Acute Endophthalmitis Incidence

Intravitreal Triamcinolone

Andrew C. Westfall, MD; Alexander Osborn, PhD; Derek Kuhl, PhD, MD; Matthew S. Benz, MD; William F. Mieler, MD; Eric R. Holz, MD

Objective: To report the incidence of acute postinjection endophthalmitis following intravitreal injection of triamcinolone acetonide (IVTA) as an office procedure.

Methods: Retrospective, noncomparative, consecutive, interventional case series of all patients who had received IVTA at 2 clinical centers between January 1, 2000, and January 30, 2004.

Results: A total of 1006 eyes received IVTA. None of the eyes developed acute, culture-positive, postoperative endophthalmitis in the 6 weeks following the procedure. One patient developed acute, culture-negative, postoperative endophthalmitis 4 days after receiving IVTA, resulting in an incidence of 0.10%. In this case, the presenting symptoms were decreased vision and acute conjunctival erythema. The case was notable for the absence of pain or hypopyon.

Conclusion: Although acute postoperative endophthalmitis may follow IVTA, our experience suggests that this is a relatively uncommon event.

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THE INTRAVITREAL USE OF TRIamcinolone acetonide (IVTA) has become increasingly popular. Indications for injection either alone or in combination with photodynamic therapy include macular edema due to diabetes mellitus, retinal vein occlusion, and uveitis, as well as exudative age-related maculopathy.[1-11] The procedure has several well-recognized risks including elevated intraocular pressure, cataract progression, and endophthalmitis.[12-20] One recent report suggests that the incidence of culture-positive endophthalmitis following IVTA may be higher (0.87%)[17] than is reported for other intraocular procedures.[21-26] This issue becomes more important in the context of the need for repetitive injections required to treat chronic retinal conditions. This study reports the incidence rates of culture-negative and culture-positive endophthalmitis for patients receiving IVTA at 2 centers.

Author Affiliations: Department of Ophthalmology, Baylor College of Medicine, Houston, Tex (Drs Westfall, Osborn, Benz, Mieler, and Holz); and Austin Retina Associates, College Station, Tex (Dr Kuhl). Dr Mieler is now with the Department of Ophthalmology, University of Chicago, Chicago, Ill.
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METHODS

The Baylor College of Medicine institutional review board approved the study protocol. This is a retrospective, interventional, consecutive case series including all eyes (n=1006) receiving IVTA injection between January 1, 2000, and January 30, 2004, at 2 centers (Baylor College of Medicine, Houston, Tex, and Austin Retina Associates, College Station, Tex). The indications for injection included diabetic macular edema, pseudophakic macular edema, edema due to retinal vein occlusion, uveitic macular edema, and exudative age-related maculopathy. Eyes undergoing combination treatment with photodynamic therapy were included in the study. Eyes were excluded if another intraocular procedure was performed during the 6-week study period. In particular, eyes undergoing vitrectomy with IVTA were excluded.

The IVTA procedure was similar for all of the patients. All of the patients underwent an informed consent discussion and then signed an operative permit. Topical 0.5% proparacaine hydrochloride drops (Alcain; Alcon Laboratories, Fort Worth, Tex) were placed on the ocular surface. Either a 4% lidocaine hydrochloride–soaked cotton pledget was placed on the temporal bulbar conjunctiva and held in place for approximately 1 minute or a subconjunctival injection of approximately 0.1 mL of 2% lidocaine over the temporal pars plana via a 30-gauge needle on a 1-mL syringe was used for anesthesia. Some investigators used both the pledget and subconjunctival injection. The eye was disinfected by instilling several drops of 5% povidone-iodine solution onto the ocular surface and then cleansing the lid margins, lashes, and periocular skin with 10% povidone-iodine solution–soaked cotton tip applicators. Approximately 5 minutes were allowed

to elapse after preparation prior to injection. Triamcinolone acetonide (Kenalog; Bristol Myers Squibb Co, Princeton, NJ) in single-use, 40-mg/mL, 1-mL bottles was used exclusively. The top of the container was cleansed with an alcohol wipe and approximately 0.5 mL of the drug vehicle mixture was drawn into a 1-mL syringe. The syringe was allowed to sit in an upright position and the excess corticosteroid was expressed, leaving approximately 0.1 mL of the drug within the syringe. Injections were performed using either a 30-gauge needle or a 27-gauge needle. However, owing to clogging in the 30-gauge needle, the vast majority of these injections were given with the larger-bored 27-gauge needle. A wire eyelid speculum was then placed into the eye. Plastic drapes were not used. Either 3.5 mm (in pseudophakic patients) or 4 mm (in phakic patients) was measured from the limbus with a caliper in the inferotemporal quadrant. The 27-gauge needle was then introduced into the anterior vitreous cavity with the needle tip aimed at the inferior retina. The drug was injected with a slow, continuous push. As the needle was removed from the eye, a sterile cotton tip applicator was applied over the injection site to limit egress of drug or vitreous. The eye was inspected with indirect ophthalmoscopy to ensure adequate perfusion of the retinal arteries and veins at the optic nerve head and to assess drug location. The intraocular pressure was checked immediately following the injection and, in most cases, was found to be quite elevated initially with intraocular pressure readings of 40 to 60 mm Hg by applanation tonometry. In most cases, the patient was monitored using serial intraocular pressure measurements, and over the ensuing half hour following injection, the intraocular pressure normalized. In rare cases where the intraocular pressure failed to decrease substantially, an anterior chamber paracentesis was performed using a 30-gauge needle on a 1-mL syringe with the plunger removed. Following the injection, the patient was educated about the symptoms of endophthalmitis and instructed to report immediately should symptoms arise. Postoperative examinations were scheduled between 2 and 7 days, 4 weeks, and 6 weeks.

The primary outcome was the occurrence of endophthalmitis within the observation period of 6 weeks, which was thus considered acute.

RESULTS

In total, 1006 IVTA injections were performed at the 2 centers during this time period. One patient was identified with signs and symptoms of endophthalmitis. The time to presentation was 4 days. The clinical findings were conjunctival erythema, mild anterior chamber cellular reaction, trace flare, mild vitritis with several strands of fibrin, and decreased vision. Pain, keratoprecipitates, anterior chamber fibrin, and hypopyon were absent. Owing to the mild findings we found at examination, the patient was placed on oral gatifloxacin (Tequin; Bristol Myers Squibb Co) at a dose of 400 mg once per day and topical gatifloxacin (Zymar; Allergan Inc, Irvine, Calif) at a dose of 1 drop 4 times per day.

By the following day, the vitreous fibrin and number of cells increased, so the patient was taken to the operating room for vitreous biopsy and intravitreal antibiotics (vancomycin hydrochloride, 1 mg/0.1 mL, and ceftazidime, 2.25 mg/0.1 mL). Postoperatively, the patient continued to receive topical gatifloxacin (1 drop 4 times/d) and oral gatifloxacin (400 mg/d) for 10 days. Gram stain, acid-fast stain, acridine orange, calcofluor white, and silver stain were negative for organisms. The fungal, aerobic, and anaerobic cultures were all negative for growth. After 6 weeks, the patient's visual acuity was 20/40, an improvement over his preinjection visual acuity of 20/100.

In the 6 weeks following IVTA, there was an incidence of 1 case of acute, culture-negative endophthalmitis per 1006 eyes, or 0.10%.

COMMENT

In our study, the incidence of culture-positive endophthalmitis was 0.00% for patients in the 6 weeks following IVTA injection. It is possible that the single patient in our study who had culture-negative endophthalmitis (for an incidence of 0.10%) had no laboratory growth because of an aggressive antibiotic regimen prior to the culture. This rate is considerably lower than the rate of 0.87% of culture-positive cases reported by Moshfeghi et al.[17] Our rate is also lower than those reported following intravitreal ganciclovir injection for cytomegalovirus retinitis (0.29% in 1372 injections,[21] 0.14% in 2890 injections,[22] and 0.64% in 156 injections[23]).[24] The low incidence of endophthalmitis in our study may be owing to our sterile approach that was prompted by previous reports associating corticosteroid injections with endophthalmitis.[17] We feel that preparation with povidone-iodine, use of an eyelid speculum, and single-use medication containers were significant.[27-29] Many studies have shown that 5% povidone-iodine is a safe and effective agent in reducing endophthalmitis at the time of surgery.[27,30-37] Thorough preparation with povidone-iodine on the ocular surface and eyelids is the only agent that has been shown to reduce the risk of endophthalmitis in a prospective study.[31] Given that the source of causative bacteria is often the patient's own ocular surface or adnexa, it is reasonable to try to reduce the exposure to the injection site and injection needle.[38,39] Thus, retracting the eyelids with an eyelid speculum seems reasonable. In addition, none of the patients received an injection from a multiple-use vial of triamcinolone since a previous study[38] showed that multiple-use medication bottles were more likely to be colonized by bacteria.[40,41]

The incidence of endophthalmitis following IVTA injection in our study reflects the heightened interest in minimizing risks associated with this increasingly common procedure. The significance lies in counseling the patient accurately on the risk-benefit ratio for IVTA. In addition, treatment of chronic conditions with IVTA needs to be repeated frequently after 3 to 4 months. While the previously reported risk of 0.87% may seem unacceptably high in this context, we feel that the incidence in our study of 1 case of acute postoperative endophthalmitis in 1006 eyes significantly alters the risk-benefit ratio for IVTA.

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Correspondence: Eric R. Holz, MD, Cullen Eye Institute, Baylor College of Medicine, 6565 Fannin St, NC-205, Houston, TX 77030 (eholz@bcm.tmc.edu).
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