It might be no coincidence but as the ‘baby boomers’ approach advanced middle age there has been a commensurate interest in the effects of aging on normal physiology as well as obvious concerns in pathological terms. Aging processes are associated with many widespread general conditions such as hypertension, non-insulin dependent diabetes mellitus, and cardiovascular disease.

These conditions are, of course, widespread in developed countries but aging, indeed premature aging, affects many individuals in developing countries. Much of the ophthalmologist’s workload is taken up with age related ocular diseases such as cataract (the commonest cause of blindness worldwide) and age related macular degeneration (ARMD), the major cause of blindness in developed countries. In economic terms cataract presents a considerable burden of disease in countries such as the USA where some 100 000 operations are performed each year; in contrast, in the Indian subcontinent, it is estimated that 50% of middle aged and elderly patients die blind from cataract.

However, several other disorders affecting vision are more common in the middle aged and elderly. Open angle glaucoma has been predicted to overtake other causes of blindness in terms of frequency by the year 2000 while the pandemic in non-insulin dependent diabetes mellitus means that diabetes related blindness is also likely to increase, particularly since diabetic maculopathy, the predominant form of sight threatening retinopathy in this group of patients, is less amenable to therapy than neovascularisation. In addition, one of the commoner indications for keratoplasty, Fuchs’ corneal dystrophy, manifests itself during the middle to late years of life.

The impact of aging on morbidity, mortality, and quality of life generally has induced the American Medical Association to nominate aging as the global theme issue for 1997. Accordingly, the October issues of many participating journals have been assigned to papers related to aging issues. In line with the prevalence of age related disease in ophthalmology, the BJO had no shortage of submissions when it solicited articles for this issue and its contents reflect many of the disorders that are discussed above. In particular, there are papers which deal with cataract and its surgical complications, with the investigation and treatment of glaucoma, and with age related macular degeneration. However, there are also other papers that highlight ophthalmological conditions which in the elderly behave somewhat differently than in younger patients. For instance, Williams et al (p 835) show that age is a risk factor for graft rejection while Zamiri et al (p 827) emphasise the importance of fully investigating elderly patients with atypical chronic posterior uveitis to avoid missing intraocular lymphosarcoma, a rare but age restricted tumour. Other articles deal with ocular surface disease which is also much commoner among elderly patients.

While recognition of the numerous age related diseases increases, the mechanism of aging remains obscure. Genetic influences are suspected since patterns of aging seem to be familial; in addition, there is growing evidence that diseases such as ARMD and open angle glaucoma may be linked to specific gene defects, at least in some forms. Indeed, genetic studies have assisted our clinical understanding of several diseases in that genetic heterogeneity has directed clinicians to search for subtle phenotypic intradisease variation. Perinatal influences on aging have also been suggested, particularly periods of hypoxia which may have prolonged effects carried into old age.

However, the current general hypothesis relating to aging centres on free radical damage for which there is considerable evidence. Indeed, some interesting extensions to the concept suggest that increased cell death may relate to random mutations occurring in the respiratory chain enzymes in mitochondria thereby rendering them less susceptible to lysosomal degradation. This leads to slower turnover of mitochondria and reduces the cell’s respiratory capability leading to early death. Such a notion may have particular implications for lens, retinal, and optic nerve physiology. Free radicals are almost certainly also involved in other recognised mechanisms of aging such as advanced glycation end product accumulation and loss of intracellular chaperones. However, it is likely that the risk of increasing the rate of aging probably relates to relative loss of natural free radical scavengers more than any other specific mechanism.

This of course implies that there is a progressive decline in function with age in the absence of overt disease. In addition to the ubiquitous problem of presbyopia, recent evidence suggests that other vision related functions apart from reduced accommodation may become impaired. For instance, a survey of individuals aged 45 and over in Melbourne has shown that reductions in the visual field occur more commonly in the elderly; in addition, a variety of eye movement defects are also associated with advancing age. In this way, the older patient’s quality of life, including day to day activities such as driving, may be subtly affected.

Editorials

Aging and vision
Aging and the pathogenesis of retinal vein thrombosis

Venous thrombosis has a ‘multiple hit’ pathogenesis in which several adverse influences affecting the composition of the blood, the structure and function of the vessel wall, and blood flow together result in an acute thrombotic event. This is exemplified by the long recognised clinical factors which predispose to thrombosis in the deep veins of the limbs. 

The limb and pelvic veins are the coagulation factor V by activated protein C resistant state, with increased thrombin generation in vivo, is a feature of RVO, other investigators have found no, or a much weaker, association between the occurrence of RVO and

by minor functional visual disabilities which are absent in younger individuals. Therefore, in considering the effects of aging on vision, it is important to differentiate between reduced visual function in the normal healthy elderly individual and the elderly patient with specific age-related disease. While the latter group deserve special research effort to be directed towards them, the former group’s possible reduced quality of life also needs to be addressed.

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Aging and vision

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