



## Response to Kato et al.: Prevalence of, and risk factors for, hematogenous fungal endophthalmitis in patients with *Candida* bloodstream infection

H. Russell Day Jr.<sup>1</sup> · Mark P. Breazzano<sup>1,3</sup> · Karen C. Bloch<sup>1,4</sup> · Edward F. Cherney<sup>1,2</sup> · Sean P. Donahue<sup>1,2,5</sup> · John B. Bond III<sup>1,2,6</sup>

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Dear Editor,

In June 2018, Kato et al. presented the prevalence and risk factors of patients who developed possible fungal eye disease in the setting of bloodstream *Candida* infections [1]. The authors recommended that patients with candidemia and central venous catheter (CVC) placement should be closely monitored by ophthalmologists. We believe that the findings in this study do not support this recommendation.

Although the authors initially distinguish between patients having findings of chorioretinitis and those with vitritis, they combine the prevalence of these two conditions labeling both “endogenous fungal endophthalmitis.” This terminology is incorrect as nonspecific chorioretinitis without vitreous involvement is inconsistent with established criteria for endophthalmitis [2]. Classifying all *Candida*-related ocular findings as “endogenous fungal endophthalmitis” inflates the prevalence of actual endophthalmitis and does not reflect that management and outcomes differ

substantially between these distinct ocular conditions. Selection bias, including incorrect and inconsistent definitions of endophthalmitis, largely accounts for the wide range of prevalence of endophthalmitis reported among other studies [2].

Kato et al. do not provide data among their studied patients showing whether ophthalmic examination in patients with candidemia and CVC placement leads to improved outcomes. They provide no data showing how often ocular findings led to invasive treatment including vitreous injection of antifungal agents and surgical vitrectomy or how many patients were maintained on medical treatment alone. They do not provide visual outcomes data comparing invasive ocular treatment and medical treatment alone. They do not discuss poor visual outcomes or complications associated with invasive treatments. They provide no data showing that invasive ocular treatment contributes to elimination of candidemia or prevents subsequent reinfection.

The goal of ophthalmologic monitoring of patients with candidemia is to identify harmful findings that lead to effective changes in management. It is important to emphasize this perspective as Infectious Diseases Society of America recommendations for universal screening of patients with candidemia have been called into question by recent studies within the ophthalmologic literature [2, 3]. Most ocular findings in the context of *Candida* infection are nonspecific, and if patients survive, will respond to prompt systemic treatment and removal of sources of infection such as central venous catheters [2, 3]. The benefit of invasive treatments including injection of antifungal medication into the vitreous, with or without surgical vitrectomy, is unclear as invasive treatments can be associated with poor outcomes or surgical complications [4]. Given that the Infectious Diseases Society of America acknowledges that their recommendations are based on low quality evidence [5], future studies should provide outcomes data demonstrating the benefit of

✉ John B. Bond III  
john.bond@vanderbilt.edu

<sup>1</sup> Vanderbilt University School of Medicine, Nashville, TN, USA

<sup>2</sup> Department of Ophthalmology and Visual Sciences, Vanderbilt University Medical Center, 2311 Pierce Ave, Nashville, TN 37232, USA

<sup>3</sup> Department of Ophthalmology, Harkness Eye Institute, Columbia University College of Physicians and Surgeons, New York, NY, USA

<sup>4</sup> Department of Internal Medicine, Vanderbilt University Medical Center, Nashville, TN, USA

<sup>5</sup> Department of Pediatrics, Vanderbilt University Medical Center, Nashville, TN, USA

<sup>6</sup> Veterans Affairs Tennessee Valley Healthcare System Center, Nashville, TN, USA

ophthalmologic monitoring before making any additional recommendations.

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### Compliance with ethical standards

The manuscript does not contain clinical studies or patient data.

**Conflict of interest** The authors declare that they have no conflict of interest.

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