



Lung ultrasonography in COVID-19: a game changer in the stroke unit?

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Dear Editor,
Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) is rapidly spreading worldwide, and the World Health Organization declared its pandemic nature on 11 March 2020 [1]. The outbreak has hit Europe and, as of 19 April 2020, Italy has the third largest

number of confirmed cases, namely a total of 175 925 cases and 23 227 deaths according to the Johns Hopkins University [2]. This is the largest health and economic emergency of our country since the post-war period, and many hospitals are now dedicated exclusively to COVID-19 assistance. Our University Hub Stroke Unit of Cattinara Hospital is in the northeastern Italian region of Friuli Venezia Giulia which has registered 2731 cases and 222 deaths at the time of writing [3]. The health emergency has revolutionized the hospital logistics and, similarly to other parts of the country, a decrease in the number of stroke unit admissions has been experienced [4]. From 9 March 2020 to 12 April 2020 25 patients have been admitted with acute ischaemic or haemorrhagic stroke to our stroke unit. No patients were suspected for COVID-19 but, previous to admission in our unit, they all underwent nasopharyngeal swab in the emergency department, testing negative. During hospitalization, 16 patients with fever or dyspnoea or elevation in C-reactive protein/brain natriuretic peptide underwent lung ultrasound and one of them, at fever onset (day 4 of hospitalization), showed signs compatible with interstitial pneumonia (bilateral B-lines with irregular pleura). The nasopharyngeal swab was repeated on the latter patient, testing positive.

Lung ultrasound has a key role in the clinical management and diagnosis of patients with COVID-19 associated lung injury [5]. This technique is rapid, cost-effective and can be performed at the bedside. At the level of the stroke unit, it was decided to use lung ultrasonography in all suspected patients. Patients were studied with an eight-zone approach, considering each hemithorax divided into anterior (upper and lower) and lateral

(upper and lower) areas. For each area, a longitudinal and a cross-sectional view were obtained. A convex probe was used.

During the pandemic, to reduce the risk of SARS-CoV-2 spreading in non-COVID units (i.e. the stroke unit), a rapid evaluation of suspected patients is fundamental. Moreover, one of the most frequent stroke complications is the onset of bacterial pneumonia and lung ultrasound may help in the differential diagnosis. The aim of this letter is to highlight the importance of lung ultrasound and its use also in neurological departments.

Declaration of ethical standards and acknowledgements

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References

1. <https://www.who.int/docs/default-source/coronaviruse/transcripts/who-audio-emergencies-coronavirus-press-conference-full-and-final-11mar2020.pdf> (accessed 19/04/2020).
2. <https://coronavirus.jhu.edu/map.html> (accessed 19/04/2020).
3. www.salute.gov.it/imgs/C_17_notizie_4524_0_file.pdf%0D (accessed 19/04/2020).
4. Naccarato M, Scali I, Olivo S, *et al.* Has COVID-19 played an unexpected 'stroke' on the chain of survival? *J Neurol Sci.* 2020; **414**: 116889.
5. Smith MJ, Hayward SA, Innes SM, Miller A. Point-of-care lung ultrasound in patients with COVID-19 – a narrative review. *Anaesthesia* 2020; **75**: 1096–1104.