

Commentary: Intracameral mydriatics in cataract surgery

Adequate mydriasis is crucial for any cataract surgery. The incidence of complications increases in a poorly dilated pupil. Conventionally, the pupil is dilated with a standard regime of topical drops (diluted for infants), given preoperatively starting a few hours before surgery. Topical drops have reduced penetration and take time to have their peak effect.^[1,2] Therefore, a larger dose with repeated applications is required. This is supplemented with adrenaline in the irrigating fluid to maintain mydriasis. These drugs are absorbed into systemic circulation and can cause systemic cardiovascular and pulmonary side effects. These systemic side effects of topical mydriatics are more pronounced in children.^[3,4]

An alternative method to dilate the pupil is the use of intracameral mydriatics. There have been numerous studies on the use of this solution during cataract surgery.^[1,5-7] It would be well worthwhile exploring its role in a well-designed study on small-incision cataract surgery where a larger pupil is required for anterior capsulorhexis and expressing the lens. The use of intracameral injection can obviate the need for topical drops and their associated side effects. The efficacy and safety of a fixed dose intracameral combination of phenylephrine (0.31%), tropicamide (0.02%), and lidocaine (1%) in phacoemulsification is already established in adults.^[5-7] The formulations have been proven to be effective and are a safe alternative to the standard topical regime for establishing and maintaining intraoperative mydriasis and analgesia. It has been shown to be effective in floppy iris syndrome. Not only are they efficacious, but they are also reportedly comfortable to an adult patient.^[7,8] The effect of lidocaine in causing paralysis of the iris sphincter and decrease in pain might contribute to maintaining pupil stability. Pupils might be larger initially, but intraoperative miosis is more common and unpredictable with topical dilators. Sustained mydriasis is more critical to surgeons than the “maximum” size achieved.

Intraoperative miosis is a well-known problem with topical dilators.^[5] These are more pronounced in children and in patients with diabetes and pseudoexfoliation.

In a pediatric age group, risk of poor mydriasis and intraoperative miosis is much higher compared to adults. Intracameral mydriatics have shown to be effective in dilating and maintaining the pupil size in children without any unexpected inflammatory sequelae.^[9] The average pupillary dilation achieved (6.2 mm) was comparable to that reported (6.5–7.5 mm) in adults. Even when intraoperative miosis occurs with topical drops, intracameral dilators come to the rescue. Repeat injections do not have any additional effect on pupillary dilatation, possibly because of competitive binding of the iris receptors.

There are several advantages of using intracameral mydriatics over topical drugs. Apart from systemic side effects, topical mydriatics can cause ocular side effects from the preservatives. There is targeted delivery of the drug when using it as an injection without having to pass through the corneal barrier. Patient comfort increases with added local anesthesia when operating under topical anesthesia. In children, it is a safe option for those allergic to atropine. It is cost-effective compared to drops and improves operating room logistics. Thus, this

combination could provide advantages of stable mydriasis and greater surgeon and patient comfort intraoperatively.

Kiran Kumari, Savleen Kaur, Jaspreet Sukhija

Advanced Eye Centre, Post Graduate Institute of Medical Education and Research, Chandigarh, India

Correspondence to: Prof. Jaspreet Sukhija,
Advanced Eye Centre, PGIMER, Sec 12, Chandigarh, India.
E-mail: jaspreetsukhija@rediffmail.com

References

- Lundberg B, Behndig A. Intracameral mydriatics in phacoemulsification cataract surgery. *J Cataract Refract Surg* 2003;29:2366-71.
- Chien DS, Schoenwald RD. Ocular pharmacokinetics and pharmacodynamics of phenylephrine and phenylephrine oxazolidine in rabbit eyes. *Pharm Res* 1990;7:476-83.
- Elibol O, Alçelik T, Yüksel N, Çağlar Y. The influence of drop size of cyclopentolate, phenylephrine and tropicamide on pupil dilatation and systemic side effects in infants. *Acta Ophthalmol Scand* 1997;75:178-80.
- Wyganski-Jaffe T, Nucci P, Goldchmit M, Mezer E. Epileptic seizures induced by cycloplegic eye drops. *Cutan Ocul Toxicol* 2014;33:103-108.1-5.
- Chiambaretta F, Pleyer U, Behndig A, Pisella PJ, Mertens E, Limao A, *et al.* Pupil dilation dynamics with an intracameral fixed combination of mydriatics and anesthetic during cataract surgery. *J Cataract Refract Surg* 2018;44:341-7.
- Lundberg B, Behndig A. Intracameral mydriatics in phacoemulsification cataract surgery – A 6-year follow-up. *Acta Ophthalmol* 2013;91:243-6.
- Labetoulle M, Findl O, Malecaze F, Alió J, Cochener B, Lobo C, *et al.* Evaluation of the efficacy and safety of a standardised intracameral combination of mydriatics and anaesthetics for cataract surgery. *Br J Ophthalmol* 2016;100:976-85.
- Labetoulle M, Behndig A, Tassignon MJ, Nuijts R, Mencucci R, Güell JL, *et al.* Safety and efficacy of a standardized intracameral combination of mydriatics and anesthetic for cataract surgery in type-2 diabetic patients. *BMC Ophthalmol* 2020;20:81.
- Kaur S, Korla S, Ram J, Gupta PC, Sukhija J. Intracameral anesthetic mydriatic (ICAM) assisted pediatric cataract surgery. *Eur J Ophthalmol* 2022;32:1157-62.

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

Access this article online	
Quick Response Code:	Website: www.ijo.in
	DOI: 10.4103/ijo.IJO_2236_22

Cite this article as: Kumari K, Kaur S, Sukhija J. Commentary: Intracameral mydriatics in cataract surgery. *Indian J Ophthalmol* 2022;70:3853.