

Title: Which Measure Of Right Ventricle Assessment Should Be Used In COVID-19 To Predict In-hospital Mortality?

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Introduction:

Right ventricle failure is one of the features of severe COVID19 which is associated with poor outcomes. Measurement of failing right ventricle (RV) is difficult, and the few measures that have been used to study RV include tricuspid annular plane systolic excursion (TAPSE), right ventricle systolic pressure (RVSP) and RV dilation. There is limited data with regards to which of these parameters should be used to predict mortality in COVID19.

Hypothesis:

Low TAPSE, high RVSP, and higher dilation are associated with higher in-hospital mortality.

Methods:

We performed a retrospective chart review of patient hospitalized with COVID-19 infection and underwent echocardiography (ECHO) within the Northeast Georgia Health System from March 2020 to December 2021. The primary outcome was in hospital mortality. RV dilation was classified as none, mild, moderate, and severe. TAPSE and RVSP were used as continuous variable in univariate analysis. We used multivariable cox regression model and adjusted for demographical characteristics and underlying co-morbidities, along with the three RV failure parameters. We used interaction terms between the parameters to identify which parameter correlated with mortality. For interaction, we classified TAPSE into 4 group - <1.2; 1.2 to 1.5; 1.5-1.8 and >1.8.

Results:

In total 7939 patients were identified with COVID-19 infection and of these, 3,109 underwent ECHO. Of these 56% were males and mean age was 65.6 years (SD 15.1 years). In hospital mortality was 25.9%. On univariate analysis, TAPSE (HR 0.71, 95%CI 0.61-0.84), RV dilation (HR 1.11, 95%CI 1.04-1.19) were strongly associated while RVSP (HR 1.01, 95%CI 1.00-1.01) was poorly associated with in-hospital mortality. On multivariable cox regression model with interaction, TAPSE < 1.2 along with moderate to severe RV dilation was associated with in hospital mortality (HR 1.88, 95%CI 1.25-2.8, p=0.002). Dilated RV was still associated with in-hospital mortality even when TAPSE was higher than 1.2 (HR 1.56, 95%CI 1.01-2.4, p=0.04).

Conclusions:

Moderate to severe Dilation of RV and TAPSE < 1.2 were strongly associated with an increase in mortality. Moderate to severe dilation of RV was also associated with increased mortality with TAPSE between 1.2 to 1.8.