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Chest CT Scanning in Suspected Stroke: Not Always Worth the Extra Mile

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AJNR Am J Neuroradiol 2020, 41 (11) E86-E87

doi: <https://doi.org/10.3174/ajnr.A6763>

<http://www.ajnr.org/content/41/11/E86>

This information is current as
of August 10, 2025.

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We read with interest the article by Kwee et al¹ entitled “CT Scanning in Suspected Stroke or Head Trauma: Is it Worth Going the Extra Mile and Including the Chest to Screen for COVID-19 Infection?” In this study, the authors retrospectively analyzed 27 patients with suspected stroke or head trauma who underwent head CT with routine addition of a chest CT in a coronavirus disease 2019 (COVID-19)-endemic region in the Netherlands. Most of these patients had suspected stroke, and 7 (26%) patients were positive on reverse transcriptase polymerase chain reaction (RT-PCR) for COVID-19. The authors appropriately concluded that suspicious chest CT findings needed to be interpreted with clinical history and confirmed by RT-PCR testing.

Although the article title implies that using chest CT to screen for COVID-19 in this patient population may add value, we believe that the routine addition of a chest CT for patients with suspected stroke undergoing neuroimaging may not be worth the extra mile because of the low potential diagnostic yield. We retrospectively investigated patients with acute stroke with large-vessel occlusions at our institution for COVID-19 status (study exempted by the institutional review board). From March 1, 2020, to April 30, 2020, at the Massachusetts General Hospital (Boston, Massachusetts), a comprehensive stroke center, a total of 34 admitted patients had large-vessel occlusions on neuroimaging. This time period includes the rise and peak of the COVID-19 pandemic in Massachusetts, with a cumulative total of nearly 67,000 COVID-19-positive cases reported during those 2 months,² greater than the number of cases in the Netherlands.³ In addition, our hospital saw the largest number of hospitalized patients with COVID-19 in Massachusetts.

Of the 34 patients with large-vessel occlusions, only 1 (3%) was positive for COVID-19 by RT-PCR. Of the remaining patients, 20 (59%) tested negative for COVID-19 by RT-PCR (average, 2.2 negative tests per patient) and 13 did not undergo testing. The patients who did not undergo testing were all patients

admitted in March without clinical findings suspicious for COVID-19. In April, our institution mandated COVID-19 testing for all hospitalized patients. Given the low prevalence of COVID-19 infection among these patients with stroke, the routine addition of chest CT at the time of neuroimaging would have had a low diagnostic yield in this cohort. These findings contrast with the study of Kwee et al,¹ in which 26% of patients with suspected stroke or head trauma were positive for COVID-19, suggesting a higher possible yield. A possible explanation for this difference is that although Kwee et al found that 20 of 27 patients (74%) had symptoms of possible COVID-19 infection (fever, cough, and/or dyspnea), we found that only 4 of 34 (12%) patients in our cohort had such symptoms at the time of hospital admission. This difference in symptom prevalence could be because our cohort included only patients with large-vessel occlusions, but Kwee et al included any patient with suspected stroke or head trauma.

Because the diagnostic yield appears to be associated with symptom prevalence, we advocate for the targeted use of chest CT informed by clinical history, as opposed to the routine addition of chest CT to all patients with suspected stroke undergoing neuroimaging. Given the low positive predictive value of chest CT for COVID-19 infection as reported by Kwee et al¹ (54.6%), the incidental detection of lung parenchymal findings could lead to additional infection control precautions, diagnostic testing, and personal protective equipment consumption. Nevertheless, in a multi-institutional study of 118 patients with stroke during the height of the COVID-19 pandemic in New York City (with greater COVID-19 case numbers than Massachusetts or the Netherlands³), 26% of patients were positive for COVID-19 by RT-PCR.⁴ Thus, it remains possible that a screening chest CT could be worthwhile in regions of very high disease prevalence.

We thank the authors for sharing their experience, which provides valuable data for how we can optimize imaging protocols during the COVID-19 pandemic.

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<http://dx.doi.org/10.3174/ajnr.A6763>

Disclosures: William Mehan Jr—UNRELATED: Consultancy: Kura Oncology, Comments: independent image reviewer for head and neck clinical trial; Expert

Testimony: CRICO and other medical insurance companies; expert opinion for medicolegal cases involving neuroimaging.

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