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Sir,

Intracameral 0.5% phenylephrine—a safe solution?

Gurbaxani and Packard[1] advocate the use of intracameral phenylephrine for the prevention of floppy iris syndrome in patients on tamsulosin. Although no adverse effects have been reported, to date there are no data on the safety of the solution. The recommended method of constitution is dilution of a 0.5 ml Minims® 2.5% phenylephrine hydrochloride with 2 ml balanced salt solution (BSS).[1]

All fluids and medications introduced into the eye carry the potential for complications, such as toxic endothelial cell destruction syndrome, toxic anterior segment syndrome and endophthalmitis. Toxicity to the endothelium has been linked to substances based on pH, osmolality and chemical composition. Through a 3 h exposure time, no deleterious effects on corneal endothelium result from exposure to intraocular solutions with a pH between 6.5 and 8.5, with the necessary ions for maintenance of endothelial function, that is, Na, K, Cl, Ca and Mg.[2] All these are present in the standard preparation of BSS. Manipulation of the pH of the anterior chamber outside this range is probably still acceptable, as long as the exposure time is sufficiently short to balance the magnitude of the alteration.[2] We measured the pH of the 0.5% phenylephrine solution at 5.8.

The corneal endothelium can tolerate a wide range of solution osmolalities (200–400 mOsm) without marked endothelial cell breakdown.[3] The osmolality of the solution was measured at 300 mOsm/kg, which is well within this range. Phenylephrine (1.5%) demonstrates no signs of anterior segment toxicity when used intracamerally.[4] The more dilute, 0.5% solution should therefore be equally safe. However, in addition to phenylephrine, the commercially available Minims® contain purified water, 0.1% sodium metabisulphite, a preservative stabilizer, and 0.05% disodium edetate. Corneas perfused with 0.05% sodium bisulphite demonstrated no functional or ultrastructural endothelial changes.[5] The recommended fivefold dilution of the Minims® would render the concentration of the preservative 0.02%, further increasing the margin of safety.

The pH of 0.5% phenylephrine solution is relatively acidic, but should be sufficiently safe for intracameral use, as long as due care is taken to avoid prolonged exposure times.

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Sir,

Reply to Tinley and Blates

We congratulate Tinley and Bates on their excellent safety study on the use of intracameral phenylephrine (PE). Ideally, a drug that is intended for intracameral use should be free of any preservative, but when this is not available, as in our study, a safe and practical alternative must be sought.

The exposure time of intracameral PE is seconds between the instillation of the drug and the injection of viscoelastic. It is extremely unlikely that even the slightly acidic PE solution would cause any endothelial damage. It would be very difficult to quantify the endothelial cell damage as the drug is used just before a surgical procedure that is known to induce endothelial cell loss.

Tinley and Bates have established that our preparation is indeed a safe and viable drug to use in the eye, especially with the low concentration that we have

recommended. Until a preservative free PE is available, we continue to recommend our preparation.

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Sir,

Treatment of macula-on retinal detachments

We have read with concern two articles published in Eye recently that advocate delay in the treatment of macula-on retinal detachments.[1,2] In a letter, Prasad[1] asserts that 'best evidence indicates that there is no benefit in urgent surgery as long as scheduled surgery can be performed within 7–10 days'. We are concerned that he has misread his supporting references, which are concerned with visual recovery in macula-off retinal detachments, including one entitled 'visual recovery in macula-off retinal detachments'.[3]

We agree that once the macula is off, a delay of 7–10 days will not affect visual outcome. If the macula is on, the body of evidence suggests that visual outcomes are better when operations are performed before the macula detaches. Salicone *et al*[4] demonstrated macular detachment as the most important prognostic factor for anatomical ($P = 0.031$) and visual success ($P \leqslant 0.001$) in detachment surgery.

The second article by Ho *et al* seeks to establish the likelihood of, and risk factors associated with, the progression of macula-on retinal detachments.[2] The authors qualify their results with a number of study weaknesses that render meaningful conclusions virtually impossible, apart from the finding that if the macula is just about to come off it may well do so in the very near future. That the majority of patients with macula-on retinal detachments do not become macula-off before surgery does not mean that it is acceptable for some patients to lose vision because of undue delay.

In a recent survey, a majority of vitreoretinal surgeons stated that they would not support in a court of law the actions of a colleague who did not operate on macula-on retinal detachments in a timely fashion and whose patients lost vision as a consequence.[5] Even if supporting opinion could be found, judges can and do disregard expert evidence that appears to them to be unreasonable. We recommend that any ophthalmic surgeon without the facility to operate at a weekend on macula-on retinal detachments should refer such patients to a unit that has appropriate facilities.

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Sir,

Reply to Scott and Kirkby

I agree with Scott and Kirkby that current opinion among UK ophthalmologists favours emergency surgery for macula-on detachments. However, there is little, if any, scientific evidence to support this widely held 'mantra'. Published studies overwhelmingly support the view that there is no detrimental effect in delaying re-attachment surgery for a few days of presentation of a macula-on detachment, even if the macula does detach for a short while before surgery is undertaken.

Scott and Kirkby contend that I have misread my references.[1,2] If they read beyond the title of the article I supposedly misquoted,[2] it would become clear that this report specifically addresses macula-off detachments where the macula was determined to have come off within the last 7 days. This is exactly what we are trying to address here. In other words, if the macula does come off for a day or two while awaiting surgery for a detachment that presented with the macula-on, does this lead to a worse outcome? Ross and Kozy[2] conclude that if surgery takes place within seven days of the macula coming off, there is no adverse effect on visual outcome. Scott and Kirby subsequently quote Salicone *et al*'s[3] publication purporting that this supports the need for emergency surgery. This report actually concludes that emergency surgery does not influence visual outcome. The concluding paragraph of their report states that 'This study reaffirms the prognostic importance of macular detachment on final visual acuity, but supports the hypothesis that a few days' margin until repair has no impact on visual acuity.'

It is possible to operate out of hours, but it is arguable whether the quality of surgery in this setting would be as good as that performed as an urgent but scheduled event, for reasons I have stated before. In the absence of credible evidence, Scott and Kirkby marshal opinion and the threat of litigation as reasons to advocate emergency surgery. Surely scientific evidence must take precedence over opinion and threat of litigation in guiding clinical