

Letter: Dismantling the Apocalypse Narrative: The Myth of the COVID-19 Stroke

To the Editor:

It has recently been claimed and widely publicized that young, healthy individuals with mild COVID-19 are at increased risk of ischemic stroke.¹⁻³ Such scientifically unfounded claims can potentially exacerbate the current state of collective anxiety surrounding this pandemic. As a result, young people with other illnesses may decide to stay home, seeking to avoid hospitals at all costs, ultimately suffering harmful delays in medical care. In fact, during the pandemic, stroke centers, including ours (Table), have experienced significant reductions, rather than increases in the rates of strokes, large vessel occlusions (LVOs), and thrombectomies. A recent study found a 39% nationwide reduction in neuroimaging for acute stroke, a surrogate measure of endovascular thrombectomy for LVO.⁴ Likewise, a 38% nationwide drop in ST-elevation myocardial infarction catheterization lab activations has been documented during this period.⁵

It is well established that coagulation abnormalities are common among patients with severe COVID-19, potentially leading to life-threatening arterial and venous thrombotic events, including stroke.⁶⁻¹⁰ In one Chinese study, 5% to 6% of COVID-19 patients experienced a stroke.⁸ In contrast, one healthcare system in New York City (NYC) reported that among 3556 hospitalized COVID-19 patients, only 0.9% had an imaging-proven ischemic stroke.¹⁰ However, notwithstanding the clear association between severe COVID-19 and stroke, it remains unclear whether COVID-19 sepsis results in higher risks of thromboembolic complications and stroke relative to other types of sepsis.

In fact, stroke is a very well-known complication of sepsis and respiratory infections.¹¹⁻¹³ Up to a 5-fold increase in the risk of ischemic stroke has been reported in the first two weeks following sepsis.^{11,12} Moreover, up to a third of stroke patients may have had an infection in the preceding week.¹² Furthermore, the risk of first stroke is over 3 times higher in the first 3 d of a respiratory tract infection.¹² In one magnetic resonance imaging study, 29% of patients with septic shock suffered an ischemic stroke.¹³

In contrast to severe COVID-19, there is no evidence that mild disease is associated with coagulopathy, thrombosis, or stroke. Oxley and 15 coauthors² reported a small series of five patients

younger than 50 yr, presumably healthy, presenting with LVO strokes within a 2-wk period in March-April 2020 in NYC. They claim that such a stroke rate would be unusual for their center, which, in the previous year, averaged 0.73 LVOs biweekly. This tiny series lacks scientific rigor. First, 95% confidence intervals were not provided, raising the possibility of random case clustering. Moreover, the arbitrary selection of a 16-d period, extending from a Monday to a Tuesday, raises concern for convenient cherry-picking. In fact, it would have been more scientifically rigorous to study the entire months of March and April, while the number of COVID-19 cases in NYC was surging. If that stroke rate held steady, the authors would have had a 20-patient cohort to report on. Contrary to their claim, 3 of the 5 patients had significant risk factors for stroke, including previous stroke, hyperlipidemia, hypertension, and diabetes. Stroke workup in all patients also appears to be incomplete. Specifically, there was no mention of bubble studies, transesophageal echocardiograms, loop recorder placement, antiphospholipid antibody assays, or homocysteine level measurements. Thus, alternative etiologies of ischemic stroke other than COVID-19 could have been easily overlooked.

More recently, Sweid and 13 coauthors³ from 2 institutions in Philadelphia and NYC reported on fourteen COVID-19 patients with ischemic strokes (12 arterial, 2 venous), who presented within a 3-wk period in March-April 2020. While the authors try to make a similar claim, the vast majority of their patients (12/14) were older than 50 yr and, of the 2 patients younger than 50, 1 had cerebral venous thrombosis. No control group whatsoever was used for comparison. Overall, the vast majority of their patients (12/14) had cardiovascular risk factors (8/14) and/or advanced age (12/14), while 50% (7/14) had pneumonia and/or adult respiratory distress syndrome, suggesting severe COVID-19. Most importantly, there was no mention whatsoever of any etiologic stroke workup in those patients. Therefore, the suggestion of a causal relationship between COVID-19 and stroke remains unfounded.

In summary, there is currently no evidence supporting COVID-19 as a risk factor for stroke, independently of sepsis. Such unsubstantiated and potentially harmful claims should not be widely publicized.

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TABLE. Data from SBH Health System Primary Stroke Center

	Mar-Apr 2020	Jan-Feb 2020	Mar-Apr 2019	Mar-Apr 2018
All strokes	32	61	49	33
LVO strokes	4	2	1	1

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