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Short-term assist devices in postcardiotomy cardiogenic shock

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We congratulate Wang and colleagues for their study and very successful results [1]. Although the used short-term circulatory support system was venoarterial extracorporeal membrane oxygenation (VA-ECMO), the weaning rate reported by Wang et al., 64%, is quite high. Especially in postcardiotomy cardiogenic shock, whether or not cardiopulmonary bypass is used, frequently emerging situation is left ventricular dysfunction. Naturally, it is actually a short-term left ventricular support system (LVAD) that should be used for recovery of left ventricular functions. However, VA-ECMO is often preferred because of the ease of percutaneous placement in daily surgical practice, as in the study of Wang et al. But in our opinion, this is not a foolproof practice. Because VA-ECMO does not vent the left ventricle, so it cannot be expected to recover the post-cardiotomy left ventricle dysfunction. In particular, VA-ECMO, which is placed through the femoral artery, increases the afterload, makes the ventricle recovery even more difficult. If Wang and colleagues had used a real short-term LVAD (such as the Levitronix CentriMag) in all these patients, could weaning results have been much better? Another issue we wondered is the effect of ECMO duration on weaning or mortality rates. Because in some studies, as the duration of ECMO increases, weaning and survival rates increase [2] whereas in some other studies, an opposite result is mentioned [3]. In the study of Wang et al., patients who underwent ECMO less than 3 days had less mortality compared to those who underwent ECMO for 3–6 days. What are the comments of the authors on this subject by considering their own results?

Authors' response

Liangshan Wang, Feng Yang, Hong Wang and Xiaotong Hou

We are grateful to Iner et al. for their interesting and valuable comments on our paper.

Peripheral venoarterial extracorporeal membrane oxygenation (VA-ECMO) increases the left ventricle (LV) afterload, and LV overload increases wall stress and myocardial oxygen consumption, jeopardising LV recovery in postcardiotomy cardiogenic shock patients [4]. In our study, more than 80% of patients received VA-ECMO combined intra-aortic balloon pump, which might reduce LV afterload and increase coronary blood flow. Since left ventricular assist devices were not registered in China, no patients underwent ventricular assist device after VA-ECMO. The usefulness of VA-ECMO for these patients might have therefore been underestimated. As for the effect of ECMO duration on weaning or mortality rates, patients who underwent ECMO for 3–6 days had significantly lower mortality than those who used ECMO for < 3 days, which was similar with the results of the extracorporeal Life Support Organization (ELSO) registry [5]. Most of the patients who used ECMO for < 3 days could not be weaned from ECMO, which might account for our findings. The reasons for discontinuation in the early period included haemorrhage, organ failure and family request. Our study did not suggest that weaning should occur on a particular day in order to maximise survival. The duration of VA-ECMO depends on the underlying disease process.

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Authors' contributions
HI, NKY, and OG interpreted the results of the study. GG, AG, and LY made a literature review. All authors read and approved the final manuscript.

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Not applicable.

Consent for publication
Not applicable.

Competing interests
The authors declare that they have no competing interests.

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