CASE REPORT

Acute ischemic stroke during the convalescent phase of asymptomatic COVID-2019 infection in young male

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ABSTRACT

Severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) initially most appreciated for its pulmonary symptoms, is now increasingly recognized for causing multi-organ disease and stroke in the setting of a hyper-coagulable state. Acute ischemic stroke (AIS) has not been described as late sequelae in patients without respiratory symptoms of COVID-19. Here we report a case of 15 year old male with post COVID-19 status who developed acute malignant middle cerebral artery infarction due to occlusion of left terminal internal carotid artery, left middle cerebral artery stem and A1 segment of left anterior cerebral artery who undergone successful intravenous thrombolysis followed by mechanical thrombectomy and decompressive craniectomy.

INTRODUCTION

The SARS-CoV-2 coronavirus was first appreciated for causing severe respiratory symptoms.[1,2] However, reports have emerged describing extra pulmonary involvement and in particular an increased risk for venous and arterial thromboembolism in the form of acute ischemic stroke.[3-5] Acute ischemic stroke (AIS) is a life-threatening central nervous system (CNS) complication of COVID-19 infection primarily mediated by inflammation, direct endothelial dysfunction, thrombin generation, and platelet activation.[6] According to a report the World Stroke Organization, the risk of ischemic stroke during COVID-19 infection is around 5%.[7] More alarming are the reports of acute ischemic stroke in patients younger than 50 years of age with SARS-CoV-2 infection, a patient population in which ischemic strokes are relatively infrequent but potentially disabling.[5,8] In this case report, we describe a young patient with extensive large vessel thrombosis in the setting of recent history of SARS-CoV-2 infection.

CASE

15-year-oldmale, without any previous comorbidities and no personal or family history of thrombo-embolic events in first degree relatives presented to emergency department with seizure,right sided hemiparesis and dysarthria within 3 hours of symptoms onset. On examination, his temperature was 98F, pulse rate was 78 beats / min, blood pressure was 150/80 mm hg, respiratory rate was 24/min and oxygen saturation was 98% on room air. His GCS was E1M5V1, had paucity of movements on right sided limbs, left sided gaze preference and modified Rankin scale (mRS) score was 5. He had history of covid-19 infection 20 days prior to presentation.His CT scan brain was suggestive of hyper-dens MCA on left side. His MRI brain was suggestive of large area of hyper-acute non-hemorrhagic infarction involving left frontal, parietal and temporal lobe, left ganglio-capsular region and left insular cortex (in territory of left MCA and ACA). His MR angiography of brain and neck region was suggestive of moderate to significant thrombotic occlusion of various segments of left ICA, left MCA and A1 segment of left ACA. His ASPECT score was <3/10 and NIHHS was 17. As patient was presented within window period, IV thrombolysis followed by intra-arterial mechanical thrombectomy was performed. Following mechanicalthrombectomy partial re-canalization of left MCA territory was observed. Post mechanical thrombectomy CT scan brain was carried out which was suggestive of left cerebral edema and mid line shift of 7-8 mm to the right. For which immediate left fronto-temporo-parietal decompression craniectomy was performed. Post-decompression craniectomy MD-CT scan of brain showed decrease in mid line shift (5-6 mm) and left cerebral edema with new appearance ofminimal SDH along the left tentorium cerebelli. Laboratory findings demonstrated that a hemoglobin concentration was 14.2 gm/dl, total WBC counts were 14,800/cumm,

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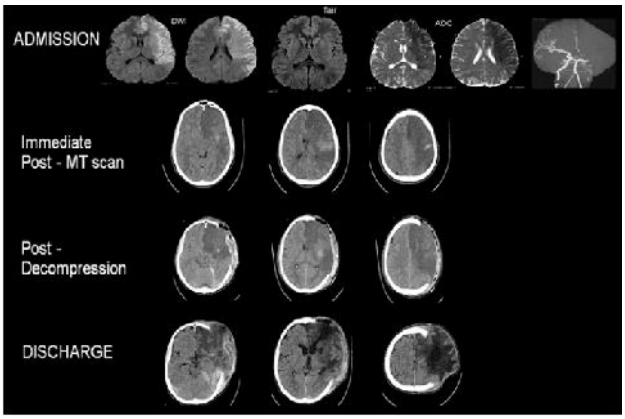
platelet counts 3,83,000/cumm, PT/INR was 14.9 sec/1.10, D-dimer was 300ng FEU/ml (normal range: <500 FEU/ml). There was no abnormality in liver and kidney function test.S.lipid profile was normal. Serum homocystein level was 13.4 micromol/L (normal range: 6.6-14.8 micromol).C-ANCA,P-ANCA, anti-phospholipid antibody profile, ANA by IF were negative. SARS-CoV-2 IgG was 28.9 AU/ml (normal range: 12-15 AU/ml). Patient was hospitalized from 18/5/2021 to14/6/2021. He was treated with single antiplatelet, anti-epileptic drug and supportive medications and discharged with power of 2/5 on right, improved speech and mRS score of 4.



DISCUSSION

This is the youngest case reported in India with acute ischemic stroke due to large vessel occlusion in convalescent phase of COVID-19 infection, which hadundergone successful intravenous thrombolysis followed by mechanical thrombectomy and decompressive craniectomy. One case series published in April 2021 highlights that adults 50 years or younger with asymptomatic or pauci-symptomatic COVID-19 infection diagnosed by positive SARS-CoV-2 serological test result may present with ischemic stroke during the convalescent phase of the infection.[9] This finding underscores the value of SARS-CoV-2 serological testing during the etiologicalworkup of patients who experienced AIS, given that a negative result from an RT-PCR testis expected during this period.[9] The presence of these antibodies in younger adults coupled with the lack of traditional cardiovascular risk factors suggests an etiological association. In addition, with an estimated production and persistence of COVID-19 antibodies about 2 weeks (although ranging from 1 to 6 weeks) after the initial COVID-19 infection[10], coagulopathy may likely be observed for months after the initial exposure in patients with a subclinical COVID-19 infection.[11] Despite assessing a thorough stroke workup, we were unable to find an underlying mechanism except the unifying positive SARS-CoV-2 serological test. The sustained prothrombotic mechanism in the convalescent phase of COVID-19 infection is currently uncertain and is an area of active research. In addition, the mechanism of stroke in patients with asymptomatic or mildly symptomatic COVID-19 infection likely differs from the mechanism in critically ill patients in the intensive care unit who have active respiratory COVID-19 infection. Overt inflammatory response and cytokine storm seen in critically ill patients with COVID-19 infection are factors in stroke through possible endothelial injury, in which elevated D-dimer levels have been found to be associated with arterial thrombotic events in patients with active COVID-19 infection.[12,13] However, a recent coagulation study of patients 4 months after the resolution of respiratory COVID-19 infection demonstrated normal prothrombin time, fibrinogen level, D-dimer level, and von Willebrand factor antigen compared with levels in healthy control patients.[14] This finding was consistent with the results of our case. One meta-analysis study published in February 2016 highlights that modern endovascular thrombectomy added to best medical therapy more than doubles the odds of recovery compared with best medical therapy alone in patients with AIS due to anterior circulation large vessel occlusion presents within 5 hours of stroke symptoms onset.[15]

CONCLUSION

This case report highlights the significance of serological evidence of SARS Cov-2 antibodies as a part of etiological work up in stroke patients without presence of any traditional risk factors. It also highlights that patient with acute ischemic stroke with confirmed large vessel occlusion of the anterior circulation who are treated with intravenous thrombolysis with mechanical thrombectomy within 6 hours after symptom onset improves functional outcomes and even at very young age it is very safe.

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