

Authors' response

We thank Dr Champion [1] for his comments, especially because they gave up the opportunity to underscore some aspects which should be taken into account when managing patients with ST elevation myocardial infarction (STEMI) who require mechanical ventilation (MV).

The aim of our investigation was, as stated in the manuscript, to assess the clinical and prognostic impact of MV at short and long term mortality in consecutive unselected STEMI patients. The purpose to specifically address the clinical implications of MV in cardiogenic shock, though very interesting, does not belong to our study design [2].

In our center, in previous studies performed in cardiogenic shock (CS) following STEMI, MV was performed in a subset of patients with CS, that is in 42.9% [3] and 32.9% [4], respectively.

Indeed, a clinical diagnosis of CS was made on the condition that all the following criteria were present: (1) systolic blood pressure persistently lower than 90 mm Hg or vasopressors required to maintain systolic blood pressure higher than 90 mm Hg; (2) signs of hypoperfusion (e.g. urine output less than 30 mL/h or cold/diaphoretic extremities or altered mental status); and (3) clinical evidence of elevated left ventricular filling pressure (e.g. pulmonary congestion on physical examination or chest X-ray) [5, 6]. MV can therefore be required in a subset of CS patients (not in all).

In regard to MV in CS, we believe that MV itself is a therapy (not simply a support) and, like any other treatment, it should be implemented only when necessary and its efficacy depends also on the ability of physicians to use it. Generally, cardiologists are not often familiar with MV and are afraid of all the complications related to MV (i.e.

ventilator-associated pneumonia), also because they are not used to prevent them.

However, the limited available clinical data on MV in CS suggest that a moderate level of positive end expiratory pressure is safe to use in severe left ventricular dysfunction and CS, and may provide hemodynamic benefits as well in left ventricular failure which exhibits afterload-sensitive physiology [7].

We agree with Dr Champion that investigating the clinical impact (as well as the modalities) of MV in those patients with CS who require it deserves a clinical study specifically addressing this topic and possibly performed by well experienced cardiologists.

Conflict of interest: none declared

References

1. Champion S. The double-edged sword of mechanical ventilation for patients with cardiogenic shock. *Cardiol J*, 2014; 21: 449.
2. Lazzeri C, Valente S, Chiostrì M, Attanà P, Mattesini A, Gensini GF. Mechanical ventilation in the early phase of ST elevation myocardial infarction treated with mechanical revascularization. *Cardiol J*, 2013; 20: 612–617.
3. Attanà P, Lazzeri C, Chiostrì M, Picariello C, Gensini GF, Valente S. Strong-ion gap approach in patients with cardiogenic shock following ST-elevation myocardial infarction. *Acute Card Care*, 2013; 15: 58–62.
4. Attanà P, Lazzeri C, Chiostrì M, Picariello C, Gensini GF, Valente S. Lactate clearance in cardiogenic shock following ST elevation myocardial infarction: A pilot study. *Acute Card Care*, 2012; 14: 20–26.
5. Hochman JS. Cardiogenic shock complicating acute myocardial infarction: Expanding the paradigm. *Circulation*, 2003; 107: 2998–3002.
6. Holmes DR Jr. Cardiogenic shock: A lethal complication of acute myocardial infarction. *Rev Cardiovasc Med*, 2003; 4: 131–135.
7. Wiesen J, Ornstein M, Tonelli AR, Menon V, Ashton RW. State of the evidence: Mechanical ventilation with PEEP in patients with cardiogenic shock. *Heart*, 2013; 99: 1812–1817.

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