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Prognostication of lung ultrasound compared with chest tomography among patients with SARS-CoV-2 in the Intensive Care Unit

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Introduction: The major cause of mortality in patients affected by COVID-19 disease is the development of acute respiratory distress syndrome (SARS-CoV-2) due to the intense inflammatory process that affects the lungs associated with thrombotic events in the microcirculation, promoting refractory hypoxemia and multiple dysfunctions of organs. The screening of suspected or confirmed patients is based on clinical, radiological and laboratory evaluation. Screening through pulmonary ultrasound^(1,2) and bedside echocardiography help in decision-making and the patient's prognosis.⁽³⁾

Objective: The aim of the study was to assess the correlation between Lung Ultrasonography Scores (LUS) and the percentage of ground glass assessed by chest computed tomography (CT).

Methods: An observational cohort study was carried out from 2020 to 2021 in the Intensive Care Unit at tertiary hospital 255 patients suspected and/or confirmed for a COVID-19 disease were included. After admission, an eight-area pulmonary ultrasonography was performed and a LUS was standardized, which ranges from 0 to 24 points, depending on the pulmonary artifacts associated with the echocardiogram exam.

Results: There was a statistically significant difference between patients with positive PCR-RT related to factors: diabetes mellitus, active smoking, obesity and chronic renal failure. Regarding the need for supplemental oxygen support, a difference was observed between the use of an oxygen catheter in the PCR-RT negative group. The data obtained in our sample showed a low sensitivity and high specificity for SARS-CoV-2 allowing to exclude COVID-19 in relation to differentiating it from other causes of pulmonary infections. The characteristics of pulmonary artifacts help in more assertive screening and treatment, analyze the time of onset and likely case severities and multimodal support. There is a correlation between LUS and CT Chest in patients with suspected SARS-CoV-2 in the intensive care unit and a discriminative of 0.9 area under curve related to increased length of stay and mortality in LUS >8 (Figure 1).

Conclusion: The use of this tool can be implemented in resource-limited settings for screening on clinical suspicion of viral pneumonia.

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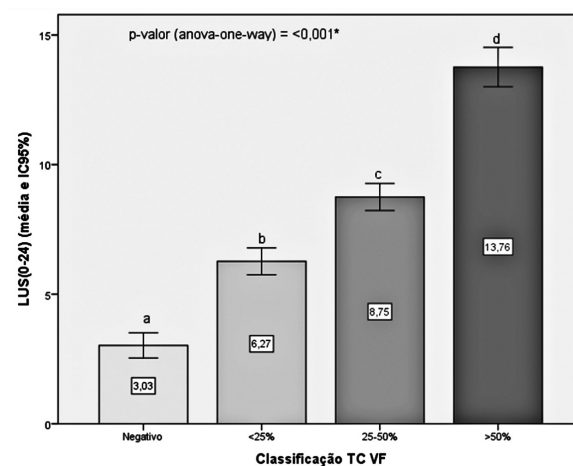


Figure 1. Cox regression for survival analysis related to Lung Ultrasound Score