

Comparison of thrombus burden in patients with COVID-19 presenting with ST-segment elevation myocardial infarction across the three waves of outbreak in the United Kingdom

Z. Teoh, K. Rathod, A. Tyrllis, F. Choudry, K. Comer, O. Guttman, A. Jain, A. Wragg, A. Archbold, A. Baumbach, A. Mathur, D. Jones

Barts Health Trust, London, United Kingdom

Funding Acknowledgement: Type of funding sources: None.

Background: It has been previously reported during the first COVID outbreak that patients presenting with ST-Segment Elevation Myocardial Infarction (STEMI) and concurrent COVID-19 infection have increased thrombus burden and poorer outcomes [1]. Subsequently, there have been multiple further waves of the pandemic with the emergence of at least two new COVID-19 variants and the emergence of vaccinations. To-date, there have been no reports comparing the outcomes of COVID-19-positive STEMI patients across all waves of the pandemic.

Purpose: The purpose of this study was to compare the baseline demographic, procedural and angiographic characteristics alongside the clinical outcomes of patients presenting with STEMI and concurrent COVID-19 infection across the COVID-19 pandemic in the UK.

Methods: This was a single-centre, observational study of 1250 consecutive patients admitted with confirmed STEMI treated with primary percutaneous coronary intervention (PCI) at Barts Heart Centre between 01/03/2020 and 10/03/2022. COVID +ve patients were split into 3 groups based upon the time course of the pandemic (Wave 1: March 2020-June 2020, Wave 2: Sept 2020-March 2021, Wave 3: October 2021-March 2022). Comparison was made between waves and with a control group of COVID-ve patients treated during the same timeframe.

Results: A total of 135 COVID +ive patients with STEMI (1st Wave: 39

patients, 2nd Wave: 60 patients, 3rd wave 35 pts) were included in the present analysis; and compared with 1115 COVID negative patients. Significant changes in the baseline characteristics, angiographic features and clinical outcomes of COVID +ive patients occurred over time. Early during the pandemic (Wave 1 2020), STEMI patients presenting with concurrent COVID-19 infection had high rates of cardiac arrest, evidence of increased thrombus burden (higher rates of multi-vessel thrombosis, stent thrombosis, higher modified thrombus grade higher use of GP IIb/IIIa inhibitors and thrombus aspiration, coagulability (more heparin for therapeutic ACT), bigger infarcts (lower myocardial blush grade and left ventricular function) and worse outcomes (mortality). However, by wave 3 (late 2021/2022), no differences existed in clinical characteristics, thrombus burden, infarct size or outcomes between COVID +ive patients and those without concurrent COVID-19 infection with significant differences compared to earlier COVID +ve patients. Poor outcomes later in the study period were predominantly in unvaccinated individuals.

Conclusions: Significant changes have occurred in the clinical characteristics, angiographic features and outcomes of STEMI patients with COVID-19 infection treated by primary PCI during the course of the pandemic. Importantly it appears that angiographic features and outcomes of recent waves are no different to a non-COVID-19 population.