Use of mechanical chest compression devices in cardiac arrest: a single centre, observational, prospective study

Authors:
N Gasparetto¹, D Betta², A Daniotti¹, A De Leo¹, A Forti³, S Orazio⁴, G Zilio⁴, L Favero¹, F Marson⁴, S Giacomelli¹, V Salandin⁴, G Minniti¹, C Cernetti¹, ¹Hospital Santa Maria di Ca Foncello, Neuro-Cardiovascular - Treviso - Italy, ²University of Verona - Verona - Italy, ³San Martino Hospital, HEMS - Belluno - Italy, ⁴Hospital Santa Maria di Ca Foncello, Anesthesia, Resuscitation and Intensive Care - Treviso - Italy,

Topic(s):
Acute Cardiac Care – Resuscitation

Citation:
Aim of the study: to analyse the feasibility and outcome of cardiac arrest (CA) patients moved to the hospital for primary angioplasty during cardiopulmonary resuscitation (CPR) with mechanical chest compression device (LUCAS).

Materials and methods: from 2009 in Treviso Hospital (Italy) all consecutive patients younger than 70 years old with witnesses CA due to shockable or non shockable rhythms treated with bystander CPR and refractory to standard advance manoeuvre, were transport to our cath lab during chest compression with LUCAS.

Results: a total of 269 patients were included in CA registry with in-hospital CA (12%) or out-of-hospital CA (88%) with mean age of 55±13 years, due to a cardiac origin: in 73% the cause of CA was ST elevation myocardial infarction. Out of 46 patients (17%) it was necessary to use LUCAS to securely transport the patient to the hospital (in 95% directly in cath lab). In 52.2% coronary angiography was started after return of spontaneous circulation while in the remaining cases it was performed during chest compression with LUCAS. In 34% of the LUCAS group an ECMO was implanted. Survival at discharge from intensive care was 36% (77.7% with good neurological outcome) (LUCAS group) vs 67.7% (non-LUCAS group). Early predictor factors of survival for LUCAS group were ROSC before coronary angiography (during transport or after admission) (p=0.012) and arterial pH more than 6.9 at admission (p=0.029).

Conclusions: mechanical chest compression device may be useful to help advance CPR and, when a shared protocol is present in the hospital, a scoop and run strategy is feasible, to move the patients directly in cath lab for primary angioplasty. Out data suggest that major predictors of survival are pH and ROSC before coronary angiography.