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### MEETING ABSTRACT

#### A1.7

##### Effect of a previous COVID-19 infection on the retinal vasculature

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**Background:** Since March 2020, the COVID-19 pandemic has affected countries around the world and continues to challenge humanity. The most common symptoms during infection are respiratory phenomena. However, there is also increasing evidence of neurological and vascular symptoms as the disease is associated with CNS manifestations and endothelial dysfunction. Whether residuals remain after patients have recovered from COVID-19 infection is still the subject of current research. We set out to investigate whether ocular vascular alterations remain after recovery from COVID-19 infection.

**Methods:** In the present study, we included patients previously infected with COVID-19 and healthy age- and sex-matched controls. Patients needed a confirmed positive PCR test for SARS-CoV-2 infection in the medical history within the last 6 months and positive testing for SARS-CoV-2 seroprevalence for inclusion. Negative testing for SARS-CoV-2 seroprevalence and no history of COVID-19 infection were inclusion criteria for controls. A dynamic vessel analyzer (DVA, Imedos, Germany) was used to measure arteriovenous (AV) difference in oxygen saturation, retinal vessel diameters, and arteriovenous ratio (AVR). AV was calculated out of retinal arterial and venous oxygen saturation. We used laser speckle flowgraphy (LSFG, Nidek, Japan) to additionally quantify the mean blur rate in the tissue area of the optic nerve head (MT).

**Results:** Twenty-nine patients who had recovered from moderate-to-severe COVID-19 infection requiring hospitalization (mean age 35 ± 17 years) and 11 control subjects (mean age 36 ± 12 years) met our inclusion criteria. We found no differences between the two groups in terms of sex or concomitant diseases in the medical history. Patients had a significantly higher body mass index (BMI) than healthy controls (27.5 ± 5.6 vs. 24.5 ± 2.8 m<sup>2</sup>/kg, *p* = 0.036). Compared to control subjects both AVR and AV difference in oxygen saturation were significantly lower in patients (*p* = 0.021 for AVR and *p* = 0.023 for AV difference in oxygen saturation). It was also shown that MT in the optic nerve head was significantly lower in patients (23.4 ± 10.1 a.u.) than in healthy controls (47.3 ± 26.6 a.u., *p* < 0.001).

**Discussion:** This study shows changes in retinal vessels as well as in optic nerve head blood flow in patients who have recovered from COVID-19 infection. Further, longitudinal studies are required to investigate whether these changes in retinal metabolism are temporary or permanent.

**Keywords:** COVID-19 – ocular blood flow – retinal oxygen saturation

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