

## Fluid responsiveness in patients under mechanical ventilation and low tidal volume ventilation through the pulse pressure variation after tidal volume challenge in the post-operative cardiac surgery

D.F.C. Azevedo, R.M. Viera De Melo, A.C. Cunha, L.G.S. Brito, T. Viana, C.S. Figueiredo, B.C.S. Gomes, C.G. Bezerra, A.O. Tamazato, R.P. Santos Junior, R.A. Rangel, F.C. Oliveira, O.R. Nascimento Junior, D.N.V. Da Silva, L.C.S. Passos

Hospital Ana Nery, Cardiology, Salvador, Brazil

**Funding Acknowledgement:** Type of funding sources: None.

**Background:** It is known that in the immediate postoperative period of cardiac surgery, strict control of hemodynamic variables and blood volume is necessary, since there is an imbalance between oxygen supply and consumption. Thus, the present study seeks to validate methods previously used in different clinical situations to predict fluid responsiveness, in the current scenario of the immediate postoperative period of cardiac surgery.

**Purpose:** To evaluate the influence of "tidal volume challenge" from 6 ml / kg to 8 ml / kg of the predicted body weight (PBW) in conjunction with the end expiratory occlusion test (EEOT) in the variation of pulse pressure to predict fluid responsiveness in the immediate postoperative period of cardiac surgery.

**Methodology:** This prospective study included 30 patients after cardiac surgery. Hemodynamic and ventilatory parameters were initially recorded in mechanical ventilation at 6 ml/kg and after tidal volume challenge and with the EEOT at 8 ml/kg of predicted body weight (PBW). After recorded the intervention data, there was a return to ventilation at 6 ml/kg and a saline infusion of 500 ml was performed for 15 minutes. Fluid responsiveness was defined for patients who had an increase of 10% or more in ve-

locity time integral (VTI) by echocardiogram after volume expansion compared to baseline value. Multivariate analysis was used to identify independent predictors of fluid response status. Sensitivity and specificity analyzes were performed to determine the predictive precision of each parameter.

**Results:** The main result of our study is that, when the tidal volume is increased from 6 to 8 ml/kg of PBW, the relative increase in pulse pressure variation ( $\% \Delta PPV_{6-8}$ ) predicts with excellent accuracy responsiveness to fluids with cut-off values of 18.3%, with sensitivity of 92.9% and specificity of 84% ( $P=0.019$ ). Although changing PPV6, EEOT6 and EEOT8 are not reliable in predicting fluid responsiveness, they still require additional calculations. PPV8 also discriminates between responders and non-responders; however, with sensitivity (78.6%) and specificity (66.6%) when the value found in the PPV8 is up 8.5, but without statistical significance (figure).

**Conclusion:** The challenge of tidal volume and its influence on the  $\Delta PP$  variation has excellent accuracy to predict fluid responsiveness in the immediate postoperative period of cardiac surgery. EEOT did not present good accuracy to predict fluid responsiveness in patients in the immediate postoperative period of cardiac surgery.

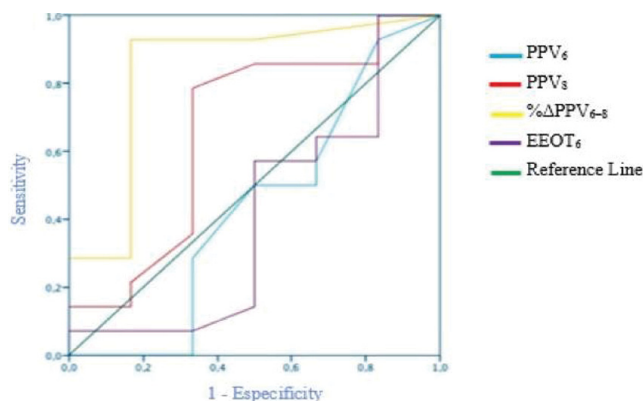


Figure 1: Receiver-operating characteristic curves comparing the ability of various variables to discriminate between fluid responders and non-responders.