Dear Editor,

COVID-19 vaccine rollout is the most important step towards the fight against the ongoing deadly SARS-COV-2 pandemic. As a critical tool, COVID-19 vaccines are rapidly being administered to the millions of people worldwide and the emergence of any adverse reaction to the vaccine challenges the claim for its safety. As of 18 October 2021, India has administered over 986,769,411 vaccine doses of the currently approved vaccines; ChAdOx1-nCOV-19 (brand name “Covishield™”) has been used with highest proportion.[1]

Vaccine-induced Thrombotic Thrombocytopenia (VITT) has been documented to be associated with COVID-19 vaccines since the initial stages of the administration.[2-5] Recently, cases with accelerated hypertension and intracerebral hemorrhage without thrombocytopenia have also been reported.[6,7] We, herein, report a case of primary intracerebral hemorrhage with accelerated hypertension within 8 hours of the first dose of COVID-19 vaccination.

A 60-year female, known hypertensive with well-controlled blood pressure on treatment, presented with dizziness and weakness of the right half of body 8 hours after having received the first dose of COVID-19 vaccine (Covishield™). Examination revealed blood pressure of 200/110 mm of Hg, disorientation, right hemiplegia and right gaze paresis. CT scan head revealed left thalamic bleed with intraventricular extension. CT angiogram was normal. MRI brain and venogram did not reveal venous sinus thrombosis [Figure 1]. Complete blood count, platelet count, kidney function and liver function tests were normal. D-Dimer was 1500 ng/ml. Prothrombin test, INR and CRP levels were well within normal range. Electrocardiogram was unremarkable. The patient was given antihypertensives, decongestants and other supportive treatment. The patient did not require any neurosurgical intervention. Disorientation and gaze paresis improved over 6 days of hospital stay, she could follow verbal commands and communicate with her relatives. She was discharged with minimal residual right hemiparesis.

Recombinant viral vectored (ChAdOx1-nCOV-19 and Ad26-COV2.S) vaccine administration has been reported to be associated with cerebral venous thrombosis, thrombocytopenia and positive Platelet Factor-4 autoantibodies, presenting as intracerebral hemorrhage. Several cases have been reported from USA and Europe. Furthermore, CDC and FDA recommended a temporary pause in vaccination with Ad26-COV2.S (Janssen) following the emergence of these cases.[8] Thrombohemorrhagic complications have been reported at a higher rate, after ChAdOx1-nCOV-19 (Astra-Zeneca) COVID-19 vaccination compared to BNT162b2 (Pfizer) COVID-19 vaccination among vaccine recipients in Europe. Immunogenicity to
the vaccine-induced production of spike protein has been hypothesized to be among the possible factors resulting in this autoimmune response. VITT has been described very similar to heparin-induced thrombocytopenia (HIT). Predominantly, young females are affected on 2nd – 4th week of vaccination. Very recently, a case report described large primary parenchymal hemorrhage on day 5 of the first dose of ChAdOx1-COV-19 vaccination. The authors did not find evidence of thrombocytopenia and or thrombosis. They raised the concern of primary intracerebral hemorrhage post-COVID-19 vaccination besides, out of the context VITT. Our patient also presented with primary intracerebral hemorrhage, and sudden rise in blood pressure was documented in post-vaccination period. Possible association of accelerated hypertension following vaccine administration is described owing to the vaccine component polyethylene glycol, however, it seems unlikely in our case because ChAdOx1-nCoV-19 (Covishield) lacks this component. Stress response could be a likely explanation but it was not evident immediately after vaccination. The interaction between the spike protein and ACE 2 receptors resulting in accelerated hypertension seems to be a plausible hypothesis. Although, a causal relationship is difficult to establish, however, a close temporal association with COVID-19 vaccination in the present case warrants for vigilance and vaccine safety surveillance following its administration. Stroke has been listed as Adverse Events of Special Interest (AESI) in US Vaccine Adverse Event Reporting System (VAERS), however, the Brighton Collaboration case definition for stroke is still under development.

Currently, the overall benefits of COVID-19 vaccines definitely seem to outweigh the associated extremely rare serious adverse reactions. Although, the risk is minuscule, blood pressure monitoring and its optimization pre and post COVID-19 vaccination might be necessary to ensure vaccine safety especially in an elderly.

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Conflicts of interest
There are no conflicts of interest.

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