Prognostic value of pre-hospitalization stress perfusion CMR to predict death in patients hospitalized for COVID-19

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BACKGROUND: Inducible ischemia is a strong marker of vascular vulnerability that may be a key pathogenetic determinant of COVID-19 severity.

PURPOSE: This study investigated the prognostic value of prior inducible ischemia on stress perfusion CMR to predict death in patients hospitalized for COVID-19.

METHODS: In an observational study, we retrospectively analyzed consecutive patients referred for stress perfusion CMR within last two years prior to hospitalization for COVID-19. The primary outcome was all-cause death, including in-hospital and post-hospitalisation deaths, based on the electronic national death registry.

RESULTS: Among the patients referred for stress perfusion CMR, 481 were hospitalized for COVID-19 (mean age =68.4 ± 9.6 years, 61.3% males) and completed the follow-up (median 73[36-101] days). There were 93 (19.3%) all-cause deaths, of which 13.7% were in-hospital and 5.6% post-hospitalisation deaths.

Using Kaplan-Meier analysis, age, male gender, hypertension, diabetes, known CAD, the presence of prior inducible ischemia, the number of ischemic segments, the presence of LGE, and LVEF were significantly associated with all-cause death. In multivariable stepwise Cox regression analysis, age (HR: 1.04; 95%CI:1.01-1.07, p = 0.023), hypertension (HR: 2.77; 95%CI:1.71-4.51, p < 0.001), diabetes (HR: 1.72; 95%CI:1.08-2.74, p = 0.022), known CAD (HR: 1.78; 95%CI:1.07-2.94, p = 0.025) and the presence of prior inducible ischaemia (HR: 2.05; 95%CI:1.27-3.33, p = 0.004) were independent predictors of all-cause death.

CONCLUSIONS: In COVID-19 patients, prior inducible myocardial ischemia by stress CMR over the last two years preceding the COVID-19 pandemic was independently associated with all-cause in-hospital and post-hospitalisation deaths, suggesting involvement of vasculature and endothelial dysfunction in the severity of COVID-19.

Abstract Figure. Death rates (%) according to ischemia
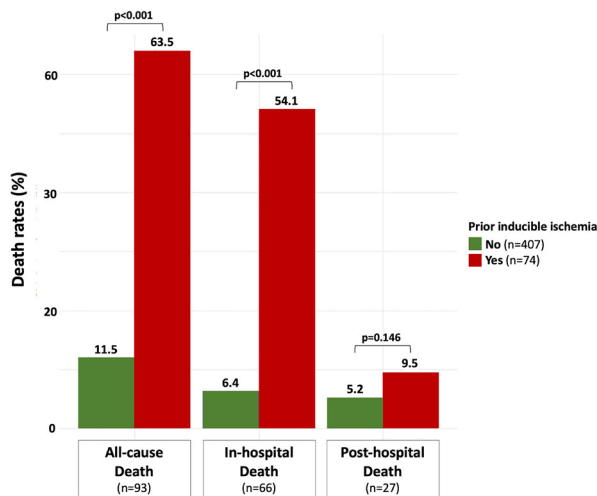
Abstract Figure. Survival curves for All-cause Death