

Retinal manifestations in patients with COVID-19: A prospective cohort study

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Introduction

- The recent outbreak of the Coronavirus SARS-CoV-2 has been declared a worldwide pandemic.
- Within various multi-organ involvement, alterations of the **retina** in patients with SARS-CoV-2 have been described.
- The most frequent are **cotton wool spots (CWS)** reported in several cross-sectional studies. Other manifestations include **retinal hemorrhages, dilated veins and tortuous vessels**.
- The pathophysiology, incidence and clinical course of these retinal findings remain yet **unclear**.

Purpose

The purpose of this study was to perform a systematic screening for **retinal alterations** among consecutive **patients hospitalized** for an acute COVID-19 infection requiring supplemental oxygen, to identify clinical features associated with the presence of retinal abnormalities and to study the longitudinal evolution of the identified lesions.

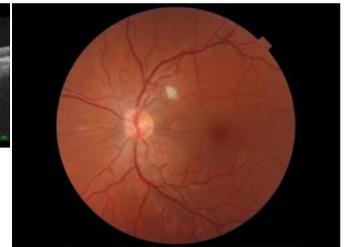
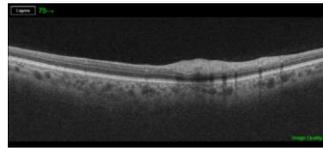
Methods

- We performed a **prospective, observational** study on **172** consecutively **hospitalized** patients with acute confirmed COVID-19 infection.
- All patients underwent screening **fundus wide field photography** at the time of hospital admission.
- **Vital parameters** and **biological variables** were collected on the day of admission. Concomitant **diseases** were listed.
- **Three-month** ophthalmic follow-up was scheduled for patients with retinal lesions.

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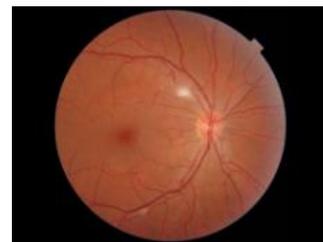
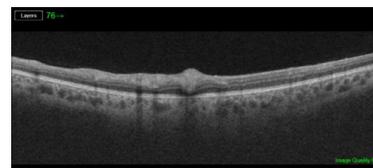
Results

- Of the 172 examined patients, retinal lesions were found in **19 patients (11%)**.
- **Cotton wool spots** alone (CWS) were found in 10 patients (6%), **hemorrhages** alone were found in 3 patients (2%) and **CWS with hemorrhages** were found in 6 patients (3.5%).
- Among these 19 patients, six had **bilateral presentation** (3.5%).
- OCT scans showed hyperreflectivity of the inner retinal layers, consistent with CWS (Figure 1,2)



- **Three months after** screening, there was a complete resolution of clinically evident CWS (Figure 3) with concomitant normalization of OCT scan (Figure 4) in all patients. All patients were symptom-free 3 months after screening.

- **Diabetes history** and **obesity** were significantly more prevalent among patients with retinal abnormalities.
- Patients with retinal findings presented **higher C-reactive protein (CRP)** values and **potassium** levels.



Conclusion

Considering that retinal vasculature can be **directly** evaluated via fundus examination, visualization of such lesions could represent signs of vascular involvement in **other organs besides the eye**. Thus, the above mentioned comorbidities could be a **severe risk factor** not only for the retinal vasculature but also for **brain and other organs' vasculature**.