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Intraocular pressure reduction after cataract extraction in normal eyes: influence of ethnicity and anterior segment parameters - response

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We thank Ngo and Tan for their interest in our article examining the effect of ethnicity and anterior segment parameters on intraocular pressure (IOP) reduction following phacoemulsification cataract extraction.¹ It has been brought to our attention that a prior study by Pohjalainen et al. reported IOP reduction by a mean of 13.2% at four months, and 21.2% at the final follow up visit, which occurred between 1 to 2.7 years after surgery.² These results suggest that peak IOP lowering effect may occur after 3 months. We agree that potential differences in IOP reduction between ethnic groups might manifest later than 3 months postoperatively and a more extensive follow up schedule is warranted to confirm our findings. In addition to a more extensive follow up schedule, future studies should also examine the association between ethnicity and phacoemulsification-induced changes in anterior segment parameters that have not been examined in our study, such as iris thickness, iris curvature, pupil diameter, anterior chamber area, and anterior chamber width.

In addition, Ngo and Tan describe results from their patients in which IOP reduction is not greater in narrow versus open angle subjects. Our study, as well as prior studies, has supported the idea that improved access to the trabecular meshwork—i.e., greater opening of the angle—is the main mechanism by which IOP is reduced.³ However, the findings from Ngo and Tan support an alternative theory that enhanced function of the trabecular meshwork may play a role in IOP reduction following phacoemulsification. Wang *et al.* demonstrated that interleukin-1 alpha could be induced by phacoemulsification ultrasound energy.⁴ Interleukin-1 alpha, an inflammatory cytokine, has been shown to decrease IOP in human anterior segment tissue culture.⁵ Therefore, IOP reduction following phacoemulsification may be only partially mediated by anatomic changes in the anterior chamber. It is possible that IOP reduction after phacoemulsification is multifactorial.

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References

1. Lee RY, Kasuga T, Cui QN, Huang G, Wang SY, Lin SC. Ethnic differences in intraocular pressure reduction and changes in anterior segment biometric parameters following cataract surgery by phacoemulsification. *Clin Experiment Ophthalmol*. 2013; 41:442–9. [PubMed: 23146132]
2. Pohjalainen T, Vesti E, Uusitalo RJ, Laatikainen L. Intraocular pressure after phacoemulsification and intraocular lens implantation in nonglaucomatous eyes with and without exfoliation. *J Cataract Refract Surg*. 2001; 27:426–31. [PubMed: 11255056]
3. Huang G, Gonzalez E, Peng PH, Lee R, Leeungurasatien T, He M, Porco T, Lin SC. Anterior chamber depth, iridocorneal angle width, and intraocular pressure changes after phacoemulsification: narrow vs open iridocorneal angles. *Arch Ophthalmol*. 2011; 129:1283–90. [PubMed: 21987670]
4. Wang N, Chintala SK, Fini ME, Schuman JS. Ultrasound activates the TM ELAM-1/IL-1/NF-kappaB response: a potential mechanism for intraocular pressure reduction after phacoemulsification. *Invest Ophthalmol Vis Sci*. 2003; 44:1977–81. [PubMed: 12714632]
5. Bradley JM, Vranka J, Colvis CM, et al. Effect of matrix metalloproteinases activity on outflow in perfused human organ culture. *Invest Ophthalmol Vis Sci*. 1998; 39:2649–2658. [PubMed: 9856774]