CRITICAL CARE

LETTER

Mind the influence of arterial oxygen tension on central venous oxygen saturation

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See related research by Hernandez *et al.*, http://ccforum.com/content/13/3/R63

We read with great interest the study by Hernandez and colleagues published in *Critical Care* [1]. The study showed that central venous oxygen saturation ($ScvO_2$) increased significantly in response to emergency intubation, and the authors suggested that the early normalization of $ScvO_2$ after intubation might not be reliable to reflect successful resuscitation. However, they might have ignored the influence of arterial oxygen tension (PaO_2) on $ScvO_2$.

It is well known that when arterial oxygen saturation is approaching 100%, the increase in oxygen delivery would be limited in response to the increase of PaO_2. However, a very high PaO_2 could significantly influence $ScvO_2$ even if arterial oxygen saturation reaches 100%. Pre-oxygenation may result in a very high PaO_2 in the emergency intubation, so PaO_2 should be taken as a potentially confounding factor. Very high PaO_2 (about 288 mmHg) has a more significant and consistent effect on $ScvO_2$ than a relevant change in cardiac index (>10%) [2]. Moreover, a decrease in the whole body oxygen consumption under hyperoxia has been reported in critically ill patients [3], and animal studies also noted that hyperoxia could result in the redistribution of cardiac output [4]. Recently, Legrand and colleagues documented that an increase in PaO_2 could increase $ScvO_2$ without increasing oxygen delivery [5].

It is worth paying attention to the impact of PaO_2 on $ScvO_2$ in the management of critically ill patients.

Abbreviations

PaO_2: Arterial oxygen tension; $ScvO_2$: Central venous oxygen saturation.

Competing interests

The authors declare that they have no competing interests.

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