Endophthalmitis: Antibacterial Activity of Precipitates of Vancomycin and Ceftazidime

We appreciate the comments by Hui et al. (3) concerning our article (1). We agree about the potential benefits of repeated intravitreal injections of antibiotics. Intravitreal antibiotics have become part of the standard treatment for endophthalmitis. The current antibiotic treatment for acute-onset bacterial endophthalmitis includes vancomycin for gram-positive coverage and either ceftazidime or an aminoglycoside for gram-negative coverage (7). However, neither ceftazidime nor an aminoglycoside can cover all the gram-negative organisms, such as many nonfermenters. Based on one in vitro study, ceftazidime precipitates in vitreous at body temperature, regardless of the presence of vancomycin (5). Because the extent of ceftazidime precipitates is less, normal saline is preferred to a balanced salt solution as a preparation medium for antibiotics for intravitreal injection (5). In infected eyes with endophthalmitis, there are several parameters, such as electrolyte concentrations, pH, inflammatory cells, and total protein contents; therefore, precipitation may not disrupt the therapeutic effects of antibiotics in bacterial endophthalmitis. Recently, there was a report that showed that the precipitate and supernatant retain significant antibacterial activity, thus confirming the efficacy of combination therapy with vancomycin and ceftazidime in the management of bacterial endophthalmitis (6). This validates that vancomycin and ceftazidime are still an excellent combination of antibiotics for the empirical treatment of bacterial endophthalmitis.

In the Endophthalmitis Vitrectomy Study, there was no difference between final visual acuities with and without the use of systemic antibiotics (2). Compared with the result for exogenous postoperative endophthalmitis, the systemic antibiotics decrease the bacteria loading to the eye in endogenous endophthalmitis. However, they cannot prevent the occurrence of endophthalmitis, as in our case, Vitrectomy and lens extraction significantly shorten the half-life of ceftazidime after intravitreal injection (8). Inflammation increases clearance to a small degree in phakic and aphakic eyes (8). Repeated intravitreal injections of ceftazidime may have the potential benefit of maintaining the therapeutic level against bacterial organisms. However, infectious endophthalmitis is a sight-threatening ocular disease, especially in endogenous bacterial endophthalmitis. It causes a high possibility of loss of vision and has a significant impact on socioeconomic life. Even though intravitreal antibiotics successfully destroy the bacteria, the retina may continue to be damaged by the remaining inflammatory debris, and functional recovery is limited by potential pathologies, such as macular edema, retinal detachment, and retinal vasculitis. After 12 to 24 h of initial intravitreal antibiotics, we recommend early pars plana vitrectomy with repeated intravitreal antibiotics if there is no improvement in clinical signs and symptoms, because early vitrectomy for endophthalmitis dramatically reduces the inflammatory debris load in the vitreous cavity, provides a large specimen for diagnostic evaluation, and achieves a higher possibility of favorable visual outcome (4).

REFERENCES

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