

## Editorial: Photocoagulation for diabetic retinopathy

In medicine it is axiomatic that each advance in treatment brings a fresh crop of problems in its wake. The control of diabetes by insulin has done just this, and the increased prevalence of blindness due to diabetic retinopathy in the past two decades is one result. Accurate data are hard to come by, but the report of a committee set up by the British Diabetic Association (1969) estimated that in the United Kingdom there were about 5800 blind diabetics, of whom 44% were over 70 years of age, the prevalence being about 100 per million population or 1.9% of an estimated diabetic population of 300 000. Informal discussion suggests that the current population of diabetics under treatment may be nearer one million.

Faced with this threat of imminent blindness, often in the younger active patient, the introduction of photocoagulation by Meyer-Schwickerath (1959) seemed providential, for it enabled the safe destruction of much of the abnormal retinal vasculature with an apparent improvement of the fundus appearance. But photocoagulation is not without its risks, quite apart from the tragedies which may occur from inexperienced or careless application. Furthermore the natural history of diabetic retinopathy is variable, so the beneficial effect of photocoagulation can be assessed only by a controlled clinical trial, in which treated and untreated eyes, randomly allocated, are observed contemporaneously.

The interim results of two major multicentre trials in Britain and the United States have now been published (Multicentre Photocoagulation Trial, 1975, 1977; Diabetic Retinopathy Study Research Group, 1976). The British trial is concerned solely with xenon arc photocoagulation, while the United States trial also includes argon laser photocoagulation. A controlled trial devoted solely to the latter method of treatment is reported in the current issue of this journal by B. L. Hercules and colleagues (p. 555). The details of these reports should be studied in the original articles, but their message is clear. In proliferative diabetic retinopathy, with new vessels arising from the optic disc, treated eyes fare better than untreated in terms of vitreous haemorrhage and of maintained visual acuity over a follow-up of 2 or 3 years. These statistically significant results constitute a positive indication for treatment of those patients falling within the confines of the treated groups; outside these groups the indications are less clear. The treatment of peripheral new vessels shows some advantage, but here the time factor may

be important, and a decisive result may not be seen until a 5-year follow-up is achieved. Late proliferative retinopathy with massive fibrosis and its complications appears to be uninfluenced.

In maculopathy, the subject of the first report from the Multicentre Photocoagulation Trial (1975), patients showed a decisive improvement in visual acuity after treatment provided the initial impairment was not too severe, but, disappointingly, there was a subsequent decline, which was, however, less than that of the control eyes. This result is in sharp contrast to the results in proliferative retinopathy, where the gap between the visual acuities of treated and control eyes widens with the passage of time owing to stabilisation of treated eyes and continued deterioration of control eyes.

All these trials have used the technique of pan-retinal photocoagulation for the treatment of proliferative diabetic retinopathy. This implies covering the whole fundus, with the exception of the macular area inside the temporal arcades, by a pattern of spaced photocoagulation burns which extend to the equator or beyond. This treatment usually results in a slight decline of visual acuity and some peripheral field loss in the treated eye, greater after xenon arc than argon laser photocoagulation. The relative effectiveness of the two modes of treatment has not yet been decided.

It is now imperative not only that each ophthalmologist should treat or arrange for the treatment of patients under his care with diabetic retinopathy, when their case is suitable, but that the national consequences of this obligation should be faced. This poses a formidable logistic problem: firstly, screening the diabetic population; and, secondly, assessing, treating, and following up those patients with proliferative retinopathy. A screening programme is essential if early proliferative changes are to be discovered, for they are usually symptomless. An annual review taking only 5 minutes of clinical time, if applied to the estimated million diabetics, would require the equivalent of 55 whole-time doctors to provide it. Possibly a way round can be found by the extensive use of technical assistance; even so the cost would be considerable. It is difficult to estimate how many new patients would require treatment each year. But if the figures for the registered blind are taken as a basis (for blindness is the ultimate fate of most untreated proliferative diabetic retinopathy), and allowance made for only 60% of blind diabetics being registered (British Diabetic Association, 1969) a

conservative estimate of 1500 patients per annum emerges. If the entire management (assessment, treatment, and 5-year follow-up) could be achieved in 12 hours' clinical time, it would require the equivalent of 12 whole-time ophthalmologists, with adequate technical and nursing assistance, to provide this basic service, without any allowance for following up borderline cases, dealing with complications, or supervising screening procedures.

What priority such a programme can achieve in these times of financial stringency will emerge only in discussion with the Department of Health and Social Security, but it has the active attention of the British Diabetic Association, which is concerned by the present lack of facilities in many parts of the country.

At present three lines of activity should prepare for the time when treatment can be made available to every diabetic with retinopathy who needs it. First, pilot schemes and research into the best methods of screening are required; by analysing sample populations a better idea of the magnitude of the task and its therapeutic consequences would be

gained. Secondly, ophthalmologists in training should be given more instruction in photocoagulation; and in-service teaching on the management of diabetic retinopathy should be available to both physicians and ophthalmologists. Thirdly, the many administrative problems associated with such a diabetic retinopathy service must be identified and solved.

#### References

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