

Routine application of defibrillation pads and time to first shock in prehospital STEMI complicated by cardiac arrest

Introduction: ST-segment elevation myocardial infarction (STEMI) remains a significant cause of morbidity and mortality in North America, with recent studies suggesting that between 4 to 11% of patients diagnosed with STEMI suffer an out-of-hospital-cardiac arrest (OHCA). Previously published research has shown that shorter time to initial defibrillation in patients with VF/VT OHCA increases functional survival. The purpose of this study is to assess whether the routine application of defibrillation pads in STEMI decreases the time to initial defibrillation in those who suffer OHCA.

Methods: Ambulance call records (ACR) for patients diagnosed with STEMI in the prehospital setting from Jan 1, 2012 to Jun 30, 2016 were reviewed. Patients were included in the study if they were 18 years of age or older with a confirmed diagnosis of STEMI and suffered an OHCA with an initial shockable rhythm (VF or VT) while in paramedic care. The pre-pad protocol (routine application of defibrillation pads in STEMI patients) was implemented in July 2014. If inclusion criteria were met, ACRs were reviewed to determine whether the pre-pad protocol was implemented and to extract the time to initial defibrillation and relevant demographic and event features. Associated hospital charts were reviewed to evaluate inpatient event features and survival. T-test was used to assess the difference between mean times to defibrillation.

Results: **446** patients were diagnosed with prehospital STEMI. Of those, 11 patients experienced a paramedic-witnessed cardiac arrest. Four of the 11 had defibrillation pads applied upon diagnosis of STEMI. In patients who received pre-pad application, the mean time to initial defibrillation was 17.71 sec, compared to 72.71 sec in patients who had pads applied following arrest (MD 54.97 sec CI 22.69 to 87.24 sec). All patients treated with the pre-pad protocol survived to discharge from hospital, while one patient in the routine care group died in the ED.

Conclusion: Routine application of defibrillation pads decreases the time to initial defibrillation in STEMI patients who suffer OHCA. Larger studies are required to evaluate whether this decreased time to defibrillation translates into mortality benefit in this subset of patients who experience OHCA.