

## Editorial

DOI: 10.22114/ajem.v4i2s.457

**Point of Care Ultrasound as a Triage Tool in Novel Coronavirus. Is It Necessary or Not?**

Hooman Hossein-nejad\*

Department of Emergency Medicine, Faculty of Medicine, Tehran University of Medical Sciences, Tehran, Iran.

Email: hoseinnejad@tums.ac.ir

Published online: 2020-05-28

Overcrowding during pandemics, such as COVID-19 necessitates the separation of respiratory patients in different locations with special protective measures. Thus, we allocated space to such a purpose and named it "respiratory emergency" in our emergency department and started to triage the patients coming in with respiratory tract signs and symptoms apart from others. However, the most critical point for the triage of respiratory patients is differentiation between COVID-19 and non COVID-19 suspicious patients as well as decision-making in terms of self-quarantine and outpatient treatment or admission. Considering the lack of test kits and more importantly, the uncertainty revolving around the performance and efficacy of tests, we used computed tomography (CT) scan as a triage tool, yet our machines cannot scan all these patients because we had up to more than eight hundred patients per day. Meanwhile three of us - emergency attending physicians - were under the impression that lung ultrasound may help. Therefore, we started to use lung ultrasound in a limited fashion. Fortunately, typical cases had peripheral and sub-pleural lesions that could be seen by ultrasound. Parallel to these efforts, limited reports were published about the use of ultrasound for COVID-19 in other regions.

Evidently, a screen test is expected to have high sensitivity rather than specificity and the ultrasound provides this opportunity. Also we know the findings are not specific and for example we had observed these patterns in other viral epidemics, such as severe acute respiratory syndrome (SARS) or middle East Respiratory Syndrome (MERS). To date, several triage systems have been developed. The Italian version used by Dr. Volpicelli first and developed further by others, like that of Liam Devonport can exemplify this case (1, 2).

Furthermore, a simple triage system has been developed by Dr. Mike Stone, based on the ultrasound of lungs plus oxygen need (3). This flowchart summarizes Dr. Stone's idea with three

elements for decision-making consisting of: a) O2 requirement, b) B lines and c) consolidation. Three categories are enrolled. All patients with cough, fever and dyspnea or patients coming in from high-risk areas or those having close contact with covid-19 patients are enrolled. After bedside sampling for polymerase chain reaction (PCR) test, the O2 saturation is measured and lung ultrasound is also done and then according to the data obtained, four categories are created as follows:

- Inpatients for whom supplementary O2 is not required. If lung ultrasound shows A profile, patients can be discharged to home quarantine. If lung shows profile B, patients should undergo quarantine plus follow-up. This quarantine can be at home or institutes considering the facilities available.
- Patients, depending on supplementary oxygen, should be admitted according to the findings of lung ultrasound. If they have only B lines, they are admitted in the ward but if they have profile B plus consolidation, we should consider intensive care unit (ICU) beds for them.

In essence, all these systems use lung ultrasound for decision-making, which is efficient in a majority of occasions, yet we have critically ill patients with dyspnea and decreased O2 saturation without proportionate changes in lungs even according to CT scanning. Thus, we could not justify their health status based on the findings of the imaging of respiratory system.

To discover the cause of dyspnea in these patients, we included heart ultrasound in addition to lung ultrasound and witnessed a decline in ejection fraction and global hypokinesia, which can justify their unsatisfying health status. In the meantime, several case series about myocarditis in covid-19 reveal the prevalence of myocarditis between 7% and 20% among patients (4). Increased troponin and change of the electrocardiogram (ECG) in these patients confirm myocarditis and help us to calibrate our care for the heart complaints sooner and more effectively. This approach might provide better prognosis for these patients.

**Recommendation**

We suggest adding heart ultrasound to lung ultrasound in triaging the patients suspicious of COVID-19 or at least in the first doctor visit even if CT scan is available because myocarditis with pneumonia exists in some patients at the same time. Furthermore, we found that E-Point to Septal

Separation (EPSS), as a reliable indicator of global hypokinesia in heart, can be used effectively instead of evaluating through eyeballing because eyeballing needs a high level of expertise and may be more operator-dependent and obtaining a four-chamber view in supine critically ill patients is difficult when the operator lacks expertise.

**REFERENCES**

1. Davenport L. First Protocol on How to Use Lung Ultrasound to Triage COVID-19. April 09, 2020. [Available from: <https://www.medscape.com/viewarticle/928419>].
2. Volpicelli G, Gargani L. Sonographic signs and patterns of COVID-19 pneumonia. *Ultrasound J.* 2020;12(1):22.
3. Stone M. COVID-19 Lung Ultrasound Triage. [Available from: [https://assets.website-files.com/5a0cbe08f1138d000147a9d4/5e7263c656e99f4b26c9a75b\\_2020-03\\_COVID\\_treatment.pdf](https://assets.website-files.com/5a0cbe08f1138d000147a9d4/5e7263c656e99f4b26c9a75b_2020-03_COVID_treatment.pdf)].
4. BMJ Best Practice. Coronavirus disease 2019 (COVID-19). May 28, 2020 [Available from: <https://bestpractice.bmj.com/topics/en-gb/3000168/pdf/3000168/Coronavirus%20disease%202019%20%28COVID-19%29.pdf>]