

The Relationship Between Computed Tomography Parameters and Morbidity and Mortality in Patients Hospitalized with Coronavirus Disease 2019

Maciej Tysarowski, Giselle Suero Abreu, Barbara Danek, Boniface Malangu, Shawn Adam, Khyati Mehta, Aris Karatasakis, Anthony Lucev, Pallavi Solanki, Marc Klapholz, Julius Gardin, Alfonso Waller

Background

Patients with coronavirus disease 2019 (COVID-19) frequently experience symptoms from the involvement of the respiratory system. The disease severity ranges from asymptomatic to critical, requiring intubation and intensive care admission. Growing evidence is suggestive that cardiovascular system involvement in the pathophysiology of COVID-19 is not infrequent, however, there are limited studies evaluating the relationship between computed tomography (CT) parameters and patient morbidity and mortality.

Hypothesis

We hypothesized that right and left ventricular diameter, measured using CT, as well as right ventricle to left ventricle diameter ratio of more than 1, are associated with morbidity and mortality in patients with COVID19 infection, in addition to clinical and laboratory markers of severity of illness.

Methods

We queried the electronic medical records at University Hospital in Newark, NJ for consecutive patients who were admitted with a diagnosis of COVID-19 and underwent clinically indicated computed tomography of the chest between March 1, 2020 and February 28, 2021. Patients were eligible for inclusion if the diagnosis of COVID-19 disease was confirmed by a PCR test and an eligible imaging study was performed either after the PCR test or within the 14-day period prior to confirmation of the diagnosis. We constructed a dataset of 422 patients, which includes clinical, cardiac imaging, and outcome parameters variables. CT images were reviewed in cardiac reformatted views on a 3D workstation. The primary outcome of our study was defined as a composite of death, intubation, treatment with pressors, and in-hospital cardiac arrest.

Results and Conclusions

Cardiac re-formatted views of clinically indicated CT scans of the chest is feasible. Data collection is in progress, results will be presented once available.