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Major Adverse Cardiovascular Events (MACE) in COVID-19 Infection and the Role of Cardiac Biomarkers: A Systematic Literature Review

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Background: Coronavirus disease 2019 (COVID-19) was declared a global pandemic by the World Health Organization in March 2020 [1]. The impact of coronavirus infections on the cardiovascular system has been previously documented during the outbreaks of Middle East Respiratory Syndrome and Severe Acute Respiratory Syndrome [2]. Several diverse cardiac manifestations of COVID-19 have been identified [3-5]. This rapid systematic review aimed to examine the role of cardiac biomarkers in predicting cardiac disease in coronavirus infection and investigate whether the magnitude of raised cardiac biomarkers can be used to predict more severe disease outcomes.

Methods: A systematic literature review was performed according to PRISMA principles to identify relevant published studies between January 2000 to June 2020. Additionally, we searched Google Scholar for grey literature.

Results: The initial search identified 3,665 publications of which 3,515 were excluded. In the 150 included studies, results from 33,805 patients (44.9% female) were included, amongst which there were 3,553 deaths (mortality rate 10.51%). Patients with pre-existing conditions, including hypertension (n=7,425) and diabetes (n=4,980), were more likely to have increased troponin, and were at higher risk of experiencing adverse outcomes, including death.

Conclusions: Patients with COVID-19 are at risk of adverse cardiovascular outcomes. This risk is further enhanced in the presence of pre-existing cardiovascular comorbidities. Additionally, cardiac biomarkers may have a role in predicting adverse outcomes, including death, in this population.

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https://doi.org/10.1016/j.hlc.2021.06.304

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Management and Outcomes of STEMI in a Regional Non-24/7 Cardiac Catheterisation Lab

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Background: Numerous challenges are associated with the management of STEMI in regional Australia due to geographical distance prolonging transfers and lack of 24/7 cardiac services. We investigated the management and outcomes of STEMI patients presenting to Port Macquarie Base Hospital (PMBH) which operates a non-24/7 cath lab service.

Methods: A retrospective analysis was conducted on out-of-hospital STEMIs in 2018-19. Late presenting and aborted STEMIs were excluded.

Results: 90 patients had STEMIs meeting inclusion criteria. 60% (n=54) underwent primary PCI and 40% (n=36) were thrombolysed. Of thrombolysed patients, 28% (n=10) received pre-hospital thrombolysis. 42% (n=38) of STEMIs presented when the lab was open, 34% (n=31) when on-call and 23% (n=21) while closed. The rates of thrombolysis increased from when the lab was open (11%), on-call (42%) to closed (91%) ($p<0.0001$). 85% (n=73) of STEMIs presented to PMBH, while 18% (n=17) were transferred from peripheral hospitals. There were higher rates of thrombolysis at peripheral hospitals (59% vs. 36%, P = 0.08). Door-to-needle time (thrombolysis) was shorter than door-to-balloon time (primary PCI) (medians 46min vs. 102min, p=0.0006). Door-to-balloon time was significantly longer in peripheral hospital transfers (medians 98min vs. 178min, p=0.037). Door-to-lab-arrival time was significantly longer during on-call vs. open hours (medians 72min vs. 39min, p=0.027). There was no significant difference in major adverse cardiac events at 12 months between primary PCI and thrombolysis (9.3% vs. 14.3%, p=0.29).