Sir,

Effect of cold BSS *vs* naphazoline 0.025% on ocular surface temperature

Topical vasoconstrictors are widely used for the relief of red eyes. Systemic side effects are due to their sympathomimetic activity, and may lead to arrhythmias, systemic hypertensive crisis, and angle closure glaucoma. Local side effects are mainly attributed to the preservative benzalkonium chloride and include irritation, discomfort, lacrimation, punctate keratitis, and cytotoxicity.[1,2] Chronic use may lead to rebound hyperaemia and persistent redness of the eyes. Conjunctival hyperaemia is associated with increase in ocular surface temperature.[3]

The main purpose of this study was to assess the effects of topical cold (4°C) balanced salt solution eyedrops (BSS) and to compare them with the effects of topical naphazoline hydrochloride 0.025% eye drops (20°C) on the ocular surface temperature (OST).

We enrolled 30 consecutive patients with noninfectious conjunctivitis and normal tear production. We excluded patients with previous ocular surgery or patients on topical or systemic medications. The right eye of each patient was randomized to receive either cold BSS or naphazoline, while the left eye received the other drop. OST was measured over the inferotemporal bulbar conjunctiva while having the patient look at the opposite side. The ocular surface thermometer (ThermoScan® by Braun, type 6013, Kronberg, Germany) was held at about 0.5 cm from the eye. Three measurements were taken at each time point. The mean of the three was recorded. Readings were taken before, 10 min, 1, 2, and 3 h after instilling the eyedrops.

There were 13 male and 17 female patients. The average age was 25 years with a range of 17–42 years. OST measurement results are shown in Table 1. There was a significant decrease in mean OST compared to baseline as early as 10 min after installation of the cold BSS drops. This statistically significant decrease persisted at all points in time in the cold BSS group. While in the naphazoline group, the decrease in OST compared to baseline was observed only at 1 and 2 h after installation and disappeared after that. The difference compared to baseline was not significant at any point in time in this group. The difference in temperature reduction between cold BSS and naphazoline at each point in time was not significant at 10 min and at 1 h but was significant at 2 and 3 h. The final OST value was significantly lower than baseline in the cold BSS group but not in the naphazoline group (see Figure 1).In this study, we observed that topical use of cold BSS preservative-free eyedrops led to a significant decrease in ocular surface temperature, which may be due to the constriction of conjunctival blood vessels. This cooling effect was maintained for up to 3 h after a single installation. This was compared to naphazoline. Naphazoline demonstrated a decrease in OST, which was significantly less than cold BSS and short lived with a marked rebound in OST. The frequent use of cold BSS eyedrops was not associated with any ocular surface toxic effects. This is exfpected since cold BSS contains no preservatives and no toxic chemicals. It would be reasonable to suggest that cold commercially available preservative-free artificial tears may prove to be as effective as cold BSS. In cases of nonspecific or mild allergic conjunctivitis, cold BSS or cold artificial tears may be as effective as topical vasoconstrictors. However, further clinical trials are required to support this.

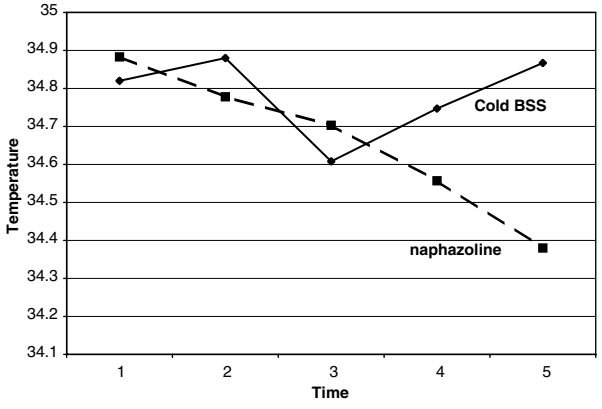

Figure 1 Ocular surface temperature *vs* time.

Table 1 OST following Cold BSS and naphazoline 0.025% compared to baseline and to each other

Time	*Cold BSS* vs *baseline*		*Naphazoline* vs *baseline*		*Cold BSS* vs *naphazoline* P-*value*
	Mean	*Difference* (P-*value*)	*Mean*	*Difference* (P-*value*)	
Baseline	34.883	—	34.820	—	0.6416
10 min	34.778	−0.105 (0.0085)	34.880	0.060 (0.0434)	0.3792
1 h	34.703	−0.180 (0.0047)	34.608	−0.212 (0.1128)	0.1841
2 h	34.557	−0.273 (0.0002)	34.747	−0.073 (0.4811)	0.0044
3 h	34.380	−0.503 (<0.0001)	34.867	0.047 (0.5722)	<0.0001

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Sir,

Failure of imaging to detect optic nerve avulsion: an explanation based on histopathology

A 26-year-old man was struck in his unprotected left eye by a paintball and noted immediate, complete vision loss. The paintball did not burst upon impact.

Visual acuities were 20/20 OD and no light perception OS. The right eye was normal. The left eye demonstrated incomplete ophthalmoplegia, an afferent and efferent pupillary defect, chemosis, corneal oedema, a small hyphaema, and iridodialysis. Fundus examination revealed vitreous haemorrhage, obscuring the optic nerve, and a giant retinal tear. Ultrasonography (Figure 1) and orbital magnetic resonance imaging (MRI, Figure 2) utilising T1, T2, and fat-suppression techniques demonstrated no abnormality of the optic nerve.

The patient underwent enucleation the following week for a blind painful eye. The optic nerve sheath remained attached to the intact globe with no apparent injury to the optic nerve. Histology revealed avulsion of the optic nerve head (posterior dislocation of the lamina cribrosa). Blood filled the cavity left by the avulsed nerve within the intact dural sheath (Figure 3).

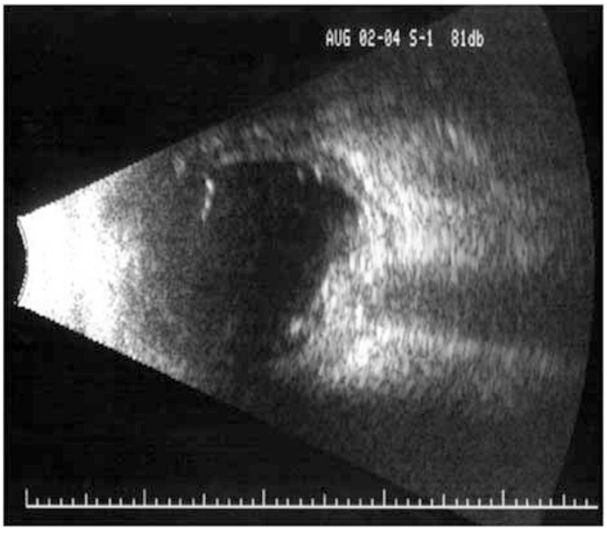

Figure 1 Retrobulbar optic nerve appears normal on ultrasonography (B scan, 10 MHz).

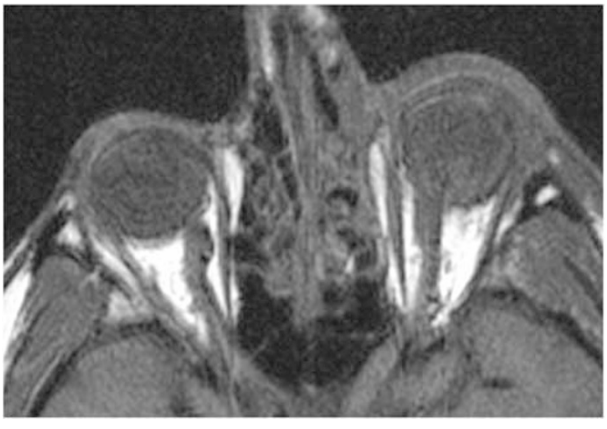

Figure 2 Retrobulbar optic nerve appears normal on MRI (high resolution, axial T2 weighted image).