we read with great interest the study by Marcondi et al,[1] which evaluated the acute effects of NIV on central-venous oxygen saturation ($S_{\bar{c}vO_2}$) and blood lactate in subjects with left ventricular dysfunction during the early postoperative phase of coronary artery bypass graft surgery.[1] The authors found that NIV acutely improved $S_{\bar{c}vO_2}$ and decreased lactatemia, two known determinants of survival.[2] The authors are to be commended for their pioneering approach, nevertheless a few key aspects require comment to strengthen the message of the paper.

The timing of NIV implementation (ie, early after extubation) and the short duration of the application (ie, 1 h) raise clinical and physiological concerns. Similarly, there was no mention of the intra-operative course, data from hemodynamic monitoring, or concomitant medical or invasive therapy (eg, inotropic drugs, intra-aortic balloon pumping). Without these data, the interpretation of mere biochemical markers might be misleading.[3] Moreover, the study sample is ample but poorly characterized, and stratification according to surgical technique might introduce further bias. Indeed, according to institutional practice, an on-pump technique might be a surrogate marker of more demanding revascularization, lower hemodynamic stability, less atherosclerotic burden, or surgeon expertise. A new target population has been clearly identified, but the inherent merits of NIV require further investigation.

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REFERENCES

1. Marcondi NO, Rocco IS, Bolzan DW, Pauletti HO, Begot I, Anjos NR, et al. Noninvasive ventilation after coronary artery bypass grafting in subjects with left-ventricular dysfunction. Respir Care 2018;63(7):879-885.
2. Laine GA, Hu BY, Wang S, Thomas Solis R, Reul GJ Jr. Isolated high lactate or low central venous oxygen saturation after cardiac surgery and association with outcome. J Cardiothorac Vasc Anesth 2013;27(6):1271-1276.
3. O'Connor E, Fraser JF. The interpretation of perioperative lactate abnormalities in patients undergoing cardiac surgery. Anaesth Intensive Care 2012;40(4):598-603.

In Reply:

We are grateful for the thoughtful comments from the authors about the findings of our report.[1] Certainly, the well-balanced comments express the experience of this group related to the postoperative care of patients who underwent coronary artery bypass graft surgery.

Very few studies have addressed the correlation between tissue perfusion markers and the use of noninvasive ventilation (NIV). Despite the concerns surrounding the timing of NIV application and the short duration, data from our forthcoming studies have strengthen the findings now reported.[2] Regarding the intra-operative course, none of our subjects had mechanical circulatory support with an intra-aortic balloon pump, which is not part of our routine operative strategy. The stratification by technique, either on-pump or off-pump, has already been clarified in our report, where allocation to the technique was based on the surgeon's expertise and not on the severity and extension of the coronary disease.[3]

Ongoing work from our group will provide new information about the impact of the surgical procedure on the emergent and increasingly high-risk population of patients referred for coronary artery bypass surgery, especially those with COPD[4] and left ventricular dysfunction, where current information is worryingly scarce. It is therefore important to emphasize the potential role of NIV as an additional strategy for improving the postoperative care of these high-risk patients, allowing early and safe mobilization after coronary artery bypass graft surgery.

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REFERENCES

1. Marcondi NO, Rocco IS, Bolzan DW, Pauletti HO, Begot I, Anjos NR, et al. Noninvasive ventilation after coronary artery bypass grafting in subjects with left-ventricular dysfunction. Respir Care 2018; 63(7):879-885.
2. Nasrala MLS, Bolzan DW, Lage YG, Prado FS, Arena R, Lima PRL, et al. Extended-time of noninvasive positive pressure ventilation improves tissue perfusion after coronary artery bypass surgery: a randomized clinical trial. Braz J Cardiovasc Surg 2018; 33(3):250-257.
3. Sousa-Uva M, Neumann FJ, Ahlsson A, Alfonso F, Banning AP, Benedetto U, et al. 2018 ESC/EACTS Guidelines on myocardial revascularization. Eur J Cardiothorac Surg 2018 [Epub ahead of print] doi: 10.1093/ejcts/ezy289.
4. Viceconte M, Rocco IS, Pauletti HO, Vidotto M, Arena R, Gomes WJ, et al. Chronic obstructive pulmonary disease severity influences outcomes after off-pump coronary artery bypass. J Thorac Cardiovasc Surg 2018;156(4):1554-1561.