

Category : **Cardiovascular: Monitoring**

**A170 - Tidal volume challenge to predict preload responsiveness in patients with acute respiratory distress syndrome under prone position**

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**Introduction:**

Testing preload responsiveness in patients with acute respiratory distress syndrome (ARDS) during prone position without requiring cardiac index (CI) measurements has been poorly investigated. Our study aimed to evaluate the ability of pulse pressure variation (PPV) and its changes during a 1-min tidal volume (TV) challenge (TVC) to assess preload responsiveness in ARDS patients under prone position.

**Methods:**

Patients with ARDS ventilated with a 6 mL/kg TV under prone position were prospectively included. By using a pulse contour analysis monitor, we measured PPV and changes in CI during a Trendelenburg maneuver ( $\Delta CI_{\text{TREND}}$ ). After transiently increasing TV to 8 mL/kg, we measured first absolute changes in PPV during TVC ( $\Delta PPV_{\text{TVC}_{6,8}}$ ) and then changes in CI during end-expiratory occlusion (EEO) ( $\Delta CI_{\text{EEO}_8}$ ). Preload responsiveness was defined by both  $\Delta CI_{\text{TREND}} \geq 8\%^1$ ) and  $\Delta CI_{\text{EEO}_8} \geq 5\%^2$ . Preload unresponsiveness was defined by both  $\Delta CI_{\text{TREND}} < 8\%$  and  $\Delta CI_{\text{EEO}_8} < 5\%$ .

**Results:**

Eighty-four cases were analyzed in 58 patients (65±11 y.o.) under prone position for 11(2-14) hours. The mean arterial pressure was 82(75-90) mmHg (under norepinephrine in 83% cases). The driving pressure was 12(10-18) cmH<sub>2</sub>O, the respiratory system compliance was 32(21-40) mL/cmH<sub>2</sub>O and the ratio of partial pressure arterial oxygen and fraction of inspired oxygen was 104±27 mmHg. Forty-two cases were classified as preload responders. The baseline PPV predicted preload responsiveness with an area under the receiver operating characteristic curve (AUROC) of 0.85±0.04 (threshold 5%; sensitivity: 74%, specificity: 79%). The  $\Delta PPV_{\text{TVC}_{6,8}}$  predicted preload responsiveness with an AUROC of 0.94±0.03 (threshold 2%; sensitivity: 98%, specificity: 88%) ( $p=0.03$  vs. PPV).

**Conclusion:**

In patients with ARDS under protective ventilation during prone position, the changes in PPV during a 1-min TVC could reliably assess preload responsiveness without the need of CI measurements.

**References:**

1. Yonis et al. Crit Care 2017;21:295.
2. Gavelli et al. Ann Intensive Care 2020;10:65.