



Retinal Involvement and Ocular Findings in COVID-19 Pneumonia Patients

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ABOUT THE STUDY

Italy was the first European country to be hit by the SARS-CoV-2 epidemic, which began in the Wuhan region of China and has so far resulted in 241,611 cases and 34,861 deaths. Because this is a life-threatening condition, much study has concentrated on improving the respiratory system's survival rate, leaving the impact on other systems or districts unclear or unknown. Only a few data points on COVID-19 ocular involvement are currently available. SARS-CoVs, which belong to the Betacoronavirus genus, belong to the *Orthocoronavirinae* subfamily, which has previously been shown to harm ocular tissues. In animal models of murine and feline species, certain symptoms such as uveitis, retinitis, and optic neuritis have been identified; however, these findings have never been confirmed in people.

The SARS-CoV-2 epidemic in recent years has reignited interest in ocular manifestations, especially since concomitant conjunctivitis and ocular surface colonisation have been recorded. In the 2000s, the same unanswered questions arose, implying the need for immediate precautionary measures to protect ophthalmologists and their patients. Nonetheless, while recent evidence suggests that COVID-19 infection is linked to changes in the immune and coagulation systems, as well as possible viral spread across the blood-brain barrier and clinical and anatomopathological findings of Disseminated Intravascular Coagulopathy (DIC), the effects of these changes on the eye, particularly in terms of posterior segment involvement, have yet to be fully understood.

Previous investigations in animals infected with viruses belonging to the broad subfamily of *Orthocoronavirinae* provided the basis for focusing on potential ocular fundus abnormalities.

In feline and mouse models, the start of uveitis or retinitis has been documented and connected to an underlying inflammatory mechanism that causes vasculitis or viral-mediated inflammation. Endothelial damage has been identified as one of the most common causes of COVID-19's systemic vascular thromboembolic and/or inflammatory symptoms in recent clinical and anatomopathological findings. Although there have been two confirmed cases of SARS-CoV-2 positive CSF tests and one post-mortem, there is no conclusive evidence that the virus can directly impact the central nervous system.

Only one study describes retinal abnormalities in a small group of SARS-CoV-2-positive individuals who are asymptomatic. In 4 of the 12 patients, the authors discovered cotton-wool-like lesions and microhaemorrhages, as well as inner retinal OCT hyperreflective areas in the entire sample. However, aside from "normal blood values," the authors did not disclose any precise information that would allow their patients to be clinically characterised. Indeed, there was little information provided about the presence of systemic comorbidities or the patients' current treatment. As a result, it's impossible to rule out the possibility that their findings are due to pre-existing non-COVID-19-related systemic disorders of the retina, such as hypertensive or diabetic retinopathy, or other infectious diseases.

Conjunctivitis in hospitalised patients, on the other hand, could be an epiphenomenon. Because COVID-19 clearly impacts the peripheral nerve system, as seen by the reported 85-88 percent rate of olfactory and gustatory dysfunction, we looked into the possibility of trigeminal sensory pathways being involved by looking at corneal sensitivity. Aesthesiometry studies, on the other hand, appear to show that, unlike herpes viruses, SARS-CoV-2 has no effect on corneal sensitivity.

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