Should intracameral triamcinolone acetonide become a mainstay in infantile cataract surgery?

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Congenital cataracts are the leading cause of preventable blindness in children [1]. Well-timed surgical intervention may prevent deprivation amblyopia and result in good visual prognosis [2]. Despite advancements in the estimation of refractive outcome, surgical management, and the postoperative control of myopic shift and rehabilitation [3, 4], late adverse events may jeopardize the result of the initial treatment [5, 6].

Proper reduction of inflammation is pivotal after pediatric cataract surgery—especially in infantile cases—as in these eyes the lack of mature blood-ocular barrier results in intense fibrinous inflammatory response to surgical stimuli [7, 8]. Postoperative complications arising from intense inflammation include formation of fibrous pupillary membrane, posterior synechiae, and posterior capsule opacifications. Furthermore, surgical management of infantile cases provokes the risk of glaucoma [9].

Reinforced anti-inflammatory medication has become the mainstay of pediatric cataract surgery, yet there is no consensus on which of the anti-inflammatory protocols give desirable efficacy without prohibitively predisposing to the risk of IOP rise. Chou et al. discovered in their meta-analysis that intracameral preservative-free triamcinolone acetonide (TA) reduced the odds ratios for cell deposits, posterior synechias, fibrous anterior chamber reaction, visual axis obscuration, and

posterior capsule opacification in non-uveitic pediatric cataracts without any severe ocular adverse events when compared with patients not receiving intracameral TA. Interestingly, the postoperative level of intraocular pressure remained within the physiological range. These favorable outcomes were discussed to arise from dual effects of intracameral TA; both visualization of vitreous body in TA-assisted anterior vitrectomy and prolonged anti-inflammatory response. The authors showcase their meticulous approach to the evaluation of the studies chosen, the randomized clinical trials (RCTs) among the others, by employing the Cochrane Collaboration tool, which tends to provide the strong reliability and accuracy of their findings. Any discrepancies on methodological issues were discussed with a third expert. The authors dexterously use the fixed-effects versus the random-effects meta-analytical models, giving weight to the assessments of heterogeneity and bias.

Without disparaging the merits of the comprehensive meta-analysis, it remains important to acknowledge the several safety aspects missing that need to be addressed before these encouraging findings can be generalized for the purpose of clinical practice recommendations e.g., in Current Care Guidelines. First, it will be important to address the kinetics of IOP within the first postoperative months. Here, the follow-up focused on IOP at 1 month and beyond 6 months (in two of the studies at 6 months and in three of the studies at 12 months). Within the timeframe, the results indicated recovery from significant IOP rise in the eyes receiving intracameral TA towards the levels of those receiving topical steroids. Second, age is a crucial factor in terms of postoperative inflammatory responses and late adverse events. In this respect, it would be important to stratify the cases according to the age of the patients (for instance from 4 weeks to 6 weeks, 6 weeks to 6 months, 6 months to 2 years, > 2 years) [10]. Taking into account that four out of five studies concentrated on congenital cataracts and the mean age of intracameral TA recipients ranged between the studies from 2.4 ± 2.1 months to 10.45 ± 6.22 months, we can conclude that the majority of the cases

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represent children at preverbal age. Third, discussion on the occurrence of late adverse events (i) in relation to TA doses ranging from 1.2 to 2 mg (not available for all the studies) and (ii) between the studies using 2-time and 3-time standardized applications and those administering TA at the end of the surgery may be important viewpoints.

To avoid undesirable secondary interventions in pediatric cataract surgery, a steady and prolonged reinforced anti-inflammatory treatment protocol with a proper safety profile is warranted. Multiple steroid delivery methods for adult cataract surgery have been proposed, each one having its advantages and disadvantages [11]. TA is a moderate-strength corticosteroid with a relatively long duration of action. Intraoperative preservative-free TA depot glucocorticoid with insoluble particles is a fascinating alternative to avoid issues of incompliance [12, 13]. A subconjunctival injection has been shown to result in higher aqueous and vitreous steroid concentrations than eye drops, parabolbar injection, or oral administration [14, 15]. Unlike with the aforementioned delivery methods or with transzonular injection of compounded formulation, subconjunctival TA administration enables feasible management of a potential steroid-induced IOP rise by surgical excision of the depot [11, 16–19]. Further investigations are needed to optimize the timing, composition, route of delivery, and dosage of anti-inflammatory drug protocols in pediatric cataract surgery.

Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

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