CRITICAL CARE

LETTER

Early norepinephrine resuscitation of life-threatening hypotensive septic shock: it can do the job, but at what cost?

Eric Kipnis* and Benoit Vallet*

See related research by Hamzaoui *et al.*, http://ccforum.com/content/14/4/R142

Hamzaoui and colleagues [1] recently reported the effects of early norepinephrine for septic shock with life-threatening hypotension. Their observations first answer 'yes' to the question 'Can norepinephrine alone restore mean arterial pressure (MAP) in septic shock?' Second, as an answer to 'How does norepinephrine alone restore MAP?', they confirm that norepinephrine restores MAP despite minimal fluid administration through 'recruiting' unstressed volume while allowing increased contractility despite increasing afterload. The most critical question that remains unanswered, however, is 'Should norepinephrine alone be used to restore MAP in septic shock?' If the price of fluid resuscitation may be edema and organ failure, what may be the price of norepinephrine resuscitation? The fear is that the very same effects that allow norepinephrine to recruit unstressed volume, through alpha adrenergic effects on venous and arterial vasculature, might recruit volume to the macrovasculature, all the while decreasing flow in previously critically collapsible microvascular beds. Answers to this crucial question are still unclear. In two previous conflicting studies showing beneficial [2] or detrimental [3] effects on microvascular blood flow, the discrepancies may have been due to differences in prior fluid therapy and ensuing preload reserve. In order to determine the optimal use of norepinephrine, future studies of microcirculation and perfusion should either optimize on an indicator of fluid responsiveness during the fluid therapy preceding norepinephrine treatment or rapidly wean the inevitable early norepinephrine infusion rate once the targeted MAP is obtained by screening for and addressing preload dependency during infusion rate decrements [4].

Abbreviations
MAP = mean arterial pressure.

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

Published: 3 November 2010

References

1. Hamzaoui O, Georger J-F, Monnet X, Ksouri H, Maizel J, Richard C, Teboul J-L: **Early administration of norepinephrine increases cardiac preload and cardiac output in septic patients with life-threatening hypotension.** *Crit Care* 2010, **14:**R142.
2. Jhanji S, Stirling S, Patel N, Hinds CJ, Pearse RM: **The effect of increasing doses of norepinephrine on tissue oxygenation and microvascular flow in patients with septic shock.** *Crit Care Med* 2009, **37:**1961-1966.
3. Dubin A, Pozo MO, Casabella CA, Palizas F, Jr., Murias G, Moseinco MC, Kanoore Edul VS, Palizas F, Estenssoro E, Ince C: **Increasing arterial blood pressure with norepinephrine does not improve microcirculatory blood flow: a prospective study.** *Crit Care* 2009, **13:**R92.
4. Kipnis E, Robin E, Vallet B: **Refining the tools for early goal-directed therapy in septic shock**. In *Yearbook of Intensive Care and Emergency Medicine.* Edited by Vincent J-L. Heidelberg: Springer-Verlag; 2009:205-218.

doi:10.1186/cc9299
Cite this article as: Kipnis E, Vallet B: **Early norepinephrine resuscitation of life-threatening hypotensive septic shock: it can do the job, but at what cost?.** *Critical Care* 2010, **14:**450.

*Correspondence: ekipnis@gmail.com; benoit.vallet@chru-lille.fr
Department of Anesthesiology and Critical Care Medicine, University Hospital of Lille, Huriez Hospital - Rue Michel Polonovski, F-59037 Lille, France