



Case series

A Case Series of Stroke following COVID-19 Vaccination—Is It Just an Association?

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ABSTRACT

In India two vaccines were initially recommended for vaccination; Covaxin in the 3rd phase trial and Covishield in the 4th phase for coronavirus disease 2019 (COVID-19). Covaxin was approved to be given only in tertiary care health centers and urban areas. An adverse event is any untoward medical problem in a patient after the administration of a new drug or vaccine that may or may not be related to that product. There are several case reports of stroke following COVID-19 vaccination. Here, we have reported five cases of ischemic stroke following COVID-19 vaccination presenting to the neuro-outpatient department or casualty. We have taken three patients who were vaccinated with Covishield and presented with acute neurological deficit within 24 hours of vaccination. All patients were COVID-19 reverse transcription-polymerase chain reaction negative. Computed tomography brain, magnetic resonance imaging brain, echocardiography, carotid Doppler study, and other routine blood investigations were done on all patients. All the three patients were male in the age group of 30 to 60 years. All were ischemic strokes. All patients had associated other risk factors for stroke. None of them had thrombocytopenia. The proposed mechanism is vaccine-induced immune thrombotic thrombocytopenia. One patient had a posterior circulation stroke. Two patients recovered and one patient was in critical condition and left against medical advice. We cannot conclude that the thrombotic events were due to the vaccine only as other risk factors were also present. Weighing the beneficial effect of vaccines these complications can be called mere associations. But since these can be serious adverse effects of vaccines, more and more studies are required to prove vaccines as the causative agent of thrombotic stroke.

Keywords: Covaxin, Covishield, Stroke, Thrombocytopenia

INTRODUCTION

Vaccines are the only hope for preventing serious illness and death when coronavirus disease 2019 (COVID-19) pandemic has created a panic situation all over the world.^[1] In India, initially only two vaccines were approved, Covishield and Covaxin. Covishield, produced by Serum Institute of India, is a recombinant, replication-deficient chimpanzee adenovirus vector encoding the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) spike (S) glycoprotein produced in genetically modified human embryonic kidney cells. It contains genetically modified virus. Adverse reactions are mild to moderate and resolve within few days. A very rare and serious complication of thrombosis both arterial and venous and thrombocytopenia is described in the literature.^[2] Covaxin, produced by Bharat Biotech (Whole Virion Inactivated Corona Virus Vaccine), is indicated for active immunization against SARS-CoV-2 virus infection for

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age ≥ 18 years in phase 3 trial. No vaccine-related adverse event was seen in phase 2 trial.^[3]

We report the clinical profile, radiological findings, and outcome of three patients presenting with stroke within a week of vaccination.

Methods

We have taken cases presenting to our outpatient department or emergency unit with stroke with history of COVID-19 vaccination within a week. All the cases were evaluated in detail starting from clinical history, computed tomography and magnetic resonance imaging (MRI) of the brain, echocardiography, and B/L carotid Doppler study to find out other associated risk factors for stroke. All patients were COVID-19 reverse transcription-polymerase chain reaction negative.

CASE SERIES

Case 1

A 32-year-old male presented with sudden onset slurred speech, dysphagia, and facial deviation to the right 3 days after taking first dose of Covishield. He had no history of any chronic illness. On examination the patient was conscious with mild ptosis of left eye, left upper motor neuron (UMN) 7th, 9th, and 10th cranial nerve palsy. Muscle power was 5/5 in all limbs. Mild left upper limb ataxia was present. Patient was admitted with a diagnosis of left lateral medullary syndrome. MRI brain with MR angiography revealed acute infarct in left medulla oblongata and cerebellar hemisphere and thrombosis of intracranial segment of left vertebral artery. All routine investigations were normal. Antinuclear antibodies profile, sickling test, and thrombotic profile were negative. Day 2 echocardiography revealed arrhythmogenic ventricular dysplasia. Patient was treated with aspirin, atorvastatin, and β -blockers and was discharged in stable condition after 7 days.

Case 2

A 51-year-old male known diabetic and hypertensive developed sudden onset weakness of right upper limb and lower limb 6 days after taking second dose of Covishield vaccine. Patient was conscious oriented with right UMN facial palsy and right hemiparesis. MRI brain showed a small infarct in the left gangliocapsular region. All routine investigations were normal except for high blood sugar which was controlled with injection insulin. Day 2 echocardiography showed concentric left ventricular hypertrophy. Patient was managed with aspirin, atorvastatin, antihypertensives, and insulin. He was discharged in a stable condition after 5 days.

Case 3

A 58-year-old male presented to the emergency unit with altered sensorium and weakness of right side of body 2 days after taking second dose of Covishield. He is a known diabetic, hypertensive with coronary artery disease, and post-coronary artery bypass graft status. MRI brain revealed left middle cerebral artery territory infarct with hemorrhagic transformation with mass effect. Patient was managed in the intensive care unit with hypertonic saline, aspirin, atorvastatin, and antibiotics. After 1 week the patient developed sepsis. The attendants took the patient to other hospital at their own risk.

DISCUSSION

All three cases were within 30- to 50-year-old age group. All had preexisting risk factors for stroke. All cases were after taking Covishield; one after first dose and two cases after taking second dose. Vaccine-induced immune thrombotic thrombocytopenia (VITT) is the most likely cause leading to thrombosis after receiving a vector-based COVID-19 vaccine.^[4] According to the literature this type of thrombosis is similar to the mechanism of heparin-induced thrombocytopenia, a condition that can occur after the use of heparin.^[5] Greinacher studied the clinical and laboratory features of 11 patients of median age of 36 years in Austria and Germany who developed thrombosis or thrombocytopenia following vaccination with ChAdOx1 nCov-19 (AstraZeneca). In our cases none of the patients had thrombocytopenia. So, there may be several mechanisms of thrombosis which are not yet known. All were middle-aged males. As all patients had preexisting cardiac disease or other risk factors for stroke, so only vaccine cannot be attributed as the cause of stroke. The benefit of vaccine outweighs the risk which is very rare.

CONCLUSION

Vector-based COVID-19 vaccines might lead to rare type of thrombosis process via VITT. The number of case reports of stroke following COVID-19 vaccination is not significant at present and published studies were mostly based on case series. So, it may be just an association. However, larger studies are needed to confirm the causative link.

Conflicts of interest

None.

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