LETTERS TO THE EDITOR

Acanthamoeba and contact lens disinfection: should chlorine be discontinued?

EDITOR,—Two presentations of *Acanthamoeba* keratitis associated with 'disposable' contact lens wear have been recorded in Glasgow within the last year. *Acanthamoeba* was cultured from the corneas of both patients after biopsy. In addition *Acanthamoeba* was isolated from the contact lens storage cases of both patients. In each instance, the patients had used a chlorine-based system to attempt disinfection of their contact lenses.

Others have isolated *Acanthamoeba* from two of nine lens cases exposed to disinfection with chlorine-based lens cleaning systems; *Acanthamoeba* was not isolated from 35 cases disinfected using chlorhexidine and 20 cases using hydrogen peroxide.¹ One of 18 cases disinfected using an unidentified disinfectant contained *Acanthamoeba*, as did three of 19 cases which used 'heat'. This latter study also provided data which reinforce the notion of Lowe and colleagues² that there is a greater relative risk of residual bacterial growth, a prerequisite for nutrition of amoebae, within the lens cases if chlorine rather than hydrogen peroxide is used as the disinfectant.

Although available commercially as Softab (sodium dichloroisocyanurate) and Aerotab (hazalone) there are grounds for doubting the value of chlorine as an anti-*Acanthamoeba* disinfectant. *Acanthamoeba* trophozoites are sensitive to 1.25 mg/l available free chlorine³ but cysts appear more resilient. These can resist a free available chlorine concentration of at least 50 mg/l, derived from a solution of sodium hypochlorite.⁴ Cysts also survived in a concentration of 5 mg/l free available chlorine generated from Aerotab tablets.⁵ No published data are currently available relating to the specific effects of sodium dichloroisocyanurate on *Acanthamoeba* trophozoites or cysts.

The general failure of most commercially available chemical disinfectant systems to guarantee uniform killing of *Acanthamoeba*, within a reasonable time period, could be overcome by replacing the reusable and usually contaminated lens storage case with a sterile disposable one.⁶ Furthermore, the increasing prevalence of microbial keratitis with 14-day wear 'disposable' lenses, and recognition of *Acanthamoeba* infection associated with them, highlights the requirement for a sterile disposable case for the reusable a 'disposable' lens. Lack of compliance with recommended lens disinfection procedures, especially by younger wearers who use contact lenses principally for cosmetic purposes, has been identified as a further factor which enhances the risk of keratitis. Wearers may not perceive the need for good hygiene since a 'disposable' lens is being used. Medical practitioners and optometrists should consider these factors when advising patients on contact lens wear and hygiene.

An alternative approach to reduce contamination and enhance eradication of *Acanthamoeba* cysts and other microbes involves daily washing of the lens case with hot (>70°C) boiled water from the domestic kettle, followed by storage in a dry state.⁷ The micro-

biocidal effect of this process means that the subsequent activity of efficacious chemical disinfectants, such as hydrogen peroxide, is not compromised by contamination, but is dependent only upon contact time with the lens, to which amoebal cysts adhere, and penetration of any associated biofilm. Under such conditions sterility of the contact lens would be assured.

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Corneal diameter in premature infants

EDITOR,—The paper by Al-Umran and Pandolfi¹ contains valuable information, but appears from some material points of view incomplete. It is not altogether surprising that the corneas, like most parts of premature infants, should be smaller than those of full-term ones. In fact, the subject was first studied almost 70 years ago,² and the data for premature cadaver corneas neatly fit into measurements obtained on living eyes.³ Al-Umran and Pandolfi's measurements are also consistent with earlier data.³

What is more recent in the work by Al-Umran and Pandolfi is their attempt to link corneal measurements to the high incidence of congenital glaucoma in Saudi Arabia. It would appear that this has not yet succeeded for at least two reasons.

In the first place, they have not attempted to relate the size of the cornea to other ocular components. It is arguable that a mechanical role played by a (premature) cornea may depend on its curvature, which decreases steeply during the last weeks before full term.³ Again, information on the depth of the anterior chamber, more likely to be affected by corneal curvature than by corneal diameter, could also be relevant. In short, since both the cornea and the eyeball grow log linearly right up to full term, it is hard to see at present what aetiological role corneal size can play.

The second reason is the lack of any clinical follow up. What is needed now is information on the incidence of congenital glaucoma amongst the cases examined by Al-Umran and Pandolfi and a comparison of this with results obtained for the incidence in (a) full-term babies, and (b) babies born with normal corneal

diameters. These two pieces of information would complete a very important study.

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Reply

EDITOR,—We were intrigued to learn from Dr Weale that the corneal diameter in premature cadavers was being measured as early as 1925. It would be interesting to know whether before measurement these eyes were cannulated and perfused at physiological pressure since post-mortem hypotony is likely to alter the geometry of the globe. Anyway Dr Weale makes a useful reminder—that is, it pays to examine the old literature.

The aim of our investigation was purely to provide a set of 'normal' values useful to answer the question: is the corneal diameter of a given premature infant too large and consequently shall one suspect a congenital glaucoma in this child? We did not attempt to correlate the corneal diameter with the high incidence of primary infantile glaucoma in Saudi Arabia. The children examined were healthy and none has subsequently developed glaucoma.

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BOOK REVIEWS

Recent Advances in Ophthalmology Eight. Eds S I Davidson, B Jay. Pp 224. £62.95. Churchill Livingstone: Edinburgh, 1992.

It is always a pleasure to read concise, up to date information written by people who know what they are talking about. Sidney Davidson and Barrie Jay have succeeded admirably in drawing together a collection of mini reviews covering areas in ophthalmology which are developing particularly rapidly at present.

Chapters cover aspects of oculoplastic surgery, contact lenses, corneal transplant, intraocular lens complications, therapy of open angle glaucoma, automated perimetry, uveitis, retinopathy of prematurity, pneumatic retinopathy, proton beam irradiation of choroidal melanomas, and molecular genetics. Each chapter has been written by one or more well known figures from the United Kingdom or the United States. The results of laboratory research have been blended with clinical