

Ocular Complications of COVID-19 Patients Admitted to Intensive Care in Portugal

Complicações Oculares em Doentes COVID-19 Internados em Cuidados Intensivos em Portugal

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Palavras-chave: COVID-19/tratamento; Cuidados Críticos; Doenças dos Olhos/etiologia; Doenças dos Olhos/prevenção e controlo; Portugal; Posicionamento dos Doentes/efeitos adversos; SARS-CoV-2; Unidades de Cuidados Intensivos

Since we are now experiencing the aftermath of the COVID-19 pandemic, it is time to gather evidence and learn new lessons to improve future clinical care. Admission to Intensive Care Units (ICU) surged significantly throughout the world, particularly during the first year of the pandemic.¹ Nevertheless, as a result of advanced medical care, countless lives have been saved. The complications that arose in these challenging scenarios, on the other hand, may have impacted the patient's quality of life. In particular, mechanical ventilation, prone positioning, sedation, and neuromuscular blockade may have raised the risk of ocular complications.^{2,3}

In this regard, we examined the medical records of all COVID-19 patients admitted to the ICU of Centro Hospitalar Universitário de São João in Porto, Portugal, between January 2020 and December 2021 (Fig. 1). The study was approved by the hospital's Ethics Committee, and due to its retrospective and anonymized nature, it was not considered necessary to ask for informed consent.

Ocular complications occurred in 24 (9.5%) of 253 COVID-19 patients. There were six cases of exposure keratopathy, five cases of conjunctivitis, and nine cases of conjunctival hemorrhage. Individual cases of eyelid ulcer, rhino-orbital mucormycosis, necrotizing scleritis, and globe rupture accounted for the remaining four cases.

While most cases did not result in long-term sequelae, two examples are noted below for their significant long-term sequelae.

The first case involved an elderly man with a history of non-insulin-dependent type 2 diabetes who was hospitalized in the ICU for 81 days, requiring mechanical ventilation and systemic steroid therapy. One week after being discharged, the patient presented to the emergency department with acute proptosis, decreased visual acuity in the

right eye, and diplopia. Following orbital computed tomography (CT) and magnetic resonance imaging (MRI) imaging, a diagnosis of rhino-orbital mucormycosis was made. In order to successfully control the infectious process, intravenous lysosomal amphotericin B was started, followed by an endoscopic bilateral ethmoidectomy, maxillary antrostomy, and sphenoidotomy and a right orbital exenteration (surgical removal of the eyeball and the surrounding tissues: the eyelids and the muscles, nerves and fatty tissue adjacent to the eye). Mucormycosis has been reported to occur in association with COVID-19 infection.

Similarly to our case report, a previous review identified 99 cases of mucormycosis until May 2021 where most patients were male, had a history of diabetes mellitus, and had received corticosteroids for the management of COVID-19.⁴ It is important to understand that the triad of SARS-CoV-2, corticosteroid use, and uncontrolled diabetes mellitus have been pivotal in the increasing incidence of this fungal infection.

Another particular case is of an elderly woman requiring mechanical ventilation in prone position. The past medical history included non-insulin-dependent type 2 diabetes, systemic hypertension, dyslipidemia, obesity, and large-incision bilateral cataract extraction. Four days after admission, an ophthalmological evaluation was requested because of a thick subconjunctival hemorrhage, which revealed a right globe rupture with an exteriorized lens haptic. Intraocular lenses (IOLs) are used in ophthalmic surgery to replace the lens of the eye and rectify refractive errors. IOLs are composed of two elements: an optic and haptics. The optic is the central area responsible for refraction, and the haptics are the appendages from the center optic that hold it in place.

Due to the complex systemic condition of the patient and

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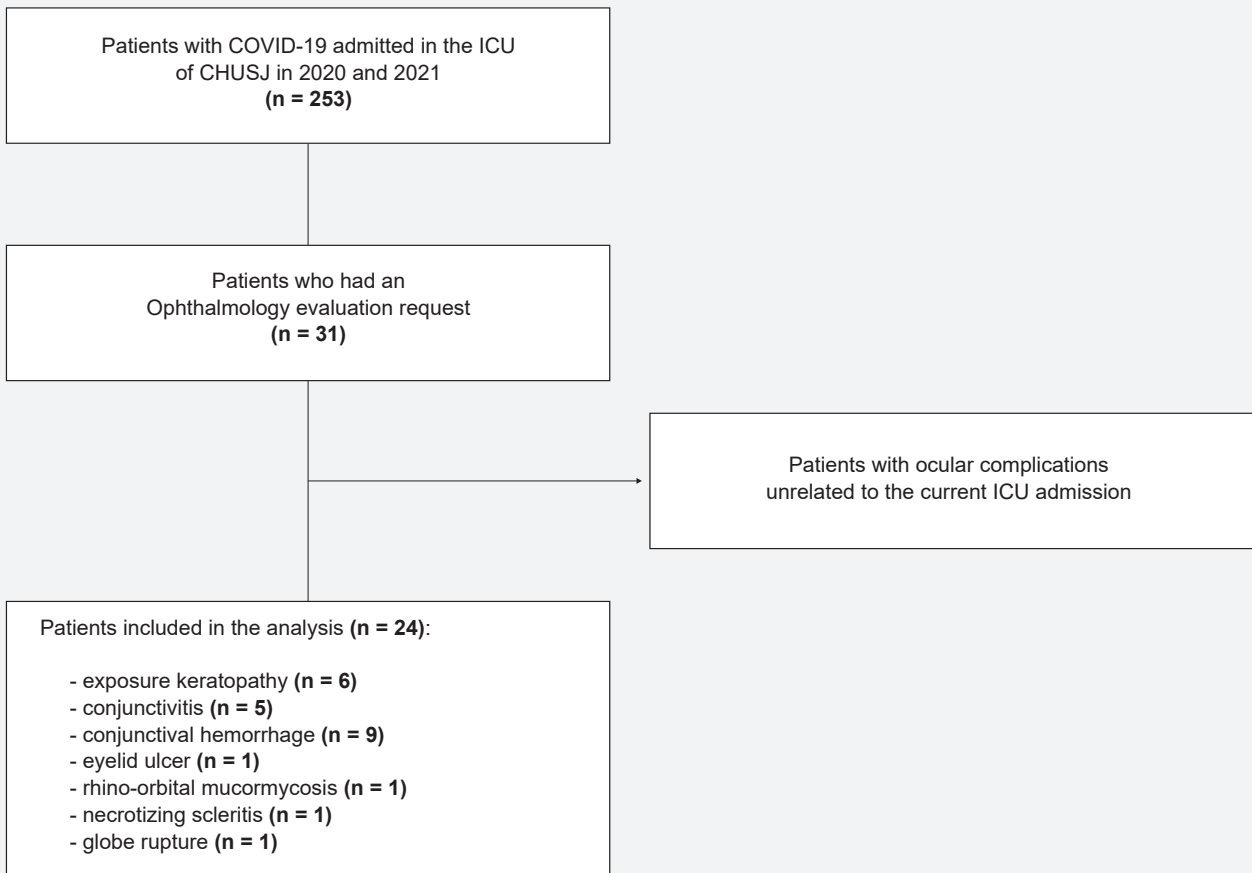


Figure 1 – Flow diagram of patient selection

the absence of light perception in the right eye, a conservative surgical approach was carried out, which comprised the removal of the exteriorized intraocular lens haptic, and closure of the sclera and overlying conjunctiva.⁵ The prone position is associated with elevated intraocular pressure⁶ and the patient had undergone large-incision cataract removal, which led to scleral fragility, and these are the two main risk factors for the development of this condition.

This study outlines the variety of ophthalmic complications encountered in critical care settings in COVID-19 patients, some of which can result in irreversible blindness and facial deformities.

Given the complex systemic condition of these patients, the low frequency of complications found in this evaluation is reassuring, which may be explained by the preventive measures implemented in the ICU, and the close collaboration with the ophthalmology department. It should be emphasized that all the patients admitted to the ICU received three drops of hypromellose 0.3% three times a day. In pa-

tients with incomplete eye closure and in prone position, adhesive tape was used to keep the eyelids closed.

In conclusion, as critical care evolves and its survival rates rise, so does the duty to facilitate these patients' full recovery. To reduce the occurrence of potentially sight-threatening conditions, prophylactic measures and an eye care protocol must constitute priorities in all units, without shifting the focus from life-saving measures.

PROTECTION OF HUMANS AND ANIMALS

The authors declare that the procedures were followed according to the regulations established by the Clinical Research and Ethics Committee and to the Helsinki Declaration of the World Medical Association updated in 2013.

DATA CONFIDENTIALITY

The authors declare having followed the protocols in use at their working center regarding patients' data publication.

AUTHOR CONTRIBUTIONS

SC, MLF, JPC: Study design, data acquisition and analysis, drafting and approval of the final version of the manuscript.

MF, JAP: Study design, critical review, and approval of the final version of the manuscript.

COMPETING INTERESTS

All authors are part of the Ethics Committee of the Centro Hospitalar Universitário de São João.

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