Correspondence

Risk factors for cataract

SIR, It was with much interest that we read the recent reports by van Heyningen and Harding on risk factors for cataract.^{1,2} The authors should be congratulated on their work. However, as they had collected a data set of such quality, we were surprised that they did not present the results of two important analyses.

First, it seems clear that, while the aetiology of cataract is multifactorial, the risk factors for the three major different types of cataract (cortical, nuclear, and posterior sub-capsular) are also very likely to be different. This being the case, the authors should be strongly encouraged to do a series of subanalyses for each predominant type of cataract, data they surely will have collected.

Second, with the advent of computerized data analysis, much more sophisticated methods of assessing the contribution of multiple risk factors are available. These methods include logistic and polychotomous regression models. The major advantage of the various regression models is that they can simultaneously control for the potential confounding effect of multiple factors that could be related or could interact. The use of these techniques enables the 'study of interactive factors', which in the present study was done on only a very limited scale because 'the numbers reporting any two specific factors are small'.¹ It would also avoid the artefact induced by excluding various subgroups—for example, those reporting steroids from the analysis of the effect of aspirin-like analgesics.² As the authors suggest, there may be a link between severe diarrhoea and military service (and therefore also place of work?), and it could be that these former servicemen also drank more beer and smoked more heavily. The simple stratification used by the authors did not resolve this issue and neither will an analysis of interaction that does not include all the relevant parameters that were identified by bivariate analysis. If the authors have undertaken a comprehensive multivariate analysis using either of the software packages they mention, they should present their results. If they have not, they should do so.

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- 2 Harding JJ, van Heyningen R. Drugs, including alcohol, that act as risk factors for cataract, and possible protection against cataract by aspirin-like analgesics and cyclopentiazide. *Br J Ophthalmol* 1988; 72: 809–14.

SIR, We are grateful to Drs Taylor and Muñoz for their interest in our work and for their two suggestions. In response to the first: our aim was, as stated, to identify

major risk factors for cataract of any type.¹ In earlier studies such as that in Edinburgh the major morphological types of cataract were noted but have not resulted in the discovery of any entirely new risk factor.² Indeed most of the different types of cataract were highly correlated with each other, and although cuneiform cataracts were more weakly correlated than others they showed a major risk factor, diabetes, in common with other morphological types of cataract.³ Even though there was a small excess of cuneiform opacities in diabetics, almost 90% of such opacities were in non-diabetics. The correlation between different morphologies is a manifestation of the well-known occurrence of more than one type of opacity in many cataractous lenses.⁴ Furthermore each cataract patient may report several risk factors—a mean of four apiece in the Edinburgh study.² In the opposite sense a single risk factor, for example, diabetes, has been associated with a variety of different morphological types of cataract both in laboratory animals and in man. This and evidence of a multifactorial aetiology for cataract led to the view that there is a final common network of paths leading to cataract.⁵

Turning to their second point: there are highly sophisticated methods available for the study of multiple risk factors, to help see how factors interact and to look for confounding. The possibility that the apparent risk associated with work on a military base might be due solely to the drinking and smoking habits of military personnel was mentioned briefly in one of the papers cited⁶ and has been dealt with at greater length elsewhere.⁷ The possibility was investigated both by stratification and by multifactorial analysis. The conclusion was that work on a military base was an independent risk factor not associated with beer or cigarettes. Subsequently we have also taken severe diarrhoea into account in this model, and work on a military base remains a significant independent risk factor (relative risk 2.03). Hence we have to look for a different cause for this risk—possibly microwave radiation.

Rather than try to put all 11 risk factors^{1,6} into a model we first omitted two, spironolactone and nifedipine, both of which were marginal with small numbers and where spironolactone is a component of another risk factor—'steroids'. Logit analysis of the remaining nine shows the usual dependence on the order in which variables are entered into the model. Diabetes, myopia, and glaucoma emerge as the most powerful independent risk factors. Renal failure appears as a risk factor if entered before diabetes but not if entered after diabetes, which is consistent with our report that four of the seven renal failure patients in the study were insulin-taking diabetics. All four were cataract cases. The other risk factors, steroids, severe diarrhoea, 'heavy beer drinking', 'heavy smoking', and work on a military base, showed no particular confounding interactions and are marginal risk factors as originally reported.^{1,6,7}

Since the submission of our original paper in January 1987 we have completed a second case control study on 423 cataract patients and 608 controls aged 50 to 79 years (Harding, Egerton, and Harding, unpublished results). In this study we have confirmed diabetes, myopia when young, and glaucoma as major independent risk factors, with severe diarrhoea as a risk factor in septuagenarians. We have identified a new association with peripheral neuropathy. More importantly we have confirmed the protective

effect of aspirin-like analgesics; and have shown that low doses of aspirin, paracetamol, and ibuprofen are associated with the protective effect. In that study we have used log-linear and logit analysis to show that each of these three drugs is associated independently with the protective effect. Low doses of these drugs were associated with a halving of the risk of cataract.

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Perfluoropropane

SIR, We should like to report a case where the intraocular gas, perfluoropropane (C3F8), was used to reform a flat anterior chamber occurring after fistulising surgery. The technique may be of value to others facing this problem.

A 68-year-old man underwent routine trabeculectomy. From the first postoperative day the eye was hypotonous and the anterior chamber shallow. By the fourth day large choroidal effusions were present and cornea-lens contact had developed.

The anterior chamber was reformed with sodium hyaluronate (Healonid) and the sclerostomy sutured tightly shut. Unfortunately by the seventh day after trabeculectomy cornea-lens contact had recurred. The anterior chamber was again reformed with sodium hyaluronate and the choroidal effusions partly drained, but 72 hours later cornea-lens touch was present. On this occasion a bubble of 12% C3F8 was injected through an oblique track in the cornea into the anterior chamber without drainage of the choroidal effusion. This concentration is non-expansile¹ and was used in sufficient volume, approximately 0.5 ml measured in the syringe, to reform the anterior chamber.

The bubble filled the anterior chamber for five days before slowly being absorbed, so that 12 days after injection aqueous filled more than half the chamber. Nineteen days after injection aqueous completely filled the anterior

chamber, the choroidal effusions had disappeared, and intraocular pressure was normal. A single small anterior synechia persisted above.

Axial measurements of corneal thickness taken from the time of insertion of C3F8 showed a gradual thinning, from 0.75 mm to the 0.65 mm of the unoperated eye 12 days after injection. The anterior lens capsule has developed a localised opacity and reduplication of the capsule. This may be related to the episodes of cornea-lens touch or the C3F8.

Choroidal effusions after fistulising surgery are relatively common,² and as most resolve with time treatment can be expectant. When complicated by cornea-lens touch some procedure to reform the anterior chamber is justified. Our experience with this patient demonstrates some of the deficiencies of traditional methods of reformation. The injection of gas may be an approach which will allow sufficient time for the choroidal effusions to resolve.

Since preparing this report we have become aware of the case report by Wilson *et al.*,³ and their experience would seem to agree with ours.

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Treatment of a retinal embolus by photocoagulation

SIR, Occlusion of the retinal arterial tree by an embolus commonly results in permanent visual dysfunction despite early immediate treatment. This is in part due to failure in displacing the embolus. We report a case in which long-duration, low-intensity argon laser photocoagulation was successful in melting a presumed cholesterol embolus and restoring vascular perfusion of the retina.

Case report

A 52-year-old woman presented with a seven-hour history of sudden-onset, inferior, altitudinal visual field loss and blurring of vision in the right eye. Clinical examination revealed a visual acuity of 6/9, confirmed the visual field loss, and demonstrated an embolus at a bifurcation of the superior retinal arteriole. Ocular massage, rebreathing, and intravenous acetazolamide failed to dislodge the embolus. Argon laser photocoagulation was then applied directly to the embolus. Argon blue-green light was used with a 50 µm spot size set at 0.1 watt and continuous. During the laser