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Mechanical circulatory support in refractory cardiogenic shock due to influenza virus-related myocarditis

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Combined mechanical circulatory support in refractory cardiogenic shock (ECMELLA) might not salvage patients with influenza-associated myocarditis and severe end-organ damage, in contrast to the favourable effects in primary cardiac causes <https://bit.ly/3dmonC4>

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ABSTRACT

Background: There is scarce evidence for mechanical circulatory support (MCS) in patients with influenza-related myocarditis complicated by refractory cardiogenic shock (rCS). We sought to investigate the impact of MCS using combined veno-arterial extracorporeal membrane oxygenation (VA-ECMO) and micro-axial flow pumps (the ECMELLA concept) in influenza-related myocarditis complicated by rCS.

Methods: This is a prospective, observational analysis from the single centre HAnnover Cardiac Unloading REgistry (HACURE) from two recent epidemic influenza seasons. We analysed patients with verified influenza-associated myocarditis complicated by rCS who were admitted to our intensive care unit (ICU) on MCS. Subsequently, we performed a propensity score (PS) matched analysis to patients with acute myocardial infarction (AMI) complicated by rCS and non-ischaemic cardiomyopathy (DCM) related rCS.

Results: We describe a series of seven patients with rCS-complicated influenza-related myocarditis (mean age 56 ± 10 years, 58% male, influenza A (n=2)/influenza B (n=5)). No patient had been vaccinated prior to the influenza season. MCS was provided using combined VA-ECMO and Impella micro-axial flow pump. In two patients with out-of-hospital cardiac arrest, VA-ECMO had been implanted for extracorporeal cardiopulmonary resuscitation. All patients died within 18 days of hospital admission. By PS-based comparison to patients with AMI- or DCM-related rCS and combined MCS, 30-day mortality was significantly higher in influenza-related rCS.

Conclusion: Despite initial stabilisation with combined MCS in patients with rCS-complicated influenza-related myocarditis, the detrimental course of shock could not be stopped and all patients died. Influenza virus infection potentially critically affects other organs besides the heart, leading to irreversible end-organ damage that MCS cannot compensate for and, therefore, results in a devastating outcome.