Microcirculation as a guide for therapy: do not condemn an innocent without a fair trial

CORRESPONDENCE

Microcirculation as a guide for therapy: do not condemn an innocent without a fair trial

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We read with interest the article by Bruno et al. [1] in a recent issue of Intensive Care Medicine. We wish to congratulate the authors for performing this study, which is the largest randomized-controlled trial investigating the impact of integrating microcirculatory monitoring in the management of patients with shock. Disappointingly, this study showed no reduction in 30-day mortality. However, several considerations need to be taken into account for a proper interpretation of the results.

First, microvascular monitoring could improve survival only if associated with an effective treatment targeting tissue perfusion. In this study, a treatment protocol with a clear strategy for microvascular resuscitation in the different types of shock was missing. Recommendations were made on fluid and vasopressor dosing according to the microcirculation. However, physicians were free to deviate from the protocol. Indeed, a mismatch between the announced and performed treatment changes was found in 41 out of 69 patients in the interventional group (59.4%) [1]. The reason for not including inotropes/vasodilators is also unclear since >50% of the inclusions were patients with cardiogenic shock [2].

Second, the use of 30-day mortality as the primary outcome appears inappropriate as it may be biased by several confounders. Changes in organ function or parameters of tissue oxygenation/perfusion would be more adequate.

In fact, microvascular parameters were similar after 24 h in the two study arms: this is in line with the lack of difference in survival. Moreover, life-sustaining therapy was limited in almost half of the patients on day two [1]: this raises questions about the appropriateness of the patient selection criteria. In addition, the use of 19% difference in mortality for sample size calculation appears to be arbitrary and represents an overestimation of the expected effect. Third, the inclusion of different types of

shock is questionable. Microcirculatory impairment has different triggers: pump failure in cardiogenic shock and myocardial stunning after cardiac surgery, vasoplegia, and microcirculatory shunting in septic shock or after cardio-pulmonary bypass. The microvascular response to treatments, such as fluids or vasopressors, may be different as well [3]. Fourth, video quality was unacceptable in 28% of videos. This is not a negligible percentage, and low-quality videos may produce spurious microcirculatory data [4]. Video-quality was assessed a posteriori. For a reliable microcirculatory assessment, low-quality videos should be excluded from the analysis [5], especially if using an automated software that cannot distinguish pressure artifacts from real flow alterations. Importantly, the AVA 4.3C software has not been validated against manual offline analysis. Therefore, the reliability of the microcirculatory data collected remains uncertain. In conclusion, we agree with the authors when they say: "[…] the results are probably more a sign for the failure of the selected interventions than the failure of microcirculatory monitoring". This study sheds light on the fact that we lack well-established effective treatment algorithms for the optimization of microvascular perfusion. Future efforts should be directed to identify effective resuscitation protocols based on the integration of microcirculatory monitoring with the standard hemodynamic parameters.

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