

Undetected early heart damage raises risk of death in hospitalized COVID-19 patients

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Hospitalized COVID-19 patients with impaired first-phase ejection fraction were nearly 5 times more likely to die compared to patients with healthier measures of this early, often undetected sign of heart failure, according to new research published today in *Hypertension*, an American Heart Association journal. First-phase ejection fraction is a measure of the left ventricular ejection fraction until the time of maximal ventricular contraction.

Cardiovascular risk factors and/or disease have been recognized as COVID-19 risk factors that have a high negative impact on patient outcomes, since early in the SARS-CoV-2 pandemic. Researchers hypothesized that predisposition to [heart failure](#) would be associated with more severe cases of COVID-19 in hospitalized patients.

"Traditionally, [heart](#) function is measured by ejection fraction, or how much blood the left ventricle pumps out with each contraction of the heart," said study author Phil Chowienczyk, M.B.B.S., B.Sc., professor of cardiovascular clinical pharmacology at St. Thomas' Hospital, in London. "First-phase ejection fraction is a new

measure of the heart's function that seems to be much more sensitive of early, undetected damage to the heart than traditional ejection fraction measures."

To determine if first-phase ejection fraction predicted adverse [patient outcomes](#), researchers analyzed mortality rates for 129 hospitalized COVID-19 patients in Wuhan, China, and 251 hospitalized COVID-19 patients in South London, treated between February and May 2020, were analyzed. All patients had echocardiography upon hospital admission, and the average patient age was 58 years. Researchers compared echocardiography results of COVID-19 patients to adult patients with otherwise similar health profiles who had an echocardiography test before the pandemic.

First-phase ejection fraction was measured with conventional echocardiography imaging conducted at hospitalized patients' bedsides. Researchers note that there is not a universally established 'normal' value for first-phase ejection fraction. Based on previous research, they estimated that the normal first-phase ejection fraction value should be above 25%. When first-phase ejection fraction was less than 25%, researchers referred to it as 'impaired,' suggesting relatively subtle signs of heart damage.

The authors found that COVID-19 patients with a first-phase ejection fraction of less than 25% had a nearly five-fold higher risk of death than those with an ejection fraction of 25% or higher. They also found that a similar proportion of people with similar risk factors who did not have COVID-19 had low values of first-phase ejection fraction. This suggests that the damage to the heart may be due to chronic pre-existing conditions and was not the result of COVID-19 infection.

"Patients with impaired first-phase ejection fraction could be prioritized for vaccines and, if they get

COVID-19, monitored closely at the early stages of their illness to prevent deterioration," Chowienczyk said. "The findings suggest that if we can prevent the very early chronic damage to the heart detected using first-phase ejection fraction imaging, then people will be much more likely to survive respiratory infections like COVID-19. Healthy lifestyle choices, better treatments and adherence to treatments for [high blood pressure](#) and high cholesterol are also important."

Researchers note that this is a relatively small study, so the findings need to be confirmed in larger studies with more patients. If the results are confirmed, first-phase [ejection fraction](#) could be a new way to identify patients at elevated risk of dying from COVID-19 and possibly other types of pneumonia.

More information: *Hypertension* (2021).

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