Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Retinal artery/vein occlusion complicating SARS-CoV-2 vaccinations

Letter to the Editor

We read with interest the review article by Su et al. about central retinal artery/vein occlusion following a SARS-CoV-2 vaccination.[1] Altogether, six patients from 5 articles were retrieved as per the 10th January 2022 upon an appropriate search in the database PubMed.[1] It was concluded that vaccine-related central retinal artery/vein occlusion is a rare complication of SARS-CoV-2 vaccination and that a temporal sequence does not establish a causal link.[1] The study is attractive but raises concerns that should be discussed.

The design of the study does not allow drawing conclusions as presented. At maximum it can be concluded that SARS-CoV-2 vaccination related central retinal artery/vein occlusion is not frequently reported. However, it cannot be concluded that central retinal artery/vein occlusion is a rare complication of vaccinations. Studies with another design (prospective multi-center studies) are required to assess the actual frequency of central retinal artery/vein occlusion after vaccinations. Most likely, the actual frequency is higher as not each case is published.

Matching with this consideration, several other cases of vaccine-related occlusion of the central retinal artery/vein have been reported after the 10th January 2022. Chen et al. reported a 48yo female who developed sudden onset of inferior visual field defects in the left eye four weeks following the first dose of the ChAdOx1 (Astra Zeneca) vaccine (AZV).[2] Romano et al. reported a 54yo female who developed central retinal vein occlusion 2 days after the second dose of the AZV.[3] Retinal vein occlusion was also diagnosed in a 28yo male after the third AZV dose.[4] In a retrospective study evaluating data between May 1st and October 31st 2021, 14 patients with retinal vascular occlusions after COVID vaccinations were collected.[5] Two patients with retinal ischemic events after application of the Moderna vaccine (MOV) respectively the Johnson & Johnson vaccine (JJV) have been recently reported.[6] Kang et al. reported a 64yo male who experienced a branch retinal artery occlusion three days after the first dose of the Biontech Pfizer vaccine (BPV).[7] A 76yo female developed unilateral, painless visual loss 2 days after the first dose of the AZV.[8] Four patients experienced branch retinal artery occlusion 22.8 days on the average after the last vaccine dose application.[9] In a study of 11 patients with visual complaints after SARS-CoV-2 vaccinations, 5 had retinal artery occlusion and four had retinal vein occlusion.[10] Retinal arteriovenous occlusion was reported one day after the first dose of the AZV in a 77yo male.[11] Two days after the second dose of the BPV a 38yo male developed branch retinal vein occlusion in the left eye.[12] A 34yo male presented with right retinal branch venous occlusion two days after the first BPV.[13] Retinal vein occlusion has been also reported in 5 patients after the AZV (n=3) or the BPV (n=2) respectively.[14] Combined central retinal artery and vein occlusion together with ischemic optic neuropathy was reported in a 34yo male 10 days after the second BPV dose.[15]

The authors did not include several reports published before the 10th January 2022.[16–23] It should be explained why these cases were not included in the review.

No mention is made of Susac syndrome characterised by retinal vascular occlusions, cerebral micro-angiopathy and hypoacusis. Susac syndrome has not only been reported in association with SARS-CoV-2 vaccinations[2] but also in a patient after smallpox vaccination.[24]

Hyper-viscosity syndrome (HVS) following SARS-CoV-2 vaccinations was not discussed as possibly pathophysiological mechanism explaining central retinal artery/vein occlusion.[25] HVS is related to elevated levels of fibrinogen or immunoglobulins, to dehydration or exsiccosis, oxidative stress, or the inflammatory response to the vaccine.[25]

Overall, the interesting study has some limitations that call the results and their interpretation into question. Clarifying these weaknesses would strengthen the conclusions and could improve the study. Retinal artery/vein occlusions following SARS-CoV-2 vaccinations is more common than anticipated.

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Author contribution

JF: design, literature search, discussion, first draft, critical comments, final approval.

Disclosures

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Compliance with Ethics Guidelines

This article is based on previously conducted studies and does not contain any new studies with human participants or animals performed by any of the authors.

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