Category :**Cardiovascular: Other**

A44 - ***Central venous-to-arterial carbon dioxide tension in critically ill covid-19 patients***

K Kaefer [1] ; C David [2] ; D De Bels [1] ; C Pierrakos [1] ; S Fratino [3] ; A Cudia [3] ; D De Backer [4]

[1]CHU Brugmann, ICU, Laeken, Belgium, [2]Institut Jules Bordet, ICU, Brussels , Belgium, [3]CHIREC - Hôpital Delta, ICU, Brussels , Belgium, [4]CHIREC Hospitals - Université Libre de Bruxelles, ICU, Brussels , Belgium

Introduction:

Critically ill patients with coronavirus disease 2019 (COVID–19) may present severe tissue perfusion abnormalities. The mixed venous-to-arterial carbon dioxide tension difference ($P_{va}CO_2$) is an easily derived parameter identifying insufficient tissue perfusion. The purpose of this study was to evaluate the clinical relevance of high values of $P_{va}CO_2$ in COVID−19 patients early after their admission to intensive care unit (ICU). We speculated that high $P_{va}CO_2$ values might be associated with poor outcome in critically ill COVID–19 patients.

Methods:

This was a retrospective study conducted in two independent centers of Belgium. We included patients treated in the first wave of the national outbreak with available $P_{va}CO_2$ within 3 days of admission and without severe hypercapnia (PCO_2> 75mmHg). The highest value was registered. Normal values were considered ≤ 6 mmHg, moderate elevations 7−9 mmHg, and high elevations >9 mmHg. The primary outcome was ICU discharge alive and secondary outcome mortality at 28 days.

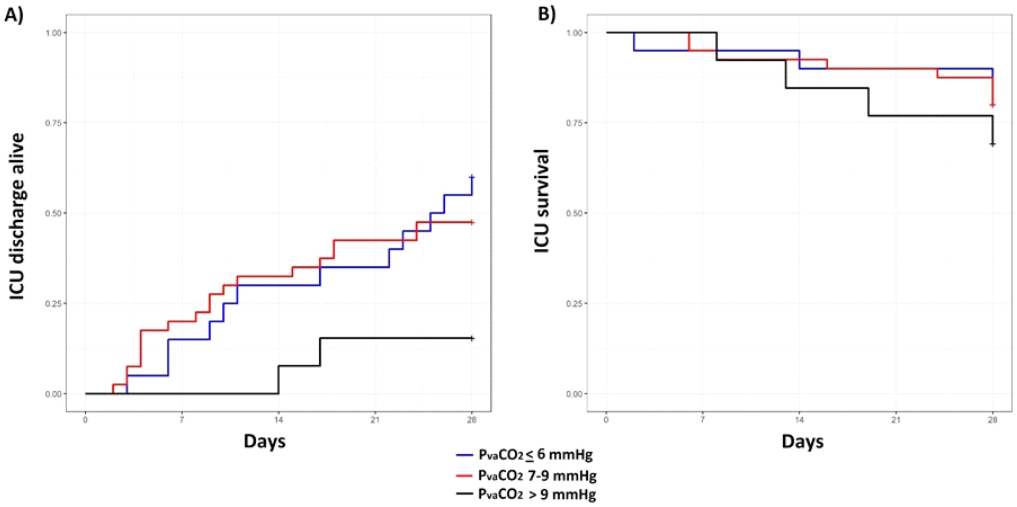
Results:

Seventy-three patients were included with median age of 60 years (IQR: 52 to 68), and simplified acute physiology score II (SAPS II) 26.1 (IQR:19.8 to 29.5). Fifty-three (76%) patients needed invasive ventilation within 24 hours after ICU admission (12 hours (IQR: 12 to 24). The worst ratio of partial pressure arterial oxygen to the fraction of inspired oxygen (PaO_2/FiO_2) within 3 days after admission was 151 (IQR: 86 to 243) and $P_{va}CO_2$ 6 mmHg (IQR: 5 to 9). $P_{va}CO_2$ > 9 mmHg was associated with longer ICU stay (ICU free days: 0 days (0−0) vs 1 day (0−18), P=0.02), independently of PaO_2/FiO_2 and SAPS II score (HR: 0.21, 95%−CI: 0.05−0.92, P=0.04) (Fig, Panel A), but not to 28 days mortality (HR:1.71 , 95%−CI: 0.48−5.91, P=0.41) (Fig, Panel B).

Conclusion:

In COVID–19 patients, high $P_{va}CO_2$ values early after ICU admission are associated with prolonged ICU stay independently of hypoxemia and disease severity.

Image :



PvaCO2 and outcome probability of ICU discharge (A) and survival (B) at 28 days