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Editorial

Vasooclusive Disorder of the Retinal Vein: Ophthalmovigilance in COVID-19

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Retinal vein occlusion (RVO) as a vasooclusive disorder of the retinal vein is the most common, after diabetic retinopathy, visually disabling disease affecting the retina [1] and representing a major cause of vision loss and even blindness [2].

In a recent analysis of pooled data from population studies worldwide, the overall RVO prevalence was 0.77% (0.64% branch retinal vein occlusion (BRVO), 0.13% central retinal vein occlusion (CRVO), translating to 28.06 million individuals worldwide affected by RVO [3]. Vasooclusive disorder of the retinal vein has the potential for significant vision-related morbidity.

The first case of CRVO was reported by Richard Liebreich in 1855 [4].

The first case of BRVO was reported by Theodor Leber in 1877 [5].

Despite being recognized in the 19th century there are still gaps in understanding the etiology and pathogenesis of vasooclusive disorders of the central retinal vein and its branches.

Although it is more common in the middle-aged and elderly population, no age group is immune to it. The pathogenesis of RVO has varied systemic and local implications. Known risk factors for RVO include systemic vascular disease, hypertension, diabetes mellitus, hyperlipidemia and glaucoma. Hypercoagulable states are associated with RVO including primary hypercoagulable states with a defect in the physiological anticoagulant mechanism and secondary hypercoagulable states, which are conditions, associated with an increased risk of thrombosis. Novel coronavirus "Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)", the outbreak of which, representing "a public health emergency of international concern" [6] announced by the World Health Organization (WHO) on the 30th of January, 2020, could also cause vasooclusion of the retinal vein**.** There is a growing body of evidence that SARS-CoV-2 affects not only anterior surface of the eye, commonly manifesting by viral conjunctivitis due to direct contact of virus with mucous membrane, but also the posterior segment, specifically the retina. The proposed mechanism of destructive impact includes triggered inflammatory response followed by endothelial dysfunction [7,8], platelet activation and hypercoagulability [9] resulting in COVID-19 related RVO with or without specific systemic comorbidity in generally healthy and also young adults.

The incidence of vasooclusion of the retinal vein in patients positively tested for the COVID-19 is rapidly growing [10-23]. It is worthy to note that the obstruction is located not only in central retinal vein [10-19], but also in two [20] or in one of the branches of the central vein [21]. Bilateral case of CRVO was also documented in severe COVID-19 illness [22].

Based on findings of currently presented RVO cases it will be concluded that occlusion has shown different types of manifestation in COVID-19: initially without any sign of viral infection, with its subsequent development [17] or simultaneous presentation with any de-

gree of disease severity [12,14,15,23]. As was aforementioned no age group is immune to RVO in general, but its strictly corresponds with COVID-related cases. The majority of patients were in 25-50 years age group.

Adequate treatment is a significant unmet clinical need in RVO, specifically in COVID-related cases. Venkatesh., *et al.* [24] advocated the use of low-dose aspirin based on its anti-coagulant properties intended to resorb a blood clot or to prevent its formation as a preventive measure in patients with COVID-19 illness.

Currently available findings reflecting the general consensus [25] indicate a causal relationship between COVID-19 morbidity and RVO.

At present ophthalmologists and health care workers should be aware of such evidenced ocular comorbidity in COVID-19 illness, as a vasoocclusion of the retinal vein. Likelihood of this relationship should be borne in mind. Taken into account that retinal vessels networks represent a target for thromboemboly caused by SARS-CoV-2 virus, ophthalmologists should remain vigilant in RVO cases, especially with asymptomatic patients and a rapid antigen test for COVID-19 will be done. Early identification and prompt management of patients with vasooclusive disorder of the retinal vein can lessen disease severity and help achieve earlier resolution.

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