

CORRESPONDENCE

'In use' expiry date for eyedrops

EDITOR.—Geyer *et al*¹ found that 8% of their outpatients' antiglaucoma eyedrops and 20% of their tips had been contaminated by microbes (a total of 28%). They concluded that there was a clear correlation between medication contaminated and duration of use (for example, 19% at <4 weeks, 40% at >12 weeks). The sample size, however, differed markedly in each of the groups (for example, 17 in the 4–12 week group, 108 in the <4 week group). In addition, they did not differentiate between the proportion of bottle tip and drop contamination in their groups. They suggested that eyedrops should be replaced regularly to prevent serious ocular infections² though they fail to stipulate what this period should be.

We conducted a small pilot study investigating the contamination of domiciliary 'in use' eyedrops at 1 month. Fifty eight outpatients were asked to bring in their eyedrop medication which they were about to discard at 4 weeks. The samples consisted of glaucoma medication, antibiotics, steroids, antibiotic/steroid combinations, and cycloplegics. All of these contained 0.01% benzalkonium chloride as preservative. The eyedrops were cultured on blood and chocolate agar for a 48 hour period. Fungal growth media were not used. The results failed to demonstrate any growth.

We feel that it is essential to maintain and regulate 'in use' expiry dates. In the UK this currently stands as 28 days for outpatients and 7 days for inpatients. Such formal recommendations do not exist in the United States. The expiry date depicts the safe period for eyedrops, which is obviously influenced by the environment, the frequency, and technique of use. It is our nursing policy that every patient is taught to instil eyedrops adequately before discharge or first commencing treatment as an outpatient. If they fail to meet an aseptic technique then relations, friends, or district nurses are employed.

The British Pharmacopoeia Commission Secretariat first introduced an in use period for eyedrops in 1966 following the results of clinical studies.^{3,4} For outpatients this was stated arbitrarily as 1 month and for inpatients at 1 week. The maximum volume of the multidose bottle was 20 ml which was reduced in 1968 to 10 ml, while the outpatients in use period was reduced to 2 weeks; later this was increased to 4 weeks. The commission set up a working party in 1988 to study multidose ophthalmic products: contamination was reported only as 5% of 608 samples.⁵ The presence of preservative helps maintain this low incidence. Benzalkonium chloride is the most widely used antimicrobial preservative either alone or in combination with others. In the early 1990s the commission introduced the 'Efficiency of antimicrobial preservative in pharmaceutical products' test, which suggested that 1 ml of preservative added to a pharmaceutical product should meet the criterion of a reduction of an inoculum of 10⁶ *Staphylococcus aureus* or *Pseudomonas aeruginosa* organisms by 10⁵ after 24 hours.

We therefore conclude that adhering to such policies as recommended by the British

Pharmacopoeia Commission for in use eyedrop expiry dates and quality of preservative, has resulted in a relatively low incidence of microbial contamination and subsequent microbial keratitis for both inpatients⁶ and outpatients in the UK.

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- 1 Geyer O, Bottone EJ, Podos SM, Schumer RA, Asbell PA. Microbial contamination of medication used to treat glaucoma. *Br J Ophthalmol* 1995; 79: 376–9.
- 2 Schein OD, Wasson PJ, Boruchoff SA, Kenyon KR. Microbial keratitis associated with contaminated ocular medications. *Am J Ophthalmol* 1988; 105: 361–5.
- 3 Crompton DO. Prescribing drops. *Australasian J Pharm* 1962; 43: 1020–8.
- 4 Aycliffe GA, Barry DR, Lowbury EJJ, Roper-Hall MJ, Martin-Walker W. Post-operative infection with *Pseudomonas aeruginosa* in an eye hospital. *Lancet* 1966; 1: 1113–7.
- 5 Davison AL, Hooper WL, Spooner DF, Farwell JA, Baird R. The validity of criteria of pharmacopoeial preservative efficacy tests – a pilot study. *Pharm J* 1991; 246: 555–7.
- 6 Stevens JD, Matheson MM. Survey of the contamination of eyedrops of hospital inpatients and recommendations for changing the current practice in eyedrop dispensing. *Br J Ophthalmol* 1992; 76: 36–8.

Reply

EDITOR.—We appreciate the interest Rauz and colleagues have shown in our published results on microbial contamination of glaucoma eyedrops, and their effort to repeat the study in their population. They found no growth in the cultures of eyedrops used for 4 weeks by outpatients. However, in their study only the drops were cultured whereas in ours the eyedrop bottle tips were also cultured. This fact could have been responsible at least in part for the discrepancy in results between the two studies.

Unfortunately, they appear to have misread the data in Table 5 in our paper. They mention correctly that the sample size in the group that used the drops for less than 4 weeks was 108; however, the sample size in the 4–12 week group is 61 and not 17 as they stated. The difference between the above groups was due to that fact most patients only used the drops for a short time (<4 weeks), and therefore it was difficult to obtain data for longer periods. The proportion of the bottle tip to drop contamination in various time periods is given in Table 1. It appears to be a function of the duration of use, as high as about 4 at <4 weeks and about 1.5 for longer use. It should be noted that we counted the number of tips and drops contaminated separately for the same medications in Table 1 in this letter, as compared with the number of medications contaminated in Table 5 of the paper.

Table 1 Drops and tip contamination and length of time used

Time in use (weeks)	Sample (No)	Contamination	
		Drops No (%)	Tip No (%)
<4	108	5 (4.6)	20 (18.5)
5–8	44	4 (9.1)	7 (15.9)
9–12	17	3 (17.6)	4 (23.5)
>12	25	4 (16.6)	7 (28)

We do agree with Rauz and colleagues that an in use expiration date is essential to reduce microbial contamination of eyedrops. Since a dramatic increase in eyedrop contamination appeared after week 8 in our study, we suggest replacing all topical medications regularly after this lapse of time. Making the patient aware of frequency and technique of use is certainly an additional method of preventing contamination of eyedrops and the potential for infectious complications.

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NOTICES

Royal Society of Medicine, Section of Ophthalmology

The following meetings (beginning at 5 pm) are open to RSM members and their guests only.

LANG LECTURE, 14 March 1996
New perspective; corneal grafting Professor David Easty.

NEW HORIZONS IN THERAPEUTICS, 9 May 1996

The identification of human tumour antigens: a strategy for developing tumour vaccines; New developments in the management of CMV retinitis; The development of ophthalmic drugs; The challenge of gene therapy in the context of eye diseases.

Further details: Alyson Taylor, Sections Officer, Royal Society of Medicine, 1 Wimpole Street, London W1M 8AE. (Tel: 0171 290 2985; fax: 0171 290 2989.)

REGISTRARS' MEETING, 13 June 1996, 2 pm
For registrars to present research work and case reports. Papers to be considered for publication. Abstracts should be submitted (max 200 words) for the attention of P Murray, The Royal Society of Medicine, 1 Wimpole Street, London W1M 8AE. Closing date for entries is 12 April 1996.

First European Forum on Quality Improvement in Health Care

The first European forum on quality in health care will be held on 7–9 March 1996 at the QEII Conference Centre, London. Further details: Clare Moloney, BMA Conference Unit, BMA House, Tavistock Square, London WC1H 9JP. (Tel: 0171–383 6663; Fax: 0171–383 6478.)

XIth Symposium of the International Society for Genetic Eye Disease and VIIIth Symposium of the Retinoblastoma Society

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