INVITED ARTICLE

AN OVERVIEW OF EYE PROBLEMS IN SINGAPORE'S ELDERLY

P T K Chew, C K L Chee

ABSTRACT

Medical problems increase in frequency with advancing age. Ophthalmic problems are no exception, and add to disability in the elderly. Cataract, glaucoma, diabetic retinopathy, retinal detachment and age-related maculopathy are common blinding problems in middle-aged to elderly patients. If recognised early and properly managed, useful vision can be preserved in many cases. However, despite increasing awareness of conditions such as acute angle-closure glaucoma and diabetic retinopathy, patients are still presenting too late to the eye clinics. Successful management and rehabilitation of the patient depend upon greater awareness and early diagnosis, and requires cooperation between all medical personnel who deal with elderly patients.

Keywords: cataract, glaucoma, diabetic retinopathy, retinal detachment, age-related maculopathy

SINGAPORE MED J 1991; Vol 32: 268-270

INTRODUCTION

The frequency of eye disease increases with advancing age. In countries with an increasing proportion of senior citizens such as Singapore, the number of patients with ophthalmic problems is rising and will continue to do so. Good vision in the elderly is as crucial as it is at all ages, and is the key to confident mobility and self reliance. In the older patient recovering from severe and debilitating illness, good visual acuity hastens the patient's recovery of function. The elderly person with poor sight is more prone to accidental injury and is less confident and able to safely cope with their activities of daily life.

Figures from the blind register from 1981-89 revealed that retinal degeneration was the leading cause of blindness (47.3%), with congenital and developmental causes (16.6%) and glaucoma (11.7%) being the second and third most common causes.

This article gives an update on the commoner eye problems in the elderly with emphasis on diagnosis and management, dealing with the sight threatening problems in greater detail.

Common Non Sight Threatening Problems in the Elderly

Laxity of skin around the eyes leads to senile entropion and ectropion and blepharoptosis. Frequently asymptomatic, these problems occasionally cause problems of triachiasis, exposure keratitis and obstruction of vision respectively. They can be corrected by minor plastic procedures.

Dry eyes are common and a perpetual source of ocular discomfort and may be associated with allergies and recurrent conjunctivitis. Topical drops and punctal occlusion can help these patients.

Department of Ophthalmology
National University Hospital
Lower Kent Ridge
Singapore 0511

P T K Chew, FRCS(Edin), M Med(Ophth), FCOphth
Registrar

C K L Chee, FRCS(Edin), M Med(Ophth), FCOphth
Registrar

Correspondence to : Dr P T K Chew

Sight Threatening Eye Problems

Cataract

Cataract is the most common blinding condition in developing countries and accounts for the majority of world blindness[1]. The commoner causes of cataract include advancing age, trauma, various congenital causes, other eye disease eg. uveitis resulting in secondary cataracts, and certain drugs eg. steroids. The formation of a cataract can be thought of as an opacification of the crystalline lens. This occurs as a uniform response to multiple causes of insult or injury to its metabolically active capsular epithelium or to its regular crystalline protein structure.

Age-related cataracts are the commonest type, and as life expectancies increase, there is a corresponding increase in the number of cataracts. Today, extracapsular cataract extraction is the procedure of choice. This technique removes the cataract but leaves the posterior capsule of the cataract behind to support a posterior chamber intraocular lens implant. With this technique, more than 95% of cases obtain 6/12 or better vision[2] post operation, with none of the problems of aphakic spectacles. Surgery is now offered once the patient finds that he or she is disabled by the loss in visual acuity. A mentally alert working patient may find 6/12 vision disabling, whereas in sedentary, elderly patients who have a fear of operations, surgery may be delayed until the patient is troubled enough by his symptoms. However in Singapore the patient presenting with dense hypermature cataracts is still commonly seen and public education is still needed.

Glaucoma

Glaucoma is a blinding condition which is more common in the middle-aged to elderly population[3]. Glaucoma is actually a miscellaneous group of eye conditions where there often is raised intraocular pressure with resultant damage to ocular structures.

A simple classification of glaucoma in the elderly is as follows:

Primary glaucoma:
a) acute angle closure
b) creeping or chronic angle closure
c) chronic open angle

Secondary glaucoma:
a) drug induced eg. steroids
b) traumatic

c) secondary to other eye pathology eg. iritis

The primary glaucomas form the main bulk of glaucoma.

Primary angle closure glaucoma is the commonest glaucoma presenting in Singapore[4]. This is opposite to the pattern in the West where open angle is the commoner variety[5].

Acute angle closure glaucoma has the most dramatic presentation. In eyes which are anatomically predisposed, a flaccid iris blocks the normal transpupillary flow of aqueous, resulting in bowing forward of the iris (iris bombe), and closure of the filtrating angle between the anterior iris surface and the cornea[6]. The intraocular pressure rises precipitously due to the blockage of the outflow channels, and an acute episode results.

The patient presents with a painful, red eye, a sudden fall in vision, and is likely to have severe one-sided headache with nausea. The pupil is found to be unreactive to light and mid-dilated, and the cornea is hazy from the high pressure. The eyeball can be felt to be very hard on digital palpation when compared with the unaffected side.

It is sight saving in these cases to urgently bring down the intraocular pressure medically with intravenous Acetazolamide and topical pilocarpine. The definitive treatment is to perform either a peripheral iridectomy (which can be done surgically or with the laser), or a trabeculectomy[7].

Chronic angle closure glaucoma and open angle glaucoma present more insidiously, and may be asymptomatic until the patient has advanced optic nerve damage with extensive visual field loss due to raised intraocular pressure over a prolonged period of time[8]. An increased cup-disc ratio of 0.6 or greater, decreased visual fields[9] and a gradual loss of vision may be signs and symptoms of chronic angle closure glaucoma. Open angle glaucoma is more common in diabetics and relatives of glaucoma patients, and is inherited in a multifactorial fashion. Treatment is either medical, with topical drops and oral Acetazolamide, or surgical, with drainage procedures such as trabeculectomy.

Although several screening methods for glaucoma in the elderly have been suggested, there is at present no consensus within the ophthalmic community as to the usefulness of screening in picking up glaucoma in the general population[10,11].

Diabetic Retinopathy

Diabetic retinopathy is a major cause of blindness in the developed world[1,12-17,23] and its incidence will increase as the population ages, and better diabetic control enables diabetics to live long enough to develop microvascular pathology in the eyes, kidneys and peripheral circulation[18].

Diabetic retinopathy can be classified into:

1) background

2) pre-proliferative and

3) proliferative retinopathy.

Maculopathy, which is involvement of the macula in the disease process, can occur at any of these stages and causes an early fall in central vision.

Background diabetic retinopathy manifests as dot and blot haemorrhages, microaneurysms and hard exudates. It is not sight threatening unless there is presence of maculopathy. Patients with background retinopathy require no treatment, but should be followed up at least 6 monthly for progression.

Diabetic maculopathy can be classified into focal, diffuse and ischaemic maculopathy. Focal maculopathy is due to a localized area of leakage from unhealthy vessels, resulting in a focal collection of hard exudates. This type of maculopathy is amenable to laser treatment to the leaking area. Diffuse maculopathy refers to generalized oedema of macula area. Laser treatment has limited results in these cases. Ischaemic maculopathy is due to capillary shut-down around the macula. The prognosis for central vision in these cases is poor, with or without treatment.

Pre-proliferative diabetic retinopathy occurs when there is ischaemia of the retina, but no neovascularization. The presence of more than 6 cotton wool spots, numerous large blot haemorrhages and omega loops are signs of retinal ischaemia. This has a tendency to progress to proliferative retinopathy[19].

Proliferative diabetic retinopathy is blinding as it can often result in vitreous haemorrhage from the new vessels, pre-retinal fibrosis and tractional retinal detachment. In severe proliferative disease, neovascularization of the iris (rubeosis iridis) can occur leading to intractable neovascular glaucoma and a painful, blind eye. With laser panretinal photocoagulation, blindness from proliferative retinopathy can be reduced by at least 50%[19-23]. Laser treatment for this condition must be carried out on an urgent basis. In cases which present late with vitreous haemorrhage or traction detachment, complex vitreous surgery can help prevent blindness, but the prognosis is guarded in these cases[24,25].

Despite the widespread availability and easy accessibility of medical services in Singapore, patients are still presenting with advanced diabetic retinopathy with poor prognosis. Routine eye screening of diabetics would help to reduce blindness from diabetic retinopathy.

Age-Related Macular Degeneration (ARMD) formerly called Senile Macular Degeneration

Age-related degeneration of the macula is a condition which becomes more prevalent as life expectancies increase. This condition is the commonest cause of blindness in patients over 60 years in developed countries[26-29], and is on the rise in Singapore.

The disease is due to an abnormal vessel growing near the macula. It tends to be fragile and bleeds easily. The resultant scarring of the delicate retinal photoreceptor cells causes a loss of central macular vision. The primary pathology lies in the Bruch's membrane, which separates the retinal pigment epithelium (RPE) from the choroid. Accumulation of lipofuchsin, a waste product of RPE metabolism, results in thickening of Bruch's membrane and a loss of permeability. This acts as a stimulus for the growth of an abnormal choroidal new vessel into the retina. These degenerative changes are more common at the macula because this area has the highest concentration of photoreceptors, and thus more waste material.

Patients with ARMD experience a decrease in central vision which may manifest initially as distortion of lines and images (metamorphopsia), and this may deteriorate to become a central scotoma, where the central vision is lost. Fortunately, total blindness does not occur, as peripheral vision is maintained, and the patient still has navigational vision. In some cases of ARMD where choroidal neovascularization occurs, laser treatment may reduce visual loss. Patients who complain of visual disturbances should be referred to an ophthalmologist early so that potentially treatable cases can be lasered before haemorrhage and fibrosis have occurred.

Retinal Detachment

Rhegmatogenous retinal detachment occurs when there is a break in the retina allowing fluid from within the vitreous cavity to enter the subretinal space and peel off the retina from the underlying retinal pigment epithelium. Vitreous traction on the retina also contributes to the detachment. Retinal holes and tears often occur within areas of thin, degenerate retina, which is more common in the elderly, as well as in high myopes

and from trauma. A healthy vitreous body can prevent retinal detachment by holding the retina flat; but when the vitreous liquefies with advancing age, it tugs on the retina and can lead to a retinal tear, retinal traction and subsequent detachment.

The symptoms of retinal detachment include:

1. a sudden increase of floaters, due to either a small vitreous haemorrhage from a torn retinal vessel, or pigment dispersion from underlying retinal pigment epithelium through the break in the sensory retina;

2. flashes of light, due to mechanical tugging of the retina by vitreous;

3. a loss of visual field perceived by the patient;

4. decrease in visual acuity, which occurs when the macula becomes detached.

The pupillary light reactions in small detachments are normal. In extensive, longstanding detachments, a relative afferent pupil defect may be present. Examination of the retina should be done through a dilated pupil; detached retina appears greyish, and the retinal breaks may be seen.

Retinal detachment surgery involves various procedures to close the retinal break, and may include cryotherapy, drainage and buckling procedures. The success of surgery depends on the severity of the detachment and how long it has been present. Limited detachments which are operated on early have an over 90% success[30-32], whereas in longstanding total detachments in which fibrosis of the retina (proliferative vitreoretinopathy) has occurred, the prognosis is poor[33,34].

Conclusion

With the tremendous advancement of medical technology in recent years, many blinding conditions of the past are now treatable. Almost all ophthalmic surgery can now be performed under local anaesthesia, and severe multiple systemic illness, common in the elderly population, is seldom a contraindication to any eye surgery.

References

1. Pizzarello LD: The dimensions of the problem of eye disease among the elderly. Ophthalmology 1987; 94:1191-5.
2. Heslin KB, Guerriero PN: Extracapsular cataract extraction and primary posterior chamber lens implantation. J Cataract Refract Surg (JPB) 1986; 12:44-6.
3. Hillman JS: Acute closed-angle glaucoma: an investigation into the effect of delay in treatment. Br J Ophthalmol 1979;63:817.
4. Loh RCK: The Problems of Glaucoma in Singapore. Singapore Med J 1968; 9:76.
5. Hollows FC, Graham PA: Intraocular pressure, glaucoma, and glaucoma suspects in a defined population. Br J Ophthalmol 1966; 50:570.
6. Mapstone R: The mechanism and significance of angle closure. Glaucoma 1980; 22:49.
7. Lim ASM, Lowe R: Primary Angle Closure Glaucoma. Singapore: P G Publishing, 1989.
8. Douglas GR, Drance SM, Schulzer M: The visual field and nerve head in angle closure glaucoma: a comparison of acute and chronic angle glaucoma. Arch Ophthalmol 1975; 93:409.
9. Dhillon B, Chew PTK, Lim ASM: Field loss in primary angle closure glaucoma. Asia Pac J Ophthalmol 1990; 2:85-7.
10. Wand M: Provocative tests in angle cloure glaucoma: a brief review with commentary. Ophthalmic Surg 1974; 5:32.
11. Hart WM: The epidemiology of primary open angle glaucoma and ocular hypertension. The Glaucomas. Vol 2, Chap 43. St Louis: First Edition, Mosby 1989.
12. Amos JF: The epidemiology of diabetes mellitus and blindness due to diabetes. Am J Optom Physiol 1974; 51:676.
13. Keen H: The prevalence of blindness in diabetics. J R Coll Physicians Lond 1972; 7:53.
14. Sorsby A: The Incidence and Causes of Blindess in England and Wales, London. Her Majesty's Stationery Office - Reports on Public Health and Medical Subjects, No 28, 1972: 33, 51.
15. Klein R, Klein BEK, Moss SE, Davis MD, DeMets DL: The Wisconsin Epidemiologic Study of Diabetic Retinopathy. II. Prevalence and risk of diabetic retinopathy when age at diagnosis is less than 30 years. Arch Ophthalmol 1984; 102:520-6.
16. Klein R, Klein BEK, Moss SE, Davis MD, DeMets DL: The Wisconsin Epidemiologic Study of Diabetic Retinopathy. III. Prevalence and risk of diabetic retinopathy when age at diagnosis is 30 years or more. Arch Ophthalmol 1984; 102:527-32.
17. Klein R, Klein BEK, Moss SE, Davis MD, DeMets DL: The Wisconsin Epidemiologic Study of Diabetic Retinopathy. IV. Diabetic Macular Oedema Ophthalmology 1984; 91:1464-74.
18. Oakley WG, Pyke DA, Tattersall RB, et al: Long-term diabetes: a clinical study of 92 patients after 40 years. Q J Med 1974; 43:145.
19. Diabetic Retinopathy Study Research Group: Photocoagulation treatment of proliferative diabetic retinopathy. The second report of diabetic retinopathy study findings. Ophthalmology 1978; 85:81.
20. Diabetic Retinopathy Study Research Group: Preliminary report on effects of photocoagulation therapy. Am J Ophthalmol 1976; 81:383.
21. Diabetic Retinopathy Study Research Group: Photocoagulation treatment of proliferative diabetic retinopathy; clinical application of Diabetic Retinopathy Study (DRS) findings. DRS report no. 8. Ophthalmology (Rochester) 1981; 8:7.
22. Hercules BL, Gayed II, Lucas SB and Jeacock J: Peripheral retinal ablation in the treatment of proliferative diabetic retinopathy: a three-year interim report of a randomised, controlled study using the argon laser. Br J Ophthalmol 1977; 61:555-63.
23. Little HL: Proliferative diabetic retinopathy: pathogenesis and treatment. In: Little HL, Patz A, Forsham PH. eds. Diabetic retinopathy. New York: Thieme-Stratton Inc, 1983.
24. Diabetic Retinopathy Vitrectomy Study Research Group: Two-year course of visual acuity in severe proliferative diabetic retinopathy with conventional management. Diabetic Reinopathy Vitrectomy Study Report 1. Ophthalmology 1985; 92:492.
25. Diabetic Retinopathy Vitrectomy Study Research Group: Early vitrectomy for severe vitreous haemorrhage diabetic retinopathy. Diabetic Retinopathy Vitrectomy Study Report 2. Arch Ophthalmol 1985; 103:1644.
26. Leibowitz HM, Krueger DE, Maunder LR, et al: The Framingham Eye Study Monograph: VI. Macular degeneration. Surv Ophthalmol 1980; 24 (suppl): 428-57.
27. Ferris FL III: Senile macular degeneration: review of epidemiologic features. Am J Epidemiol 1983; 118:132-51.
28. Ghafour IM, Allan D, Foulds WS: Common causes of blindness and visual handicap in the west of Scotland. Br J Ophthalmol 1983; 67:209-13.
29. Feeney-Burns L, Chun-Lan G, Tidwell M: Lysosomal enzyme cytochemistry of human RPE, Bruch's Membrane and dursen. Invest Ophthalmol Vis Sci 1987; 28:1138-47.
30. Burton TC, Lambert RW Jr: A predictive model for visual recovery following retinal detachment surgery. Ophthalmology 1978; 85:619-25.
31. Tani P, Robertson DM, Langworthy: A Rhegmatogenous retinal detachment without macular involvement treated with scleral buckling. Am J Ophthalmol 1980; 90:503-8.
32. Tani P, Robertson DM, Langworthy A: Prognosis for central vision and anatomic reattachment in rhegmatogenous retinal detachment with macula detached. Am J Ophthalmol 1981; 92:611-20.
33. Rachal WF, Burton TC: Changing concepts of failures after retinal detachment surgery. Arch Ophthalmol 1979; 97:480-3.
34. Grizzard WS, Hilton GF: Scleral buckling for retinal detachments complicated by periretinal proliferation. Arch Ophthalmol 1982; 100:419-22.