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## Editorial

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### Diabetes, glaucoma, sex, and cataract

Ophthalmologists have long been aware of the strong association between diabetes mellitus and cataracts. Waite and Beetham, as early as 1935, and less than 15 years after the introduction of insulin, noted a higher rate of visual loss from cataracts in diabetics compared with non-diabetic controls.<sup>1</sup> Cataract is frequent in diabetics with severe systemic and retinal complications of the disease, as well as in those with few long term complications. Blankenship reviewed the survivors of the original diabetic retinopathy study group photocoagulation trial of 1974, 15 years after treatment.<sup>2</sup> He found that 15 of 51 eyes that had had photocoagulation for severe proliferative diabetic retinopathy had later had cataract surgery. Harding and his colleagues in a large carefully controlled study on a diabetic population in Oxfordshire, found that diabetes mellitus increased the risk of significant cataract by a factor of five compared with the non-diabetic population. Their results, which are based on data from two previously published case controlled studies, are presented in detail in this issue. These data suggest that 11% of all cataracts and, by implication, 11% of all cataract surgery in Oxfordshire, can be attributed to diabetes. Areas of the United Kingdom with a higher prevalence of diabetes mellitus will have a higher total number of cataracts and a higher proportion of cataracts attributable to diabetes.

The prevalence of diabetes varies in different populations, there being more diabetics in older populations and Asian communities than in young or Caucasian communities. Simmons *et al* in 1989 reported that 11.2% of Asian men and 8.9% of Asian women in Coventry had diabetes mellitus.<sup>3</sup> The corresponding prevalence rates for Caucasian men and women in Coventry were 2.8% and 4.3% respectively.

The prevalence of diabetes mellitus, both diagnosed and undiagnosed, has a major influence on the total number of cataracts requiring surgery in any population. Purchasers and providers of health care will therefore need to consider the prevalence of diabetes mellitus and the racial characteristics of their communities when planning ophthalmic services. It is widely known that elderly populations make greater demands on ophthalmic services. The paper of Harding *et al* demonstrates that diabetic populations also make large demands on ophthalmic services. However these demands can be predicted, provided the racial mix of the community

and the prevalence of diabetes are taken into account.

The aetiology of cataract attributed to diabetes mellitus is unknown. It is more common in all groups of diabetics. Good control of blood sugar does not appear to protect against cataract in the same way as the other systemic complications of diabetes. Indeed Dugmore and Tun, in 1980, reported that 44% of 200 patients with cataracts had abnormal glucose tolerance tests.<sup>4</sup> It may be that even near normal blood sugar control does not protect against cataract. Aldose reductase inhibitors have not yet lived up to the initial hopes that they would protect against cataracts. The number of cataracts attributable to diabetes mellitus is therefore unlikely to decrease in the foreseeable future. Health care providers need to make appropriate provision for this. Diabetes mellitus will continue to place an enormous burden on health care systems in both developing and developed countries for a long time to come.

Glaucoma and cataracts have long been associated in the minds of ophthalmologists. Both conditions are largely problems of old age and so are certainly associated in this way.

There has been concern for many years that glaucoma itself, or its treatment by anticholinesterase agents or drainage surgery might cause cataracts. Harding and colleagues' case controlled studies from Oxford show that glaucoma is a powerful and independent risk factor for the development of cataracts. This is the first time that this information has been demonstrated so definitively. Glaucoma may be responsible for 5% of cataracts in their population. It is not possible to say from their data whether it is the glaucoma or its treatment with topical agents or drainage surgery that causes the cataracts. There is reasonable evidence that drainage surgery causes progression of pre-existing cataract, but there is no good evidence as yet that glaucoma surgery does so.

D W FLANAGAN

- 1 Waite JH, Beetham WP. The visual mechanism in diabetes mellitus (a comparative study of 2002 diabetics, and 457 non-diabetics for control). *N Engl J Med* 1935; 212: 367-443.
- 2 Blankenship GW. 15 Year argon laser and xenon photocoagulation. Results of Bascon Palmer Eye Institute patients participating in the Diabetic Retinopathy Study. *Ophthalmology* 1991; 98: 125-8.
- 3 Simmons D, Williams DR, Powell MJ. Prevalence of diabetes in a predominantly Asian community: preliminary findings of the Coventry diabetes study. *BMJ* 1989; 298: 18-21.
- 4 Dugmore WN, Tun K. Glucose tolerance tests in 200 patients with senile cataract. *Br J Ophthalmol* 1980; 64: 689-92.