brimonidine usage with a secondary rise in IOP and responds well to stopping the drug and steroid eye drops.

References

1. British National Formulary. London: British Medical Association and The Royal Pharmaceutical Society of Great Britain, September 1999:469.
2. Toris CB, Gleason ML, Camras CB, *et al.* Effects of brimonidine on aqueous humor dynamics in human eyes. Arch Ophthalmol 1995;113:1514–7.
3. Moorthy RS, Valluri S, Jampol LM. Drug induced uveitis. Surv Ophthalmol 1998;42:557–70.
4. Melles R, Wong I. Metipranolol-associated granulomatous iritis. Am J Ophthalmol 1994;118:712–5.
5. Fechtner RD, Khouri AS, Zimmerman TJ, *et al.* Anterior uveitis associated with latanoprost. Am J Ophthalmol 1998;126:37–41.
6. Naranjo CA, Busto U, Sellers EM, *et al.* A method for estimating the probability of adverse drug reactions. Clin Pharmacol Ther 1981;30:239–45.

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Sir,

Pupil function after phacoemulsification and extracapsular cataract surgery

Nuclear expression during extracapsular cataract surgery is often associated with overstretching of the pupil sphincter. During extracapsular cataract extraction (ECCE), nucleus expression and insertion of larger-diameter posterior chamber intraocular lens (PC-IOL) implants can cause significant surgical trauma to the sphincter pupillae, particularly when the pupil is poorly dilated.

Phacoemulsification by means of *in situ* nuclear fragmentation and insertion of small-diameter PC-IOL avoids the need for nuclear expression and therefore peroperative iris trauma. This may result in better pupillary function post-operatively. Gibbens *et al.*[1] compared pupillary function after intracapsular and extracapsular surgery and found significantly compromised pupil function in the intracapsular group. Pupil function following phacoemulsification has not been the subject of much previous investigation.

We prospectively studied pupillary function after phacoemulsification and ECCE with PC-IOL implantation by measuring pupil diameters in dark and bright illumination and after 60 min of mydriasis with tropicamide 1% and phenylephrine 10% using static infrared photography. Twenty-nine eyes of 29 patients undergoing cataract surgery by phacoemulsification (20) or ECCE (9) were included. Exclusion criteria for the study were: previous intraocular inflammation, trauma, other intraocular surgery, presence of any ocular disorder and systemic disease or medication influencing pupil function. Accommodation was controlled by having the subjects fixate on a small illuminated target 6 m away.

An indirect ophthalmoscope provided the bright illumination. A Nikon camera with a 60 mm Nikon micro-lens was adapted to take static infrared photographs on a high-speed Kodak infrared film. The processed negatives were projected with an angioprojector at a ×10 magnification. A masked observer recorded pupillary diameters in horizontal and vertical meridians. An unpaired *t*-test was used for the comparison of the pupil diameters between the phacoemulsification and the ECCE group.

The mean age of the patients was 67.3 years and 70 years in the ECCE and phacoemulsification groups respectively. There was no significant difference between the pre-operative pupillary diameter in the two groups in the dark ($p = 0.4$) and light ($p = 0.2$) and after mydriasis ($p = 0.8$). Following phacoemulsification, the dilated pupil diameter was smaller (7.3 mm vs 6.9 mm, $p = 0.01$) compared with baseline. There was no significant change in the pupil diameter in the dark (4.6 mm vs 4.5 mm, $p = 0.71$) and the light (2.4 mm vs 2.5 mm, $p = 0.35$). Following ECCE, there was a significant difference in the dilated pupil diameter (7.2 mm vs 6.7 mm, $p = 0.03$) and in bright illumination (2.1 mm vs 2.7 mm, $p = 0.009$).

Intraocular surgery, though calculated and planned, may still subject the iris to various degrees of mechanical stress which may manifest itself as post-operative abnormalities of pupil shape and motility. This preservation of pupil constriction after phacoemulsification is probably due to reduced sphincter pupillae trauma peroperatively.

Both ECCE and phacoemulsification with intraocular lens implant result in a statistically significant reduction in maximal pupil dilation in response to mydriatic agents. The physiological pupil diameter in the dark is unaffected by surgery in either group of patients. Physiological pupil constriction in response to bright light is, however, significantly reduced after ECCE, whilst it remains preserved after phacoemulsification. The reduction in mydriatic pupil dilation post-operatively after ECCE is unlikely to be of clinical significance.

References

1. Gibbens MV, Goel R, Smith SE. Effect of cataract extraction on the pupil response to mydriatics. Br J Ophthalmol 1989;73:563–5.

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