



The use of corticosteroids in patients with COVID-19 vaccine-related cerebral venous thrombosis

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We read with great interest the case report authored by Di Pietro et al. [1], which described a case of cerebral venous thrombosis in a female patient after administration of the Ad26.COV2.S vaccine. Interestingly, the patient presented with no thrombocytopenia, and thus vaccine-induced thrombocytopenia with thrombosis, which is more prevalent after administration of vector-based COVID-19 vaccines, was being ruled out. We commend the authors for reporting the case since it paves the way for more investigations on the non-inflammatory-mediated mechanisms that could also involve in the pathophysiology of COVID-19 vaccine-related thrombosis.

Nevertheless, we are concerned with the administration of dexamethasone to the patient to manage cerebral edema and elevated intracranial pressure as described in the case report. While we acknowledge the routine administration of corticosteroids, especially intravenous dexamethasone, in many centers, for the management of elevated intracranial pressure, they are not recommended, especially when the patient had no underlying inflammatory disorder such as Bechet disease or systemic lupus erythematosus. Indeed, the European Stroke Organization guideline for diagnosing and treating cerebral venous thrombosis [2] discourages the administration of corticosteroids in patients with acute cerebral venous thrombosis.

Although no randomized clinical trials have been conducted to determine the efficacy of corticosteroids for

treating elevated intracranial pressure in cerebral venous thrombosis, available observational evidence suggests that they are ineffective. The International Study on Cerebral Veins and Dural Sinus Thrombosis (ISCVT) [3], which analyzed data from 642 patients with cerebral venous thrombosis (including 150 patients treated with corticosteroids), reported no significant difference in the poor outcomes between patients treated and not treated with corticosteroids (odds ratio = 1.50; 95% confidence interval 0.90 to 2.40).

Therefore, instead of administering dexamethasone, the patient should have been administered with osmotic therapies such as hypertonic saline in bolus doses or mannitol, which can reduce intracranial pressure by drawing free water out of the cerebral tissue and into the systemic circulation [4]. Appropriate treatment of elevated intracranial pressure is essential to resolve headaches and prevent visual failure [5].

Declarations

Ethical approval None.

Informed consent Informed consent was obtained from the participant included in the paper.

Conflict of interest None.

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References

1. Di Pietro M, Dono F, Consoli S et al (2022) Cerebral venous thrombosis without thrombocytopenia after a single dose of COVID-19 (Ad26.COV2.S) vaccine injection: a case report [published online ahead of print, 2022 Feb 25]. *Neurol Sci* 1–6
2. Ferro JM, Boussier MG, Canhão P et al (2017) European Stroke Organization guideline for the diagnosis and treatment of cerebral venous thrombosis - endorsed by the European Academy of Neurology. *Eur J Neurol*. 24(10):1203–1213

3. Canhão P, Cortesão A, Cabral M et al (2008) Are steroids useful to treat cerebral venous thrombosis? *Stroke*. 39(1):105–110
4. Cook AM, Morgan Jones G, Hawryluk GWJ et al (2020) Guidelines for the acute treatment of cerebral edema in neurocritical care patients. *Neurocrit Care*. 32(3):647–666
5. Biousse V, Ameri A, Bousser MG (1999) Isolated intracranial hypertension as the only sign of cerebral venous thrombosis. *Neurology*. 53(7):1537–1542

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