathy is the major cause of blindness in those of working age in England and Wales but also is the third highest cause of blindness in those aged 75 years and above (Bunce and Wormald, 2008). The main objective of the national screening programmes in the UK is to reduce the risk of sight loss among people with diabetes caused by diabetic retinopathy but, as Scanlon (2008) has indicated, these schemes are still in their infancy.

For England the diabetic retinopathy screening programme has the potential to reduce the prevalence of blindness from diabetic retinopathy from 4200 people to 1000 people and a conservative estimate of reducing the annual incidence of diabetic retinopathy blindness by one-third would save 427 people each year from blindness.

Glaucoma

Chronic open-angle glaucoma is an acquired chronic optic neuropathy which causes progressive loss of peripheral vision and is a leading cause of blindness worldwide. While the precise pathophysiology of glaucoma is unknown, the end result is retinal ganglion cell death with loss of nerve fibres. Most individuals with glaucoma have raised intraocular pressure sec-

ondary to reduced aqueous outflow through the trabecular meshwork. Two major prospective studies and a meta-analysis of randomized controlled trials have shown conclusively that treatment to reduce intraocular pressure can prevent visual disability and blindness in this condition (AGIS Investigators, 2000; Lichter et al, 2001; Maier et al, 2005).

On the face of it, open-angle glaucoma appears to be the ideal eye condition for which to set up a national screening programme. It is an important public health problem, it has proven effective interventions and it can be detected with relatively easy tests. However, a review by the Health Technology Assessment programme found that general population screening appears not to be cost-effective (Burr et al, 2007). It is likely therefore that in the UK open-angle glaucoma detection will continue to be opportunistic, via case finding by optometrists, rather than by population screening programmes.

The recent guidance on glaucoma by the National Institute for Health and Clinical Excellence (NICE) emphasized the importance of clear guidance on referral of cases with raised intraocular pressure (ocular hypertension) by optometrists to the hospital eye service (NICE, 2009). Different interpretation of the guidelines by optometrists and ophthalmologists immediately caused a significant over-referral of cases of ocular hypertension by optometrists which threatened to swamp ophthalmic out-

Table 1. Criteria for population screening for the four major blinding disorders

Screening criteria	Age-related macular degeneration	Open-angle glaucoma	Diabetic retinopathy	Cataract
Important public health burden	Yes	Yes	Yes	Yes
Asymptomatic	Yes/no	Yes	Yes	No
Effective screening techniques	Possibly	Yes	Yes	Yes
Improve prognosis with early detection	Yes	Yes	Yes	No
Effective treatment	Yes/no	Yes	Yes	Yes
Cost effective	Unknown	No	Yes	Unknown
Meets UK National Screening Committee criteria	No	No	Yes	No

patient departments in England and Wales with 'normal' cases. This led to NICE issuing an urgent clarification statement. The difference in interpretation hinged on the technique of measuring intraocular pressure, demonstrating the unforeseen difficulties that can occur with publishing lengthy national guidelines (Royal College of Ophthalmologists, 2009a).

Age-related macular degeneration

Age-related macular degeneration is classified as dry and wet types, according to the type of degeneration. The dry type is categorized by atrophic changes in the retinal pigment epithelium and overlying neurosensory retina and by gradual loss of central vision. It is currently untreatable but there is evidence that nutritional supplements may have a mild beneficial effect in prevention of age-related macular degeneration.

The wet type of age-related macular degeneration is so called because of the abnormal growth of choroidal new vessels under the macula and leakage of exudates and haemorrhage causing sudden onset of visual symptoms in the form of disturbance of central vision and eventual macular scarring. Wet age-related macular degeneration is now treatable with intravitreal injections of ranibizumab (Lucentis) or bevacizumab (Avastin). Early referral for wet age-related macular degeneration is essential for effective treatment and in most parts of the UK there are rapid access macular referral clinics (Royal College of Ophthalmologists, 2009b).

Currently there are no population screening programmes for age-related macular degeneration, as it does not fulfil the criteria for systematic screening (Table 1) but interest has turned to identifying patients who might be at risk of developing age-related macular degeneration and those cases that might benefit from nutritional supplements. It has been proposed that in future patients could have an age-related macular degeneration 'risk factor assessment'. This could include family history, genetic testing for age-related macular degeneration susceptible genes, environmental and lifestyle assessment including smoking history, retinal imaging and measurement of macular pigment density which is thought to be a protective factor. In this way patients considered at risk could be alerted and advised about possible preventive strategies including nutritional supplements.

Cataract

Cataract is a major cause of vision loss in the elderly but in the UK cataract is no longer a major cause of blindness. In the West of Scotland study Bamashmus et al (2004) found that, of the few people still being registered visually handicapped with cataracts, most had other contributing causes for their visual loss and/or were unwilling or unfit to undergo surgery.

In addition because the onset of cataract in the elderly is symptomatic and surgery can normally be performed at any stage without adversely affecting the prognosis, cataract does not fulfil the indications for a national screening programme.

Screening for poor vision and refractive error in the elderly

Older people can easily lose their independence through poor vision and are then more susceptible to falls, lower quality of life and depression. All persons aged 60 years and over in the UK are entitled to a free NHS sight test, and it is an important means of detecting asymptomatic eye disorders. However, there is currently no evidence that systematic community screening is effective in improving vision in elderly people (Smeeth et al, 2003).

Conclusions

At present there is no convincing case for organized population screening for the major sight-threatening eye disorders that affect the elderly population. The exception is screening for diabetic retinopathy which has been set up as a national programme throughout the UK for all persons with diabetes aged 12 years or older. Therefore opportunistic screening will remain an important source of case detection in the elderly and health professionals dealing with eye care should ensure that these patients receive a full eye examina-

tion, including intraocular pressure measurement and pupil dilatation. **BJHM**

Jonathan Gibson

Professor of Ophthalmology

Aston University

Consultant Ophthalmologist

Birmingham and Midland Eye Centre

Sandwell and West Birmingham NHS Trust

Birmingham B18 7QH

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KEY POINTS

- The major causes of registerable visual loss in the elderly are age-related macular degeneration, open-angle glaucoma and diabetic retinopathy.
- Cataract is no longer a major cause of blindness in the UK.
- National screening programmes for diabetic retinopathy have been set up in all four nations of the UK.
- The case for systematic screening of the elderly population for macular degeneration, open-angle glaucoma, cataract and uncorrected refractive error has not been made and 'opportunistic' case detection remains important.