

## Ocular Imaging in Patients with COVID-19

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Dear Editor,

We read the article by Lecler et al with interest.<sup>1</sup> We understand the retrospective nature of this article and understand the limitations. An ophthalmologist on board for this study would have helped discern out the findings especially those of patients having nodules in the macular region and those outside macular region. 67% of these patients were diabetic and 89% were admitted to the ICU. These two conditions post corona virus disease can predispose to endogenous endophthalmitis as seen in our clinical practice.

It is important to rule out endogenous endophthalmitis in these patients who were vulnerable. The nodules could also represent sub-retinal abscesses. Often irregular thickening or enhancement of the uveo-scleral layer may be the only finding on contrast enhanced MRI especially early in the disease. It is helpful to compare and contrast with the other eye especially if it is unilateral or asymmetric. Did the patients who had fundus examination have nodules at posterior pole?

The authors also should describe vitreous findings of MRI in greater detail. This is very important as mild increased vitreous signal intensity on fluid-attenuated inversion recovery (FLAIR) and T1W magnetic resonance imaging (MRI), may be an early sign of endophthalmitis and is thought to be due to proteinaceous exudates into the vitreous.<sup>2</sup>

Rumboldt et al<sup>3</sup> have described a case of endogenous bacterial endophthalmitis who underwent MRI of the orbits before and during the course of treatment. Intraocular hyperintensity on FLAIR and diffusion-weighted images (DWI) were found very useful for diagnosing endophthalmitis. After a few days of treatment, a marked relative increase in intraocular mean apparent diffusion coefficient values (ADC) was observed, which appears to indicate good treatment response. They describe that increased signal intensity within the peripheral aspects of the affected globe on FLAIR and DWI with mean ADC values decreased down to 20% compared with the values in the contralateral globe.

These findings were interpreted as representing endophthalmitis.

It will also be interesting to know if these patients had a further ophthalmic evaluation to correlate with the clinical findings and could be part of a future study.

## References

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## **Endophthalmitis in Patients with COVID-19**

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We would like to thank the authors of the letter for their valuable remarks.

In our series, more than half of the patients described were diabetic. All but one patient was admitted to the ICU. These features are known risk factors for developing endogenous endophthalmitis(1). None of the patients who underwent fundus examinations had nodules of the posterior pole of the globe, which prevented us from finding identifying clinical-radiological correlations. One patient with a corneal ulcer had simultaneous mild thickening of the uveo-scleral layer without any signs for endophthalmitis(2).

At MRI, we did not observe any abnormalities related to endophthalmitis. There were no vitreous signal abnormalities on pre- or post-contrast T1- or FLAIR-weighted imaging or on diffusion-weighted imaging. There were neither exudates nor exudative retinal/choroidal detachment visible. Neither intraocular abscess nor peribulbar inflammation was seen. However, MRI sequences are not very sensitive to detect endophthalmitis, especially at an early stage. Thus it is difficult to exclude endophthalmitis based solely on MRI findings, especially since the MRI sequences performed were not dedicated for eye imaging(1,3,4).

We agree that further studies including specific ophthalmic evaluation including funduscopy, OCT, retinal angiogram as well as dedicated high-resolution eye imaging may be valuable to further understand ocular abnormalities related to COVID-19.

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