

AJR study associates COVID-19 with large vessel occlusion strokes

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TABLE 3: Results of Multivariate Logistic Regression Assessing the Association Between Patient Characteristics and Large Vessel Stroke, Controlled for Race and Ethnicity

Characteristic	Odds Ratio for Large Vessel Stroke	p
COVID-19 present	2.4 (2.1–2.7)	0.011 ^a
Age (y)	0.8 (0.6–1.0)	0.622
Male sex	0.9 (0.6–1.1)	0.744
Diabetes mellitus type 2	0.9 (0.6–1.2)	0.673
Hypertension	1.4 (1.0–1.7)	0.331
Coronary artery disease	0.9 (0.4–1.3)	0.962
Congestive heart failure	1.1 (0.8–1.4)	0.361
Dyslipidemia	0.8 (0.5–1.3)	0.352
History of smoking	1.1 (0.9–1.3)	0.421
Atrial fibrillation	0.8 (0.5–1.1)	0.254
Body mass index	1.1 (0.9–1.3)	0.722

Note—Values in parentheses are 95% CIs. COVID-19 = coronavirus disease.
^aStatistically significant at $p < 0.05$.

Note--Values in parentheses are 95% CIs. ^aStatistically significant at p American Journal of Roentgenology (AJR)

An open-access article published in ARRS' *American Journal of Roentgenology* (AJR) investigating the association between coronavirus disease (COVID-19) and stroke subtypes determined that patients with COVID-19 presenting with acute neurologic symptoms warrant a lower threshold for suspicion of large vessel occlusion (LVO) stroke, thus necessitating prompt workup.

"To our knowledge, this is the first study to describe an association between COVID-19 and large vessel strokes," wrote lead investigator Shingo Kihira of the Icahn School of Medicine at Mount Sinai.

This retrospective case-control study included [patients](#) for whom a code for stroke was activated during March 16 to April 30, 2020 at a single system of six hospitals across the New York City boroughs of Manhattan, Queens, and Brooklyn. Demographic data (age, sex, and race or ethnicity), COVID-19 status, stroke-related risk factors, as well as clinical and imaging findings pertaining to stroke were collected from the electronic medical record.

Among the 329 patients (175 [53.2%] men, 154 [46.8%] women; mean age, 66.9 years) in the study sample, 35.3% (116) had [acute ischemic stroke](#) confirmed with imaging; 21.6% (71) had LVO stroke; and 14.6% (48) had small vessel occlusion (SVO) stroke.

The most commonly observed LVO [62.0% (44/71)] was middle cerebral artery segment M1-M2 occlusion. Meanwhile, multifocal LVOs were observed in only 9.9% (7/71) of patients with LVO stroke.

With COVID-19 present in 38.3% (126/329) of patients, the 61.7% (203/329) of patients without COVID-19 formed the negative control group. LVO stroke was present in 31.7% of patients with COVID-19, compared with 15.3% of patients without COVID-19 ($p = 0.001$). SVO stroke was present in 15.9% of patients with COVID-19 and 13.8% of patients without COVID-19 ($p = 0.632$).

As Kihira et al. explained: "In multivariate analysis controlled for race and ethnicity, presence of COVID-19 had a significant independent association with LVO stroke (odds ratio, 2.4) compared with absence of COVID-19 ($p = 0.011$)."

After stratification for race and ethnicity, the results from this AJR study indicate that the risk of large vessel stroke among patients with COVID-19 was 2.4 times as high as that among patients without COVID-19.

"Although the incidence of SARS-CoV-2 infection in New York City is declining, a large population of patients continue to present with COVID-19," Kihira and colleagues noted. Clarifying that COVID-19 is associated with LVO stroke—but not with SVO stroke—the authors of this AJR article reiterated the lower threshold of suspicion for large vessel [stroke](#) in COVID-19 patients who present with acute neurologic symptoms.

More information: Shingo Kihira et al, Association of Coronavirus Disease (COVID-19) With Large Vessel Occlusion Strokes: A Case-Control Study, *American Journal of Roentgenology* (2020). [DOI: 10.2214/AJR.20.23847](https://doi.org/10.2214/AJR.20.23847)

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