

## International COVID-19 registry uncovers increased incidence of clotting in heart attack patients with COVID-19

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Central Illustration. Acute Myocardial Infarction Risk Model for In-Hospital Mortality: Risk Score and ValidationUsing data from the ACTION (Acute Coronary Treatment and Intervention Outcomes Network) Registry–GWTG (Get With the Guidelines) database, a multivariate hierarchical logistic regression model was developed to predict in-hospital mortality in patients presenting with acute myocardial infarction (AMI), with points assigned for each



value for each parameter (A). Observed in-hospital mortality rates for the validation cohort varied substantially by risk score (B), ranging from as low as 0.4% in the lowest risk group (score 59). CrCl = creatinine clearance; Pts = points; SBP = systolic blood pressure; STEMI = ST-segment elevation myocardial infarction. Credit: *Journal of the American College of Cardiology* (2016). DOI: 10.1016/j.jacc.2016.05.049

The latest analysis from The North American COVID-19 STEMI (NACMI) was presented today as late-breaking clinical research at the Society for Cardiovascular Angiography & Interventions (SCAI) 2023 Scientific Sessions. The findings show patients with an ST-elevated myocardial infarction, or STEMI, and COVID-19 had a significant amount of clotting in their arteries both before and after intervention. Importantly, clots were seen in multiple arteries in close to 30% of patients, a phenomenon observed in less than 5% of patients with heart attacks who do not have COVID-19.

In the United States, someone experiences a <u>heart attack</u> every 40 seconds (CDC). Of these patients, more than 25% will experience a more severe type of heart attack, an ST-elevated <u>myocardial infarction</u>, or STEMI caused by the sudden, total blockage of a coronary artery. Pre-COVID-19 mortality in STEMI patients was below 5%. Previous NACMI research has shown that mortality jumps to 20% to 25% in patients who present with COVID-19 and a heart attack.

In this blinded angiographic analysis, sites were invited to send angiograms to the Cardiovascular Imaging Research Core Lab (Vancouver, CA). Quantitative coronary angiography percent diameter stenosis (DS), thrombolysis in myocardial infarction (TIMI) flow, myocardial blush grade (MBG) and thrombus grade burden (TGB) were assessed. Percutaneous coronary intervention (PCI) was classified as



unsuccessful if there was residual DS>50% and/or 0 and DS > 50% in > 2 arteries, respectively.

Angiograms of 234 patients from 17 sites (12 US, 5 CAN) were analyzed. High TGB was observed in 74% of all patients preintervention and 29% of patients post intervention. A high proportion of patients (19%) did not have culprit lesions (locations inside the arteries readily identified by treating physicians) suggesting other mechanisms for heart attack maybe at play in this patient population. Core lab identified stent thrombosis (clotting of previously placed stents) in 12% of the entire cohort—a frequency that has never been observed in other STEMI cohorts. Of the 49 patients Core lab identified PCI failure rates were 34% which a high complication rate of 23%, mostly related to thrombus.

"COVID-19 is a pro-inflammatory, clot forming disease and we now see its effect in the coronary arteries," said Payam Dehghani, MD, FRCPC, FACC, FSCAI, Co-Director of Prairie Vascular Research Inc and Associate Professor at the University of Saskatchewan, Canada. "These new insights point to the need for clinicians to be meticulous with blood thinning strategies, early interventions and patient follow-up."

The NACMI registry is a collaboration between SCAI, the American College of Cardiology and the Canadian Association of Interventional Cardiology. The registry was established in 2020 with the aim to define baseline characteristics and management strategies and outcome data for COVID-19 patients presenting with STEMI. More than 60 medical centers across North America and Canada contributed data to the registry.

Researchers note that further investigation is needed to better understand the impact of COVID-19 and heart attacks related vaccination as well as long-term outcomes.



## Provided by Society for Cardiovascular Angiography and Interventions

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