Intravitreal Triple Therapy with Vancomycin, Ceftazidime, and Moxifloxacin for Bacterial Endophthalmitis

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Purpose:
Recent studies have reported increasing rates of antibiotic resistance in endophthalmitis. Several studies have explored the therapeutic potential of intravitreal moxifloxacin in animal models and case reports. This study examines outcomes of triple therapy with intravitreal vancomycin, ceftazidime, and moxifloxacin for endophthalmitis. Moxifloxacin offers broad-spectrum antimicrobial coverage, synergy due to its unique mechanism of action, and co-administration with ceftazidime double-covers Gram-negative organisms.

Methods:
This is a single-center review of all patients treated with above mentioned intravitreal antibiotics from January 2009 to August 2019. Cases of confirmed or suspected fungal endophthalmitis were excluded as were cases with less than 3 months of follow-up. In cases of bilateral endophthalmitis, one eye was chosen at random analysis. Patients could receive topical or systemic antibiotics and steroids at the discretion of the treating physician. Primary outcomes were percentages of eyes attaining greater than or equal to 20/200 and 20/50 Snellen visual acuity at final follow-up.

Results:
94 eyes met inclusion criteria. 85 of 94 (90%) of eyes were treated with initial tap and inject. 51 of 94 eyes (54%) achieved a visual acuity of 20/200 during follow-up, with 29 (31%) returning to at least 20/50. In subgroup analysis, visual acuity survival curves were superior for patients with post-cataract endophthalmitis compared to post-injection and bleb-associated endophthalmitis cohorts for both 20/200 (Figure 1) and 20/50 (Figure 2) acuity thresholds (p<0.005). 17 of 18 (94%) eyes with post-cataract endophthalmitis obtained ≥ 20/200 acuity and 14 of 18 (77%) obtained ≥ 20/50 acuity. Of note there were no cases of macular infarction.

Conclusions:
Intravitreal moxifloxacin (160µg/0.1mL) was well tolerated as an adjunct to vancomycin and ceftazidime for bacterial endophthalmitis. In an era of increasing antimicrobial resistance, particularly outside the United States, use of this novel combination offers numerous advantages including increased Gram-negative coverage and synergy. Results compare favorably to historically reported outcomes, particularly for post-cataract and post-injection cases. Further study is merited to compare the efficacy of triple therapy with moxifloxacin to traditional therapy.