

Response to Letter Regarding Article, “Assisted Beating of the Ischemic Heart: How to Manage the Pulseless ST-Segment– Elevation Myocardial Infarction Patient”

We thank Drs Reddy and Leeser for their interest in our article¹ and their informative letter on the complementary use of venoarterial extracorporeal membrane oxygenation (vaECMO) and intra-aortic balloon counterpulsation (IABP). In clinical practice, IABP is frequently used as the primary method of mechanical support for patients experiencing a myocardial infarction and cardiogenic shock. This choice is often based on years of experience with the device, whereas extracorporeal support is added only if IABP support does not suffice. Recent studies suggest that the concomitant use of IABP and vaECMO can actually be useful²; however, the pathophysiological changes are complex. The success of this interaction may very much depend on the generation of antegrade flow by the native heart, as well as its ability to open the aortic valve. If upper-body oxygenation can be warranted only via retrograde vaECMO flow and the opening of the aortic valve is not impaired, IABP may actually worsen cerebral and coronary perfusion.^{3,4}

In cases in which the native heart is unable to open the aortic valve, cardiac afterload reduction is of paramount importance. This situation is frequently encountered during extracorporeal cardiopulmonary resuscitation as a function of retrograde vaECMO flow leading to increased cardiac afterload. Ideally, vaECMO blood flow should be set to a level high enough to secure perfusion of the brain and coronary arteries while still allowing opening of the aortic valve. However, optimal ECMO blood flows and the targeted mean arterial pressure remain unclear. In this regard, continuous monitoring of cerebral tissue oxygenation might be useful.

The adjunct use of IABP may help to lower cardiac afterload and act as a relatively low-risk left ventricular decompression procedure during extracorporeal cardiopulmonary resuscitation. However, we believe that additional data are required before recommending IABP as the first-line left ventricular venting device. We would actually use an Impella pump as far as the clinical situation permits, considering that it has been shown to reduce major adverse cardiac and cerebral events compared with IABP during high-risk percutaneous coronary intervention.⁵ Nevertheless, we agree with Drs Reddy and Leeser that placement of a microaxial pump is nearly impossible at the bedside during chest compressions. Current evidence further supports the use of IABP concomitant with vaECMO therapy on an individual risk-to-benefit analysis, all in all making it a valuable option during extracorporeal cardiopulmonary resuscitation outside the catheterization laboratory.

None.

Disclosures

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