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Sir,
Intracameral 0.5% phenylephrine—a safe solution?
Gurbaxani and Packard¹ 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 Bates

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