subcontinent (fig 1), but that these obscured a continuing increase in *P falciparum* malaria, mainly in travellers from West Africa, which more than trebled between 1973 and 1985. Chloroquine resistant strains of *P falciparum* are now widespread in Asia, South America, and east Africa and are also present in Bangladesh and north east India, but fortunately do not appear to have arisen in west Africa.

Malaria prophylaxis is the most important preventive measure for travellers from Britain, but general advice about protection against mosquito bites should not be omitted. This is given in the Department of Health and Social Security pamphlet *Protect Your Health Abroad* (SA35/1986), which is available to doctors and to the public. Recommendations include keeping the arms and legs covered when out of doors after sunset, sleeping in screened accommodation or under mosquito nets, and using insect sprays and repellants. The specific advice on chemoprophylaxis currently recommended by most authorities is proguanil (Paludrine) 200 mg daily and chloroquine 300 mg weekly for travellers to areas where there is, or may be, transmission of chloroquine resistant *P falciparum* malaria. In other areas either of these two drugs may be used.

AIDS

During March 1986, 23 cases of AIDS were reported to the Communicable Disease Surveillance Centre, bringing the total to 328 since reporting began; 289 (91%) of them were in homosexual or bisexual men.

Although the number of cases reported each quarter is increasing, the rate of increase appears to be diminishing (fig 2). This may indicate that the epidemic in homosexual and bisexual men is beginning to plateau, but it may indicate a decline in reporting or an

FIG 2—Acquired immune deficiency syndrome, Britain: cases by quarter of reporting.

increasing time lag between diagnosis and reporting. Possibly cases are now being more frequently seen by clinicians outside the specialty of genitourinary medicine, not all of whom may be familiar with the national reporting system. All clinicians are therefore invited to report in confidence to the Communicable Disease Surveillance Centre, 61 Colindale Avenue, London NW9 5EQ (telephone 01 200 6868) any case of suspected or confirmed AIDS that comes under their care. A standard questionnaire will be sent for completion, and, again, this is in strict confidence. These questionnaires are analysed by only one medical epidemiologist at the Communicable Disease Surveillance Centre, are kept under secure conditions, and are not available to any other staff. They are essential in providing detailed information for the national surveillance of AIDS.

Lesson of the Week

Use of steroid eye drops in general practice

MICHAEL J LAVIN, GEOFFREY E ROSE

Treatment with steroids, whether systemic or topical, reduces the body's ability to mount an inflammatory response to an injury, whether infective or non-infective.^{1,3} Treatment with steroids entails the administration of a preparation of suitable potency, at a dosage and by a route that will ensure that the drug reaches therapeutic concentrations where necessary, during the appropriate phase (that is, the inflammatory phase) of the disease. It must also be remembered that, by suppressing the inflammatory response, steroids adversely influence the processes acting to localise infective agents and influence the duration and course of the repair of damaged tissues.^{2,4}

It is within the eye, perhaps, that tissues are most susceptible to

General practitioners are advised not to prescribe topical ophthalmic steroids without first seeking the opinion of an ophthalmologist

steroid treatment. Ocular steroids may reach high concentrations in the anterior segment of the eye,⁵ and some of the complex structures—for example, the cornea—are particularly at risk, not only from external infections but also from the damage caused by reparative scarring.

We report on a series of patients with ophthalmic problems who had received treatment with topical steroids before presentation.

Patients and methods

During October and November 1985 we examined about 1800 patients presenting at the casualty department of this hospital for the first time; these

Moorfields Eye Hospital, London WC1V 7AN

MICHAEL J LAVIN, FRCS, registrar

GEOFFREY E ROSE, FRCS, MRCP, senior registrar

Correspondence to: Mr Rose.

patients were either self referred or referred by their general practitioners. All patients were interviewed with particular regard to ocular treatment received for their presenting eye problem, and only those who had a definite history of steroid usage were included in the study. All patients were given a problem oriented ophthalmic examination. Table I gives details of six patients' histories, diagnoses, and treatment.

Results

Of the 1800 patients, 54 (3%) had received treatment with steroid eye drops (or steroid and antibiotic combinations) from their general practitioners. Table II summarises the preparations used and their proportional usage.

The frequency of administration varied from every two hours to once daily. In addition, one patient administered betamethasone 0.1% eye drops every half hour, having heard that an eye drop is cleared from the eye within half an hour. The mean frequency of administration (excluding this extreme case and seven cases of variable frequency) was 3.6 times daily, with a modal frequency of four times daily.

The duration of treatment ranged from one day to roughly a year, with a

TABLE III—Hospital diagnoses for the 54 patients studied

	No (%) of patients		No (%) of patients
Conditions for which steroid treatment is essential:		Conditions for which steroid treatment is contraindicated:	
Uveitis	2 (4)	Bacterial keratitis	1 (2)
Marginal keratitis	1 (2)	Herpes simplex keratitis	2 (4)
Conditions for which steroid treatment is beneficial:		Other conditions:	
Blepharitis	19 (35)	Neomycin allergy or toxicity	4 (7)
Allergic conjunctivitis	3 (6)	Allergic dermatitis	2 (4)
Episcleritis	1 (2)	No diagnostic signs	5 (9)
Conditions for which steroid treatment is not indicated:			
Infective conjunctivitis (viral, TRIC)	4 (7)		
Meibomian cysts	2 (4)		
Blocked nasolacrimal ducts	2 (4)		
Contact lens problems	2 (4)		
Dry eyes	1 (2)		
Inactive acne rosacea	1 (2)		
Herpes zoster	1 (2)		
Trichiasis	1 (2)		

TABLE I—Case reports of six patients presenting at casualty department with ophthalmic problems

Case No	Age and sex	History	Steroid treatment prescribed	Hospital diagnosis	Management	Comment
1	33 years, F	Atopic dermatitis with crusting of lid margin	0.1% betamethasone eye drops four times daily for nine months	Staphylococcal seborrhoeic blepharitis	Steroid treatment stopped. Lid hygiene and chloramphenicol	Steroid treatment not monitored. Inappropriate dose, strength, and duration of treatment
2	6 months, F	Watery eye since birth	0.1% betamethasone eye drops four times daily for six months	Delayed canalisation of nasolacrimal duct	Steroid treatment stopped. Massage of lacrimal sac and chloramphenicol eye drops four times daily	Undiagnosed symptomatology. Inappropriate use of steroids
3	21 yrs, M	Excessive blinking. Daily wearing of soft contact lens with chemical cleaner	0.1% betamethasone eye drops four times daily (actually used every half hour) for one week	None	Steroid treatment stopped	Undiagnosed symptomatology. Steroid treatment suppressed diagnostic signs
4	46 yrs, F	Painful, red eye with visual impairment when wearing extended wear contact lens	0.1% betamethasone eye drops and 0.5% neomycin every two hours for two days	Severe <i>Pseudomonas aeruginosa</i> corneal ulcer with hypopyon	Steroid treatment stopped. Ticarcillin eye drops and gentamicin eye drops every half hour	Steroid treatment caused exacerbation of infective keratitis and severe visual loss
5	72 yrs, F	Painful, red eye with impaired vision	0.1% betamethasone eye drops and 0.5% neomycin four times daily for 10 days	Amoeboid herpes simplex corneal ulcer with pronounced thinning and threatened perforation	Antiviral treatment started and steroid treatment reduced considerably	Inappropriate use of steroids threatened integrity of eye and permanently reduced visual acuity
6	27 yrs, F	Red eye with impaired vision. Previous ocular "ulcers"	0.1% betamethasone eye drops and 0.5% neomycin four times daily for three weeks	Disciform herpes simplex keratouveitis with amoeboid ulcer	Steroid treatment reduced and antiviral treatment started. Steroid treatment increased when epithelium healed	Corneal disease may be managed only by ophthalmologists. Corneal scarring causes considerable visual morbidity

TABLE II—Treatment with steroids and combinations of steroids and antibiotics in 54 patients with ophthalmic problems

Treatment prescribed	No (%) of patients*
Steroids:	21 (38)
Clobetasone 0.1%	3 (5)
Prednisolone 0.5%	1 (2)
Dexamethasone 0.1%	2 (4)
Betamethasone 0.1%	15 (27)
Steroid and antibiotic combinations:	35 (63)
Fluoromethalone 0.1% and neomycin 0.5%	1 (2)
Clobetasone 0.1% and neomycin 0.5%	1 (2)
Hydrocortisone 0.5% and sulphacetamide 10%	1 (2)
Hydrocortisone 0.5% and framycetin 0.5%	1 (2)
Hydrocortisone 1.5% and neomycin 0.5%	7 (12)
Prednisolone 0.5% and neomycin 0.5%	8 (14)
Dexamethasone 0.1% and framycetin 0.5% and gramicidin 0.005%	1 (2)
Dexamethasone 0.1% and neomycin 0.35% and polymyxin B 6000 U/ml	1 (2)
Betamethasone 0.1% and neomycin 0.5%	14 (25)

*Two patients received two preparations each.

mean duration of 6.8 weeks, a median of two weeks, and a mode of one week.

Thirty of the 54 patients (56%) recalled a diagnosis or explanation offered by the general practitioner; these explanations included conjunctivitis (14 out of 30 cases), blepharitis (four cases), allergy (three cases), and ulcer on the eye. In those cases where a general practitioner's note was not available, the possibility that the patient's recall was inaccurate must be considered. Of the general practitioners' explanations for the 30 patients who could recall a medical explanation, only one would have justified treatment with ocular steroids; this patient (case 6) did not, however, have the condition diagnosed by the general practitioner but one that strictly

contraindicated treatment with steroids. In six other cases (20%) steroids were potentially beneficial for the condition diagnosed by the general practitioner, but we would not have used steroids as first line treatment for these conditions.

Table III gives our ophthalmic diagnoses. Our diagnosis disagreed with that of the general practitioner (or the patient's recollection of it) in 23 out of 30 cases (77%). In five cases no ophthalmic condition could be detected and we thus made no diagnosis. We considered appropriate, monitored usage of steroids to be essential in only three of the remaining 49 cases (6%). In 23 cases (47%) treatment was considered to be possibly beneficial but not essential (in 19 of these 23 cases we would not have used steroids as first line treatment), in 20 cases (41%) steroids were not thought to be indicated, and in three (6%) steroids were strictly contraindicated at the time of presentation.

Of 56 preparations used, 35 (63%) were combined steroid and antibiotic (generally neomycin) preparations. Sixteen of these combined preparations (46%) were inappropriate because the steroid was not indicated and 14 out of the 35 (40%) were inappropriate because the antibiotic was not indicated (in 14 cases neither the antibiotic nor the steroid was indicated). In addition, the neomycin was responsible for an allergic response in two of the 32 patients using steroid and neomycin preparations.

Discussion

The 3% prevalence of steroid treatment among patients attending for the first time probably underestimates the prevalence of prescription of ocular steroids in general practice for the following reasons. Firstly, many of the 1800 new patients could not recall their ocular treatment, and, secondly, many minor ocular inflammations

settle naturally or as a result of treatment. On the other hand, patients presenting to the ophthalmic casualty department tend to be those not responding to treatment, which might bias our sample towards those for whom steroid treatment is inappropriate. Earlier treatment with steroids or antibiotics can alter clinical signs, which may explain our finding of five patients with no evidence of eye disease. In all other cases the diagnosis was clear after ocular examination.

Despite the limitations of having a possibly biased sample, the results of the survey proved valuable. The relative frequency of incorrect diagnosis by general practitioners (43%) or of possibly undefined or undiagnosed disease (44%) is not surprising as accurate diagnosis of ocular disease, especially that requiring treatment with steroids, depends on examination using a slit lamp biomicroscope and other specialist ophthalmic techniques. The prescription of ocular steroids (based on the general practitioner's diagnosis) was indicated in only 3% of cases and was potentially beneficial in 20% of cases (but would not have been our first line treatment); it was not indicated in 77% of cases.

In view of our findings we suggest some general principles for the use of steroids.

Ocular conditions for which steroids are essential—Any condition for which steroid treatment is essential requires ophthalmic supervision from the start of treatment; the ocular complications of topical treatment with steroids are numerous and well described.^{6,7} Only one general practitioner named a uveitis as the cause of the patient's ocular disease, a diagnosis for which a steroid would have been indicated; unfortunately, the patient had a condition for which initial treatment with steroids is strictly contraindicated (case 6).

Ocular conditions for which steroids are beneficial—There were 23 cases in which the condition diagnosed would have benefited from second line treatment with steroids. The general practitioner's diagnosis was known in 15 of these cases but agreed with ours in only four (27%). Most notable was the fact that 17 of these 23 patients were given high potency ocular steroids (betamethasone 0.1% eye drops, dexamethasone 0.1% eye drops, or prednisolone 0.5% eye drops), whereas only six out of 23 were given the fairly low potency steroids (hydrocortisone 1.5% eye drops or clobetasone 0.1% eye drops) that are appropriate for these conditions.

Ocular conditions for which steroids are not indicated—There were

22 cases out of 30 in our survey in which the general practitioner's diagnosis was not an indication for treatment with steroids (the most frequent being conjunctivitis, for which a steroid or steroid and antibiotic combination was prescribed). On the basis of the ophthalmic diagnosis 23 cases out of 49 did not require steroid treatment. Steroids were also prescribed inappropriately for three cases of watery eyes (see case 2); for several undiagnosed problems caused by contact lenses (cases 3 and 4); and for miscellaneous conditions such as "dry," "gritty," or "red" eyes.

Ocular conditions for which steroids are contraindicated—In this survey three patients who received topical treatment with steroids had conditions strongly contraindicating such treatment (cases 4, 5, and 6). These three patients all developed severe ocular disease, two required admission to hospital, and all suffered permanent visual impairment as a result of the inappropriate treatment they received before presentation.

Although some of the complications of and contraindications to ocular steroids are listed in the *British National Formulary* and the *Monthly Index of Medical Specialities*, a general practitioner is not in a position to examine the eye accurately or establish a diagnosis and therefore should not be using the steroid preparations listed.

All views expressed in this paper are those of the authors and do not necessarily represent the views of all staff at this hospital.

References

- Charap D. Corticosteroids. In: Duane TD, Jaeger EA, eds. *Biomedical foundations of ophthalmology*. Vol 1. Philadelphia: Harper and Row, 1982.
- Duke-Elder S, Ashton N. Action of cortisone on tissue reactions of inflammation and repair with special reference to the eye. *Br J Ophthalmol* 1951;35:695-707.
- Haynes RC, Murad F. Adrenocorticotrophic hormone; adrenocortical steroids and their synthetic analogs; inhibitors of adrenocortical steroid biosynthesis. In: Gilman AG, Goodman LS, Gilman A, eds. *The pharmacological basis of therapeutics*. 6th ed. New York: MacMillan, 1980:1466-96.
- Ashton N, Cook C. Effect of cortisone on healing of corneal wounds. *Br J Ophthalmol* 1951;35:708-17.
- Liebowitz HM, Berrospi AP, Kupferman A, Rostropo GV, Galvis V, Alvarez JA. Penetration of topically administered prednisolone acetate into the human aqueous humor. *Am J Ophthalmol* 1977;83:402-6.
- Hodapp EA, Kass MA. Corticosteroid induced glaucoma. In: Ritch R, Shields MB, eds. *The secondary glaucomas*. St Louis: C V Mosby, 1982:258-65.
- Havener WH. *Ocular pharmacology*. 5th ed. St Louis: C V Mosby, 1983:433-500.

(Accepted 10 April 1986)

Incidence of inappropriate treatment of herpes simplex keratitis with topical steroids

C M P CLAUOË, KATHERINE E STEVENSON

Topical steroids are applied to the eye for various conditions but they are not without dangers. Side effects include steroid induced glaucoma and cataract. More serious is their inappropriate use in infectious keratitis, particularly as they may enhance herpetic keratitis. The frequency with which this occurs has not been studied recently. We have carried out a large postal survey of ophthalmologists to ascertain the incidence and prognosis of steroid enhanced herpetic keratitis.

Medical practitioners are advised never to prescribe topical ophthalmic steroids without first seeking the opinion of an ophthalmologist

Subjects, methods, and results

A questionnaire was sent to the first 200 ophthalmologists in the 1984 *Medical Register* asking: (1) if they had ever seen inappropriate use of steroid eye drops—and if so how many cases they had seen within one year and how many of these were of herpes simplex eye disease; (2) what proportion of these patients had suffered "significant visual handicap" (a) overall and (b) specifically among those being treated for herpes simplex; (3) whether the problem in their area was becoming more common, less common, or staying the same; and (4) if they would favour general practitioners being advised not to prescribe topical ophthalmic steroids or steroid and antibiotic mixtures except after consultation with an ophthalmologist.

36a Queens Gardens, Bayswater, London W2

C M P CLAUOË, MA, DO, Wellcome Trust research fellow

Moorfields Eye Hospital, London EC1V 2PD

KATHERINE E STEVENSON, DO, FRCS, resident surgical officer

Correspondence to: Dr Clauoë.