Acute Hemorrhagic Necrotizing Encephalopathy Secondary to COVID-19 Infection

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Case Description

The patient was admitted to the hospital for acute hypoxic respiratory failure secondary to COVID-19 pneumonia requiring intubation. 3 weeks into admission patient was extubated and the following day, she developed a new right facial droop, mild right arm drift, altered mental status with no other focal neurologic deficits.

Patient

The patient is a 63 year old female with past medical history of type 2 diabetes mellitus complicated by chronic kidney disease, hypertension, asthma, and thyroid cancer s/p thyroidectomy who presents with fevers, cough, and shortness of breath.

Assessments and Results

Initial CT scan did not show acute abnormalities. Due to instability of her respiratory status, MRI was deferred for a few days. When MRI was obtained, she was found to have numerous punctate foci of hemorrhage scattered throughout the cerebral white matter predominantly involving the splenium of the corpus callosum, reflecting acute hemorrhagic necrotizing encephalopathy.

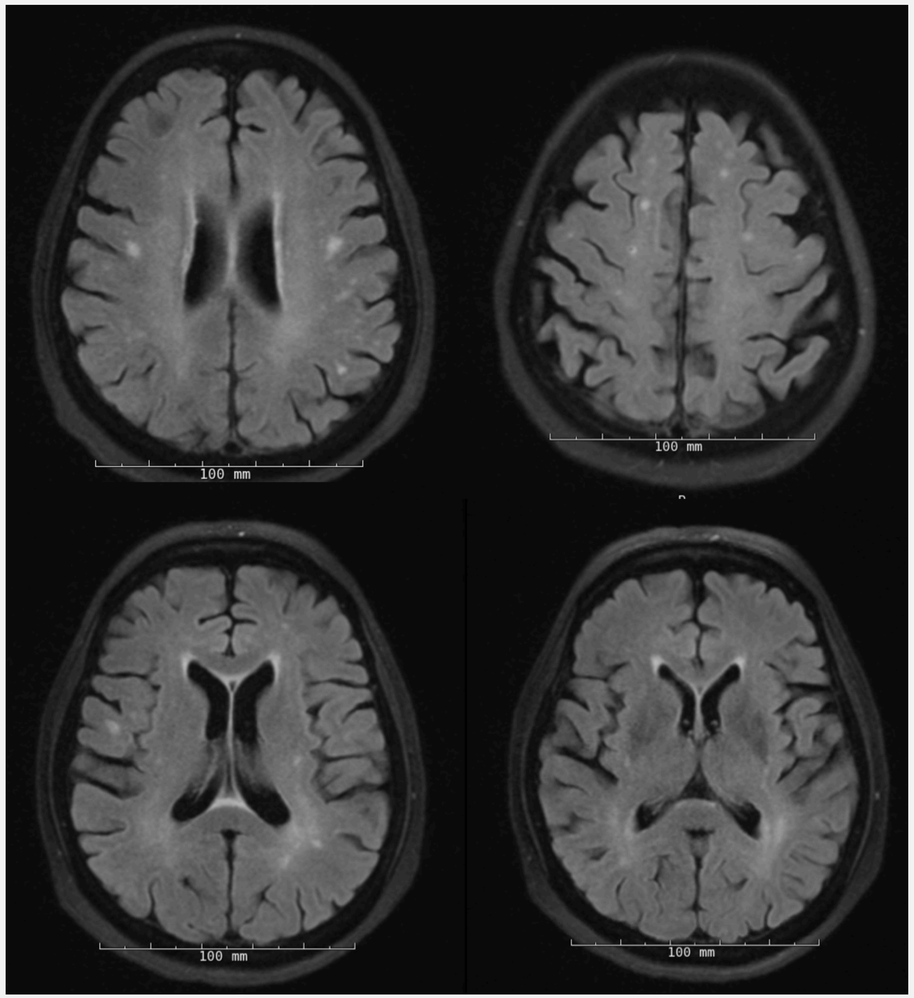

Figure 1

T2-weighted fluid-attenuated MRI demonstrates punctate hyperintensity within the cerebral white matter and splenium

Discussion

Acute hemorrhagic necrotizing encephalopathy is a rare complication of viral illness, most often associated with influenza A and H1N1. There have been a few case reports that have linked COVID-19 infection with acute hemorrhagic necrotizing encephalopathy. Symptoms can include altered mental status, seizures, hallucinations, ataxia, and change in muscle tone following flu-like illness. The pathophysiology is thought to be linked to intracranial cytokine storm causing a breakdown in the blood-brain barrier. On imaging, characteristic findings include symmetric, multifocal lesions within the thalamus, brain stem, cerebral white matter and cerebellum with hemorrhage.

Conclusion

COVID-19 infections have been associated with multi-organ complications including ARDS and acute renal failure, and less commonly neurological manifestations. Many patients with COVID-19 infections have changes in levels of consciousness often attributed to hypoxia or other multi-organ failure. It is important to include neurological conditions in the differential and to consider brain imaging in the work up.

Reference

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