LETTER TO THE EDITOR

The Evolution of Central Venous-to-arterial Carbon Dioxide Difference (pCO_2 Gap) during Resuscitation Affects ICU Outcomes: A Prospective Observational Study

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To the Editor,

We read with immense interest the article by Zirpe et al. addressing the role of central venous-to-arterial carbon dioxide difference (pCO_2 gap) during resuscitation in outcomes of ICU patients.[1] We congratulate the authors for their excellent work. There are a few comments regarding the study that we want to highlight.

- 2D Echocardiography was conducted to measure the cardiac index, which is susceptible to interobserver variability. Was it performed by a single observer or multiple observers?
- All patients in this study were resuscitated according to Surviving sepsis guidelines but a significant proportion (60%) of patients with shock due to other causes (hypovolemic, neurogenic, and combined) were included in this study.
- After 6 hours of resuscitation, patients were categorized into high and low pCO_2 gap groups. What were the respective patient counts in the high and low pCO_2 groups?
- Authors have compared high pCO_2 and low pCO_2 groups in terms of mortality, ICU length of stay, and organ support requirements. However, if they had included a comparison of data regarding differences in the severity of illness, vasopressor requirements, type of shock, and acid-base status between the two groups, it would have offered more insights into the utility of the pCO_2 gap.
- While correlating pCO_2 gap with lactate and cardiac index, we observed a stronger focus on statistical significance rather than on the strength of the observed correlations. The strength of correlation is crucial for evaluating the pCO_2 gap's validity. The significance of Spearman's coefficient is assessed through a significance test. However, it's crucial to understand that the *p* value derived from this test does 'not indicate the magnitude of the correlation between two variables. In reality, with a sufficiently large sample size, the statistical test will consistently show significance, regardless of the strength of the correlation. Rather than presenting *p*-values, we propose that the authors report the confidence intervals around Spearman's coefficients. This approach would redirect the reader's attention from statistical testing of the null hypothesis toward estimating the strength of the observed correlations.[2,3]

We commend Zirpe et al. for their insightful study on the role of central venous-to-arterial carbon dioxide difference (pCO_2 gap) during resuscitation in ICU patients. More data on the differences in clinical characteristics, organ supports, and etiology of shock between the two pCO_2 gap groups would have made this data on the pCO_2 gap more applicable and externally valid. We also emphasize that the strength of correlation to be focused more rather than the *p* value.

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