

Epinephrine infusion during venoarterial extracorporeal membrane oxygenation support for cardiogenic shock: simply inefficient or deleterious?

We read with great interest the original research article by Massart *et al.* reporting the adverse outcomes of patients treated with epinephrine during venoarterial extracorporeal membrane oxygenation (VA-ECMO) support for refractory cardiogenic shock.¹ The authors reviewed a large single-centre cohort including 589 patients supported with VA-ECMO. They observed that epinephrine administration was associated with an increased risk of mortality within 30 days of ECMO implantation. These findings were confirmed by propensity score matching considering baseline characteristics independent of epinephrine use.

The indication and timing for epinephrine initiation are not detailed by the authors. Similarly, the approach to manage left ventricular distension during VA-ECMO support is not described. Inotropic agents are usually the primary approach to prevent pulmonary congestion, a major concern in these patients.² However, it has never been demonstrated to be more efficient than interventional strategies in this indication. The authors hypothesize that the negative impact of epinephrine exposure in the study population could be first explained by an increase in myocardial work and oxygen demand. The same statement can be done with dobutamine. The non-physiological condition of the assisted circulation during VA-ECMO support is also known to increase myocardial wall stress, a condition that may promote myocardial injury. In this setting, efficient left ventricular unloading is a major determinant of cardiac recovery.³ Consistent with the results reported by Massart *et al.*, dobutamine should be preferred to epinephrine to maintain residual left ventricular

ejection in the setting of VA-ECMO for cardiogenic shock. Did the authors observe a lower rate of successful ECMO weaning in patients exposed to epinephrine? In our experience, we try to initiate inotropic agents only at the time of VA-ECMO weaning. What was the weaning protocol used by the authors in the present study?

Massart *et al.* have to be acknowledged for reporting a major issue in patients treated with temporary mechanical circulatory support for refractory cardiogenic shock. These findings underscore the need for further investigations on the optimal use of inotropic agents with the assisted circulation. We do believe that epinephrine should not be prohibited in patients under VA-ECMO since there is not enough evidence to consider this inotropic agent inefficient or deleterious in this indication.

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