CORRESPONDENCE

$\gamma\delta$ T cells in aqueous humour from untreated idiopathic uveitis patients

EDITOR,—It is now well established that many lymphocytes are present in the anterior chamber secondary to a blood-ocular barrier breakdown, that most of them are of the T cell lineage,¹ and that in some instances they are activated, as shown by the expression of membrane bound high affinity interleukin 2 receptors.² To the best of our knowledge, however, no studies have determined whether cells bearing the $\gamma\delta$ T cell receptor heterodimer populate the anterior intraocular fluid in both normal and pathological conditions. By using an immunofluorescence staining technique and two direct enumerating monoclonal antibodies (mAbs) [a phycoerythrin conjugated anti-CD3 mAb (T3RD1; Coulter Immunology, Hialeah, FL) and a fluorescein conjugated panreactive $\gamma\delta$ T cell reagent (anti-TCR δ 1; T Cell Sciences, Cambridge, MA)] we carried out two colour cytofluorimetric analysis (FACScan, Becton Dickinson, Mountain View, CA) to evaluate the percentage of $\gamma\delta$ T lymphocytes in the aqueous humour in 10 untreated adult patients with idiopathic anterior uveitis and in eight patients with idiopathic panuveitis. Ocular diagnoses were made on the basis of history, clinical examinations, and results of routine laboratory tests. The diagnosis was confirmed by no clinical evidence of uveitis syndromes, systemic diseases, or concomitant laboratory abnormalities. Aqueous samples for $\gamma\delta$ T cell quantitation were obtained by aqueous paracentesis using a plastic tuberculin syringe and a 27 gauge needle. The percentage of circulating $\gamma\delta$ T lymphocytes calculated after density gradient centrifugation of heparinised venous blood from 12 of our patients, as well as from 10 healthy control subjects was assessed in parallel and used for comparison in statistical analyses. Despite similar proportions of CD3⁺ lymphocytes (data not shown), the number of cells bearing the $\gamma\delta$ T cell receptor for antigen (CD3⁺/TCR δ 1⁺) was significantly higher in aqueous humour than in either the autologous or heterologous bloodstream (Table 1). Although the biological significance of $\gamma\delta$ T cells in ocular fluids during the clinical course of idiopathic uveitis remains unclear, increased levels in the blood of

Table 1 $\gamma\delta$ T cell concentrations (CD3⁺/TCR δ 1⁺) in aqueous humour (AH) from 18 untreated adult patients with idiopathic uveitis (IU), 10 with anterior (A) and eight with panuveitis (P). Peripheral blood samples from 12 uveitis patients (six with LAU and six with IPU) (autologous blood=AB) and 10 healthy controls (heterologous blood=HB) were assayed in parallel and used for comparison in statistical analyses

	CD3 ⁺ /TCR δ 1 ⁺ cells*
AH-IAU	10.6 (4.0)†
AB	3.5 (0.5)
AH-IPU	11.4 (3.6)†
AB	4.4 (2.9)
HB	4.2 (1.9)

*Relative percentages expressed as mean (SEM). Data obtained by direct immunofluorescence followed by two colour cytofluorimetry. †p<0.05 by one way Kruskal-Wallis analysis of variance with respect to both AB and HB.

subjects with some infectious diseases³ and autoimmune disorders,⁴ as well as in the vitreous from a patient with acute sympathetic ophthalmitis⁵ suggest these cells may be involved in immune surveillance and/or autoreactivity. In general, patients with uveitis are treated with local or systemic steroid therapy. We have recently demonstrated that the $\gamma\delta$ T lymphocytes are strongly susceptible to apoptosis induced by glucocorticoids.⁶ If intraocular $\gamma\delta$ T cells play a role in the pathogenesis of idiopathic uveitis, then apoptotic signals may be one of the mechanisms by which these drugs lead to partial or complete remission of the symptoms. Supporting this hypothesis are occasional observations in three patients with ocular complications of toxoplasmosis (two cases) and syphilis (one case) showing that $\gamma\delta$ T lymphocytes were virtually absent in their ocular fluids.

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History of ophthalmology

EDITOR,—I have for some time now been very much enjoying the series 'History of ophthalmology' which appears in your journal, written by the estimable Fiona Roman.

While not going so far as to say that it is the best thing in your columns, it certainly comes close to this and I am constantly amazed and diverted by the extraordinary pieces of information Ms Roman manages to dig up and provide to your readers.

Is it possible for us to know a little more about Ms Roman and her activities? Is she a historian or an ophthalmologist (or both) and may we at some point hope to see some of her articles in a more permanent form such as a book?

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Reply

EDITOR,—I thank John P Lee for his comments. I myself am fascinated by the detailed reports which can be found on all aspects of medical history, particularly where they give a hint of the personalities and attitudes behind them.

Manuscripts often describe completely outlandish procedures which the writer obviously finds quite matter of fact, and appears to firmly believe in. The strangeness of some of the accounts, such as having one's hands severed for operative failure in Babylonia, sometimes makes the gap between these early physicians and ourselves incomprehensible. And then, a few lines later the writer moans about patient compliance or decries his colleagues' treatments in terms we might use today, and suddenly he sounds just like us!

My specialty is not, in fact, ophthalmology, but I would describe myself as a medical writer in the context of these articles. I am a historian only in the sense that it offers scope for my writing. I hope this answers the query and that readers continue to enjoy the articles.

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Chronic lymphatic leukaemia in the elderly

EDITOR,—We recently encountered an 82-year-old woman with stage one chronic lymphatic leukaemia (CLL) who presented 3 days after uncomplicated cataract surgery with endophthalmitis. *Streptococcus pneumoniae* was cultured from the aqueous.

These patients are susceptible to bacterial infections and pneumococcal infection is known to be a particular problem.¹ CLL is the most common leukaemia of the elderly which means patients are likely to present for cataract surgery. We believe consideration should be given to anti-pneumococcal antibiotic prophylaxis in view of the poor prognosis attached to endophthalmitis with such a virulent organism. Subconjunctival vancomycin before surgery would be a suitable choice as it will achieve therapeutic aqueous levels and is active against the pneumococcus.²

We believe that in patients who have had endophthalmitis in the first eye or who have hypogammaglobulinaemia (IgG <50% of the lower limit of normal) additional measures need to be taken for the second eye. Consultation with an immunologist may be helpful as these patients can benefit from intravenous immunoglobulin. This has been shown to decrease the likelihood of infection in at risk patients.³

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Xerophthalmia in Rwandan refugees

EDITOR,—In July 1994 the influx of Rwandan refugees into the Ngara district of Tanzania increased drastically. The newcomers were in worse general condition than previous waves of refugees. During the same period a case of

corneal ulcer was detected. These events prompted a xerophthalmia survey in the six feeding centres of the camps. In each feeding centre all children present on the day of the survey were examined clinically by the author. Risk factors were also investigated. One thousand five hundred and six children were examined. Bitot's spot was seen in four children, conjunctival xerosis in seven, corneal xerosis in one, and corneal ulcer in two. The children attending the two feeding centres serving the population of newcomers had a significantly higher risk of xerophthalmia (prevalence ratio 4.8, $p > 0.01$), as did the children with history of diarrhoea in the previous month (prevalence ratio 1.7, $p > 0.05$).

The 0.3% prevalence of Bitot's spot and 0.2% temporary corneal lesions indicate that this condition is an important health problem in the refugee population investigated, not only because of the risk of blindness but also because vitamin A deficiency is associated with increased mortality mainly from diarrhoea,^{1,2} the major cause of death in the camps. The absence of cases of corneal scar suggests that xerophthalmia is a recent event in this population associated with refugee life, otherwise this permanent lesion would be about five times more frequent than the temporary corneal lesions, because of accumulation.¹ Therefore, the prevalence of this condition should increase over time unless corrective measures are taken. Vitamin A distribution associated with vaccination at registration was strengthened. The history of risk factors for this condition was introduced in the feeding centres for newly admitted children and the at risk population examined for signs of vitamin A deficiency. The Ngara refugee camps are relatively well organised, but xerophthalmia may well affect other refugees and displaced Rwandan people in other camps.

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Serious eye injury caused by rotating wire brushes

EDITOR,—Hassett¹ reported a series of cases highlighting the risk of ocular injury from rotating wire brushes. We wish to emphasise this risk and also remind colleagues that such injuries may lead to serious intraocular infection.

A 37-year-old man sustained a corneal scleral perforation by a piece of wire from a rotating brush. He immediately removed the 3 cm long fragment before presenting to the casualty department. At presentation, visual acuity (VA) was 6/12 in the affected eye. Funduscopy and x ray investigations revealed no evidence of retained intraocular foreign body (IOFB). The anterior chamber (AC) was formed, and slit-lamp examination showed a microhyphaema. The wound was

not self sealing and primary repair was performed within 24 hours of the injury.

On the first postoperative day a hypopyon developed, accompanied by a fibrinous pupillary membrane and intense AC activity. Vitreous biopsy and AC tap provided samples from which a heavy growth of coagulase negative *Staphylococcus aureus* was shown. An intravitreal injection of vancomycin and gentamicin was given, and intensive topical administration of these antibiotics commenced. The signs of infection settled, but a mature cataract developed after 2 weeks.

Six weeks after the injury, he underwent further surgery, combining complete vitrectomy with cataract extraction and capsular fixated posterior chamber lens implantation. After 8 weeks the visual acuity had returned to 6/36.

The overall rate of endophthalmitis secondary to infection following penetrating injury is less than 10%.² Penetrating eye injuries are caused by high velocity projectiles such as hardened steel fragments from cold chisels are thought to carry a low risk of infection. This is because the particles attain very high temperatures before penetration and therefore sterilise themselves.

Wire brushes are not necessarily at a high temperature when they disintegrate and, as demonstrated in our case, may introduce infection. Therefore we recommend that injuries resulting from the use of rotating wire brushes should be treated with caution, as there is a definite risk of subsequent endophthalmitis.

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Reply

EDITOR,—We have read, with interest, of the case described by Chan and Hawksworth. It confirms the serious nature of these injuries. Although intraocular infection did not occur in the cases that we described, clearly there is a risk of endophthalmitis. This further emphasises the importance of the safety precautions that we have recommended.

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Automated ESR analysis in 20 minutes

EDITOR,—Significant benefits to patients and staff can be obtained by performing erythrocyte sedimentation rate (ESR) analysis in 20 minutes in the eye department. Faster sedimentation is possible because of the Boycott phenomenon, whereby erythrocytes sediment more quickly when streaming down the wall

of an angled tube than when falling vertically. This property is utilised in the Ves-Matic system (Biomen diagnostics, Croydon, Surrey CR0 2BN). Premanufactured tubes containing a standard diluent concentration are vacuum filled directly from the venepuncture site and placed into individual holders in the measuring device which maintains the tubes at an angle of 18° to the vertical. A photoelectric cell records the height of the column of erythrocytes before and after sedimentation. The time remaining for the analysis to be complete is displayed, followed by the result, until the next measurement is initiated.

We compared the performance of this portable machine with our laboratory's 'Seditainer' (Beckton Dickinson Vacutainer systems, Cowley, Oxford), ESR method. Seventy patients who required ESR estimation had two blood samples taken from a single venepuncture, for analysis by the above methods. The two measurements showed excellent correlation ($x = 8.6 + 1.15y$, $p = 0.93$).

Three Ves-Matic measuring devices are available: Mini, Junior, and Senior, holding 4, 20, and 60 samples respectively, plus facility for hard copy printout and connection to the laboratory computer. The apparatus is portable, gives a quick accurate result, is simple and convenient to use, and uses a closed system for venepuncture and analysis. It offers a significant time saving to both staff and patients.

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Ophthalmoscopic sign of early keratoconus

EDITOR,—I read with interest the recent letter by Pathmanathan *et al*,¹ about the ophthalmoscopic sign of early keratoconus.

This sign is known to some ophthalmologists and optometrists who use it regularly in the assessment of suspected cases of keratoconus at Moorfields Eye Hospital, London, as 'the oil drop sign', because of the disruption of the red reflex by a circular, dark or reddish-brown central shadow which looks like an oil drop.

The sign is best seen through a dilated pupil with a +5 lens in the direct ophthalmoscope held at 33-50 cm from the observer to the patient's eye² and is almost diagnostic of keratoconus.

Since, however, changes in the refractive index of the lens or early nuclear cataract can be confused with keratoconus when the sign is elicited, it would be desirable to evaluate the cornea from the temporal side also, to eliminate any reflex coming from the lens.

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