

# Stroke Patients Without COVID-19 Symptoms Is There a Need to Screen?

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**Introduction:** COVID-19 patients who present with strokes but without typical COVID-19 symptoms have been described in small numbers. Despite the paucity of fever and respiratory symptoms, they remain capable of infecting others. The patient we discuss herein highlights the important issues of strokes as presenting events of COVID-19 infections, and how testing for COVID-19 in stroke patients, even when asymptomatic for COVID-19, can play an important role in infection control, clinical management and outcomes amidst this global pandemic.

**Case Report:** A 45-year-old male resident of a dormitory presented to our unit with acute vertigo and left-sided dysmetria. NIHSS was 2. The initial magnetic resonance imaging demonstrated infarction of the left cerebellar hemisphere, middle cerebellar peduncle and hemipons. An extensive work-up for stroke etiologies was unremarkable. Despite having no fever, respiratory symptoms, anosmia or ageusia, he was isolated and screened for COVID-19 due to his epidemiologic risks, with multiple residents from his dormitory being recently diagnosed with COVID-19. Confirming our suspicion, his respiratory samples returned positive for COVID-19. His D-dimer levels returned normal. Thereafter, the patient underwent posterior decompression surgery due to worsening edema caused by the cerebellar infarct. He was started on antiplatelet therapy and recovered significantly a month from presentation with an modified Rankin Score of 2. He remained without typical COVID-19 symptoms.

**Conclusion:** Our patient's case clearly supports the screening for COVID-19 in stroke patients who are without COVID-19 symptoms, appreciating the significant value it adds to infection control, clinical management, and outcomes amidst this global pandemic.

**Key Words:** COVID-19, stroke, infection control, asymptomatic COVID-19  
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## CASE PRESENTATION

A 45-year-old Bangladeshi man presented 2 days after experiencing acute vertigo. He reported no fever, respiratory symptoms, anosmia or ageusia. He had neither vascular risk factors nor a family history of stroke. He stays in a dormitory, from which multiple residents were tested positive for COVID-19. Examination revealed multidirectional gaze-evoked nystagmus and left-sided dysmetria, and his National Institute of Health Stroke Scale (NIHSS) score at presentation was 2. Computed tomography (CT) demonstrated established infarction involving the left cerebellar hemisphere, middle cerebellar peduncle and hemipons, with cerebral edema and mass effect (Figs. 1A, B). CT

angiography of the intracranial arteries showed no occlusion. The left vertebral artery appeared small but without features of dissection or steno-occlusive disease (Fig. 1C).

White cell count was elevated at 10.76/mm<sup>3</sup>. Lactate dehydrogenase (395 U/L), C-reactive protein (3.5 mg/L), D-dimer (0.33 mg/L), prothrombin time, activated partial thromboplastin time, and a chest radiograph were normal. Tests for diabetes mellitus, hyperlipidaemia, and thyroid diseases returned negative. Transthoracic echocardiogram and telemetry over 48 hours were unremarkable. Autoimmune tests were normal for anti-nuclear, anti-double stranded DNA, anti-neutrophil cytoplasmic and anti-cardiolipin antibodies. Lupus anticoagulant could not be tested due to logistical difficulties. CT 1 day later demonstrated worsening of the left tonsillar herniation with early features of hydrocephalus, for which he underwent emergency decompressive surgery.

Because of his epidemiological risk, he was isolated and screened for COVID-19. Confirming our suspicions, his respiratory samples tested positive for SARS-CoV-2 on reverse transcription real-time polymerase chain reaction. In the absence of typical causes of ischemic strokes despite extensive tests, his stroke was deemed to be COVID-19 related. He was started on antiplatelet therapy and recovered significantly a month from presentation, with a modified Rankin Score (mRS) of 2. He continued to be without typical COVID-19 symptoms.

## DISCUSSION

Stroke in COVID-19 patients occur at an incidence between 2.8% and 5%.<sup>1,2</sup> Ominously, strokes can be the sole presenting event in COVID-19 patients. Among the 214 COVID-19 patients in a Chinese study, 6 experienced strokes, of which 2 presented without typical COVID-19 symptoms.<sup>1</sup> This observation was mirrored in a New York report of 5 young COVID-19 patients with large-vessel strokes, of which 2 had no COVID-19 symptoms.<sup>2</sup> COVID-19 patients without typical symptoms are particularly worrisome from the epidemiological perspective, as they are difficult to detect by our health care systems while remaining significantly infectious.<sup>3</sup> Studies from Japan and China estimated the percentage of asymptomatic patients at 30.8% to 75%.<sup>4,5</sup> Their infectiousness is evident in epidemiologic reports from China, with multiple cases of asymptomatic and pre-symptomatic transmissions early in the pandemic.<sup>5</sup> Furthermore, demonstration of SARS-CoV2 reverse transcription real-time polymerase chain reaction Ct values of 14 to 40 and the successful culture of the virus in these patients provided credible virologic evidence of infectiousness.<sup>6</sup> Thus, screening of stroke patients who are otherwise asymptomatic for COVID-19, can be invaluable in limiting further transmission.

In addition, the identification of COVID-19 in stroke patients influences their clinical management and outcome. Strokes in COVID-19 patients increase mortality by 5-fold, and screening allows for timelier identification of those at risk of poorer outcomes.<sup>7</sup> Moreover, detection of concomitant COVID-19 infections among stroke patients may influence the investigative work-up for stroke etiologies. With COVID-19 related

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The authors declare no conflict of interest.

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**FIGURE 1.** Computed tomography (CT) of the brain, showing hypodensity of the left cerebral hemisphere and middle cerebellar peduncle, with cerebral edema and mass effect on axial (A) and coronal (B) projections, consistent with a sizeable infarct. CT angiography of the intracranial arteries showed no occlusion. The left vertebral artery appeared small in caliber without features of dissection or stenotic disease (C).

prothrombotic state being described as a possible stroke mechanism, D-dimer levels may be helpful in identifying stroke patients who are at risk of further COVID-19 related thrombotic complications, and guide the initiation of anticoagulation.<sup>8,9</sup>

In conclusion, our patient's case clearly supports the screening for COVID-19 in stroke patients who are without COVID-19 symptoms, appreciating the significant value it adds to infection control, clinical management and outcomes amidst this global pandemic.

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