seen during the sixth episode of glaucomatocyclitic crisis, which occurred, on average, once a year. She recognised the symptoms and signs without difficulty and came to my morning clinic. She had a left-sided mild headache, slight pain in the left eye with mild congestion, slight blurring of vision and haloes around bright light. In the past she was treated with Diamox 250 mg q.i.d. and dexamethasone eyedrops q.i.d. It took, on average, 3 days for the pressure to settle down to normal.

Examination showed the collected vision was 6/6 in both eyes. Slit lamp examination did not show any significant oedema of the cornea. There was no evidence of keratitic precipitates on the posterior surface of the cornea. There were no obvious precipitates at the angle. Aqueous did not show significant flare or cells. Gonioscopy revealed that the chamber angle was wide open. The pupil reacted less briskly compared with the fellow eye. The iris was similar in character when compared with the fellow eye in spite of repeated attacks.

At 9.10 a.m. the patient was asked to lie down and 1 drop of apraclonidine 1% was instilled in the conjunctival sac. The intraocular pressure, which was initially 54 mmHg, dropped to 38 mmHg in an hour, then to 24, 20, 17 and 14 mmHg over the following 4 hours. It stabilised at 14 mmHg and did not rise again over 3 days of monitoring. Examination on the third day showed the fields were normal.

Discussion

Two patients with typical glaucomatocyclitic crisis was treated with apraclonidine hydrochloride 1%. Both showed a fall in intraocular pressure within an hour of application of the drops. In one patient the attack was aborted with a single drop. In the other patient there was an increase in pressure after 6 hours which was returned to normal after one more application. No other medication was used. Apraclonidine may prove to be useful in the treatment of glaucomatocyclitic crises.

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Sir,

Oestrogens and Macular Holes: a Postal Questionnaire

Macular holes are an important cause of central visual loss in the elderly population, and there is a strong female preponderance (70%).[1] Hormonal changes around the time of the menopause, previous hysterectomy, and hormone replacement therapy (HRT) have been cited as possible risk factors[2,3] though not studied in greater detail. Oestrogens have well-documented stimulatory effects on collagen and hyaluronic acid in the skin, and it is possible they may be similarly active within the eye. Factors such as the menopause, hysterectomy, or postmenopausal HRT could modify this effect. We therefore undertook a postal questionnaire of 103 female patients with macular holes, and asked for details of gynaecological and obstetric history. Since 1988, patients with idiopathic full or partial thickness macular holes have been recruited for research studies at Moorfields Eye Hospital. Those with 6 dioptres or more of myopia, and those with a history of ocular trauma or surgery, have been excluded. From this database we were able to identify 103 female patients for the questionnaire, and they all received an introductory letter explaining the purpose of our study, along with the questionnaire itself. (The study was carried out between March and June of 1992.) Ninety questionnaires were returned (response rate 87%).

It was not possible to define the age at onset of macular hole formation since for many patients the diagnosis had been made during the course of a routine eye test, and the time of onset was therefore unknown. Average age was 66 years (range 46–85 years).

The first four questions asked were as follows:

How old were you when your periods started?

How many times have you been pregnant?

How many children have you given birth to?

Have you ever used a contraceptive pill?

Patients experienced the menarche at an average age of 13 years (range 11–16 years), became pregnant 2.5 times, and gave live births on 2.3 occasions. Fourteen of the 90 patients (15%) had taken an oral contraceptive preparation at some time, for an average of 6.7 years. All these figures are similar to those for the general female population.

We then asked:

Have you ever had hot flushes?

Have you passed the menopause?

Have you had a hysterectomy, and if so were the ovaries removed also?

Sixty-three of 88 patients (71%) had experienced hot flushes at some time in the perimenopausal period, and their average age at onset was 47.6 years. Eighty-four of 89 patients (94%) were postmenopausal at the time of diagnosis of their macular hole, the average age at menopause being 50 years. Seventeen of 85 patients (20%) had undergone hysterectomy, and of the 12 patients within this group who answered the associated question on oophorec-

tomy, 6 had had at least one ovary removed at the time of hysterectomy.

The final question asked for details of HRT usage. Fourteen of 87 patients (16%) had taken some kind of HRT. Six were still receiving HRT at the time of the questionnaire, and the youngest of these was aged 55 years (HRT prevalence of 6.9%). Average duration of usage was 2.6 years. To establish data on HRT prevalence in the general population, three General Practices close to Moorfields with computerised prescribing services were studied. From a total of 3357 women aged 55 or over, 268 were receiving HRT at the time of this questionnaire. This gives a prevalence of 8%, which is not significantly different from the figure of 6.9% for the study group (chi-squared test).

A number of factors make the interpretation of results of a study such as ours difficult. Firstly, patients may not clearly remember important historical gynaecological events such as age at menopause, oophorectomy, or duration of HRT. Secondly, the exact timing of hole formation with respect to the menopause is usually unknown, and thirdly an adequate comparative control group is difficult to define. In this study, for instance, though most patients were referred from within London, some came from other parts of the country, so any study of the local (London) population for HRT prevalence may not be strictly comparable. Nevertheless, we feel that an HRT prevalence in the general population of 8% for females 55 years or over in the Moorfields area is accurate, and this is in accord with others.[4] With the reservations listed above, we therefore concluded that there was no evidence from this study for HRT as a risk factor in the development of macular holes.

Twenty per cent of patients in our study group had undergone hysterectomy, a figure that is similar to the usual rate of such surgery in the general population. In contrast, McDonnell *et al.*[2] reported on 52 patients with idiopathic macular cysts or holes, 39 of whom were women. Of these women, 27 (69%) had undergone hysterectomy with or without salpingo-oophorectomy. Oestrogen had been taken by 19 (50%) of the women for menopausal symptoms, for an average of 7 years. Hysterectomy preceded the diagnosis of macular hole or cyst by an average of 16 years, and oestrogen was discontinued in most cases many years before diagnosis. The authors pointed out that in the Framingham population study 35.2% of Vermont women surviving until age 60 years had undergone hysterectomy. They concluded that their macular hole patients had a significantly greater prevalence of hysterectomy and highlighted the need for further study on this subject. They did not speculate on possible reasons for the association.

James and Feman[3] followed up 22 patients with full thickness idiopathic macular holes for an average of 2 years. Twenty were women, and 14 had undergone hysterectomy (70%). (It is not stated whether oophorectomy had also been carried out.) Only 1 woman was documented never to have received an oestrogen-containing medication: 16 had taken a systemic oestrogen preparation for 6 months or longer. The authors pointed out that use of such medications is common in their community (Nashville, Tennessee) and that a causal relationship between systemic oestrogen and macular holes was uncertain. They drew attention to the documented association between declining oestrogen levels and vasoconstriction of uterine arterioles, and questioned whether similar changes might take place within the eye.

Our postal survey has not been able to demonstrate any difference in the hormonal status of those women with macular holes when compared with those without. However, female sex and postmenopausal state remain the strongest known risk factors for their development, and we feel a role for oestrogen remains worthy of consideration. Oestrogen has well-documented effects on hyaluronic acid production,[5] collagen metabolism[6] and vascular smooth muscle tone,[7] and oestrogen receptors are now being identified in non-gynaecological tissues.[6] Any or all of these effects may be operative within the eye, and could influence the development of macular holes in the early postmenopausal years.

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