

Comparative Analysis of Bacterial vs Culture-Negative Endophthalmitis

Shayaan Kaleem¹, Abbie, Lai², BSc, Amir-Ali Golrokhian-Sani³, BSc, Marko, Popovic⁴, MD, Rajeev, Muni⁴, MD,

¹Faculty of Medicine, University of Toronto

²Faculty of Medicine, McMaster University

³Faculty of Medicine, University of Ottawa

⁴Department of Ophthalmology and Vision Sciences, University of Toronto

Introduction: Endophthalmitis can be caused by numerous infectious etiologies, but differences in visual acuity outcomes between etiological agents have not been extensively compared. This retrospective study aimed to assess visual acuity outcomes in patients with endophthalmitis based on microbiology results.

Methods: The data were collected from the electronic medical records of a vitreoretinal surgeon in Toronto from March 2011 to March 2023. After excluding patients with no follow up, the data from adult individuals with infectious endophthalmitis were extracted. Patients were categorized based on their microbiology report as having either bacterial or culture-negative microbiology. Univariable and multivariable linear and logistic regression were conducted to assess the differences in visual acuity outcomes after treatment for endophthalmitis based on microbiology, adjusting for age and sex. Statistical analyses were carried out in Microsoft Excel.

Results: Overall, 47 patients with infectious endophthalmitis were included. There was a more negative coefficient in the linear association between mean visual acuity and bacterial cultures (R-squared = 0.606, $p = 0.008$) compared to the association between mean visual acuity and culture-negative samples (R-squared = 0.645, $p = 0.003$). This suggests that mean VA improved more quickly in the bacterial group than the culture-negative group. However, on multivariable logistic regression, there was no significant difference in visual improvement between samples with bacterial culture or culture-negative from baseline to 1 month post-treatment ($p = 0.11$) and baseline to 12 months post-treatment ($p = 0.57$).

Conclusions: This linear and multivariable analysis found no significant difference in VA recovery between endophthalmitis patients with bacterial or culture-negative infections. Further large clinical trials would be helpful in further exploring the association between culture results with different microorganisms and their functional outcomes.