

# Inotropes and vasopressors use in patients admitted in ICU with cardiogenic shock: a retrospective study

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## Background

Indications regarding use of inotropes and vasopressors use in cardiogenic shock (CS) are characterized by level of recommendation IIb and level of evidence C. Many studies aimed to define the standard of care in the use of these agents in CS.

## Aim

To describe the use of vasopressors and inotropes in patients with CS admitted in Intensive Care Unit (ICU) and to investigate their correlations with in-hospital mortality and mechanical circulatory support (MCS).

## Methods

Monocentric retrospective observational study considering patients with CS admitted in ICU from September 2017 to March 2021; patients with prior cardiac arrest were excluded. .

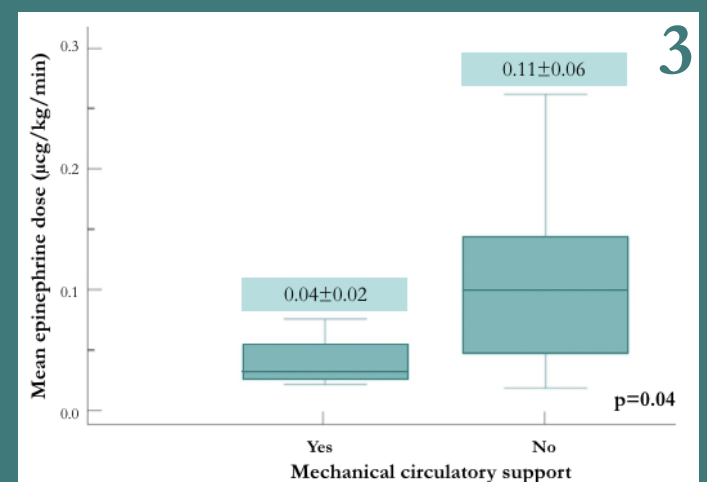
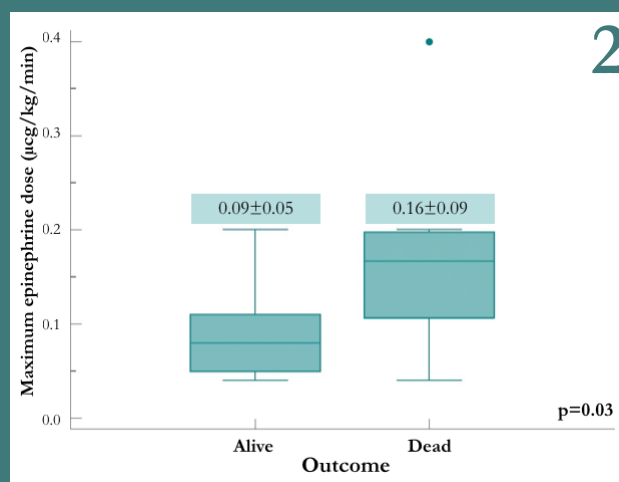
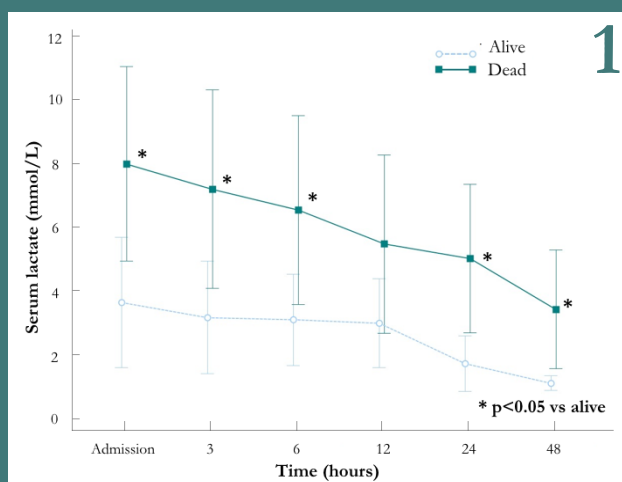
## Results

41 patients were enrolled ( $71.4 \pm 10.7$  years; 34.1% female) with CS at stage C or D (5); 53.6% died in hospital. 31.7% developed acute kidney injury and were treated with RRT, 73.2% of them were mechanically ventilated; 21.9% received MCS. Serum lactate at admission, after 3, 6, 24 and 48 hours were significantly high in patients who died (figure 1).

Maximum dose of epinephrine resulted significantly different between dead and dismissed alive patients (figure 2). However, doses administered were lower than those described in previous cited studies; furthermore, logistic regression showed no correlation between epinephrine administration and in-hospital mortality. No correlation was found between inotropes and vasopressors doses and RRT and days free from RRT, MV and days free from MV. In patients who received MCS mean dose of epinephrine was significantly lower than in patients who didn't (figure 3); no correlation was found between inotropes and vasopressors and MCS and days free from MCS.

## Conclusions

This work reports a greater exposition to epinephrine with higher maximum dose in dead patients; however, doses here reported are lower than those described in literature. Furthermore, in-hospital mortality, RRT, MV and MCS seem to be independent of epinephrine administration and all other catecholaminergic drugs used. In died patients, higher maximum epinephrine doses and lactate levels in died patients could be related to more severe clinical status at admission in ICU for CS, rather than be themselves cause of clinical worsening. Finally, when indicated, use of MCS could be useful in reducing epinephrine doses.



- McDonagh TA et al. 2021 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure. Eur Heart J 42.36 (2021): 3599-3726.
- De Backer D et al. Comparison of dopamine and norepinephrine in the treatment of shock. N Engl J Med 362.9 (2010): 779-789.
- Tarvasmäki T et al. Current real-life use of vasopressors and inotropes in cardiogenic shock-adrenaline use is associated with excess organ injury and mortality. Crit Care 20.1 (2016): 1-11.
- Levy B et al. Epinephrine versus norepinephrine for cardiogenic shock after acute myocardial infarction. J Am Coll Cardiol 72.2 (2018): 173-182.
- Baran DA et al. SCAI clinical expert consensus statement on the classification of cardiogenic shock. Catheter Cardiovasc Interv 94.1 (2019): 29-37.