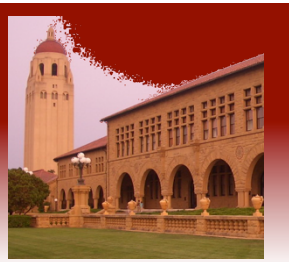
Effect of Lidocaine Gel on Endophthalmitis Rates following Intravitreal Injections

Theodore Leng, MD, MS, Yannis M. Paulus, MD and Eleonora M. Lad, MD, PhD
Department of Ophthalmology, Stanford University School of Medicine



Abstract

Purpose: To determine if the use of lidocaine gel before application of povidone iodine affects endophthalmitis rates following intravitreal injections.

Methods: Retrospective consecutive case series of all intravitreal injections (IVIs) at a single academic institution (Stanford University Medical Center) from 1/1/2000 to 12/31/2009. IVIs performed for endophthalmitis treatment were excluded. This was a retrospective review of medical records (charts and electronic records).

Results: When no lidocaine gel was used, four cases of endophthalmitis following 4120 (0.097%) IVIs were recorded. When 2% lidocaine gel was applied before antiseptic, four cases of endophthalmitis following 4682 (0.085%) IVIs were observed (p=0.8558).

Conclusion: The use of lidocaine gel prior to povidine iodine does not significantly alter post-injection endophthalmitis rates.

Introduction

- The use of lidocaine ophthalmic gel prior to intravitreal injections (IVIs) is popular due to its safety and anesthetic efficacy as well as high patient and surgeon satisfaction.
- There is emerging concern regarding potential increase in risk of endophthalmitis following use of lidocaine gel prior to IVIs. In an *in vitro* microbiology laboratory-controlled study, Boden *et al*. found that the use of lidocaine gel prior to the application of povidone–iodine (PI) resulted in formation of a barrier to PI, thus decreasing its antiseptic effect and increasing microbial survival.[1]
- A large retrospective, observational case series by Miller and colleagues suggested an increased risk of acute postoperative endophthalmitis after cataract surgery associated with lidocaine gel anesthesia, but it was difficult to draw any statistically significant conclusions about the role of the anesthetic.[2]
- The goal of our study was to determine the incidence of post-IVI endophthalmitis in patients who received lidocaine gel anesthesia prior to the application of PI when compared to post-IVI endophthalmitis cases that did not receive viscous anesthetics at a single academic institution and to report on the clinical course and outcomes of those cases.

Results

	No Gel Group	Gel Group
Number of injections	4120 (889 TA, 351 pegaptanib, 1629 ranibizumab, 1251 bevacizumab)	4682 (218 TA, 3027 ranizumab, 1437 bevacizumab)
Endophthalmitis rate	4 (0.097%). 3- TA, 1- ranibizumab	4 (0.085%)- all bevacizumab
Immunosupression	1 pt with DM2/MM	2 pts with pre-DM2
Va prior to IVI	20/60-20/400	20/60-CF
Indication	Wet AMD (3/4), CRVO (1/4)	Wet AMD (4/4)
Phakic status	All pseudphakic	1 phakic, rest pseudophakic (3)
Days to dx	2	1-13
Va at diagnosis	CF-HM	20/100-CF
Positive cultures	1/4 (Staph. Epidermidis)	0
Treatment	Vitreous tap, IVI (vanc/ceftaz), topical fluoroquinolone	Vitreous tap, IVI (vanc/ceftaz), topical fluoroquinolone 2/4 IVI dexamethasone
Surgery	1/4 PPV (day 3)	0
Va one month	20/80-CF	20/60-CF
Va 3 months	20/50-20/400	20/50-CF
Pts with improvement in Va	4/4 improvement	2/4 improvement, 2/4 no change

Materials & Methods

- Retrospective, observational case series at the California Vitreoretinal Center of the Stanford University School of Medicine.
- All patients that were diagnosed with endophthalmitis after IVI of a medication from January 1, 2000 to December 31, 2009 were identified (ICD9 codes of 360.00 and 360.01). The medical billing and coding database was searched to determine the total number of patients who were treated with IVIs (CPT code 67028) during the same time period. A search was performed using the associated HCPCS J code for the medication used (bevacizumb J9035, ranibizumab J2778, triamcinolone J3300 or J3301).
- Patients who received IVIs for treatment of endophthalmitis were excluded from the current study. The study period consisted of two distinct epochs. 1. From January 1, 2000 to October 31, 2007 lidocaine gel was not employed prior to administration of IVIs. All eyes for injection were prepped with 5% povidone iodine, followed by application of a cotton tip soaked in 0.5% proparacaine. 2. During November 1, 2007 to December 31, 2009 all eyes that received IVIs were prepped with 2% lidocaine gel first, followed by a swab of 10% povidone iodine prior to injection.
- The incidence of endophthalmitis between the two groups (no-gel period and lidocaine gel period) were compared using a Chi-square test. The level of statistical significance was set at $p < 0.05$.
- The medical records of all patients with post-IVI endophthalmitis were reviewed and data concerning the clinical characteristics, treatment course, and outcomes were collected.

- The prevalence of endophthalmitis following IVIs, albeit difficult to estimate due to scarcity of large studies, ranged from 0.14% to 0.87% per injection between various reports.[3] In our study, the incidence of injection-related endophthalmitis was in agreement and less than 0.1% in both groups (0.097% in the no lidocaine gel group and 0.085% in the lidocaine gel group, p=0.8558).
- Due to the small number of endophthalmitis cases in each group (four in the no gel and four patients in the lidocaine gel group), no conclusions can be drawn regarding the visual outcomes after the treatment of endophthalmitis.
- Additionally, no conclusions can be drawn regarding the medication administered prior to the diagnosis of endophthalmitis.
- **Treatment:** All our patients received intravitreal antibiotics (vancomycin/ceftazidime) and topical fluoroquinolones.
- The pathogenic organisms most commonly isolated from intravitreal cultures of patients with IVI-related endophthalmitis are *Staphylococcus epidermidis* and coagulase-negative Staphylococci.[4-6] In agreement with these studies, the only positive cultures in our case series were found to grow *S. epidermidis*.

Conclusions

- In our study, the incidence of injection-related endophthalmitis was in agreement with previous studies and less than 0.1% in both groups (0.097% in the no lidocaine gel group and 0.085% in the lidocaine gel group, p=0.8558).
- While previous *in vitro* studies have suggested that lidocaine gel has the potential to form a barrier and prevent povidone from performing its antiseptic action on the ocular surface prior to intraocular procedures, this study did not find a clinically significant impact on endophthalmitis rates following IVIs after the use of lidocaine gel anesthesia.
- Given the lack of significant increase in endopthalmitis risk, as well as high surgeon and patient satisfaction, the use of lidocaine gel for pre-IVI topical anesthesia can provide for a safe and effective form of analgesia in the clinical setting.

References

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