

Category : **Cardiovascular: Other**

A90 - Moderate elevations in positive end expiratory pressure (peep) in a patient with ards and severe systolic heart failure can decrease oxygen delivery: a case report

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Introduction:

Positive end-expiratory pressure (PEEP) may improve oxygenation and left ventricular (LV) function in patients with acute respiratory distress (ARDS). The aim of this case study was to assess the hemodynamic and oxygenation effects of moderate PEEP elevation in an invasively ventilated patient with ARDS and severe systolic LV dysfunction. We hypothesized that moderate PEEP elevations may improve oxygenation, LV function and oxygen delivery (DO₂).

Methods:

A 72-year-old patient with severe heart failure and severe ARDS (PaO₂/FiO₂: 60) due to *Legionella* infection was assessed. The patient was submitted to invasive ventilation (tidal volume of 5.6 ml/kg of predicted body weight and PEEP of 3 cm H₂O). PEEP was progressively increased up to 15 cm H₂O for improving oxygenation.

Echocardiographic and hemodynamic variables from Swan-Ganz catheter were obtained before and 20 minutes after each PEEP modification.

Results:

At baseline, the patient had a LV ejection fraction of 10%, tricuspid annular plane systolic excursion (TAPSE) of 19 mm and cardiac index of 2.5 L/min/m². PEEP elevation increased oxygen saturation (from 91% to 95%), mixed venous saturation (60% to 72%) and driving pressure (11 to 15 cmH₂O) but DO₂ decreased (329 to

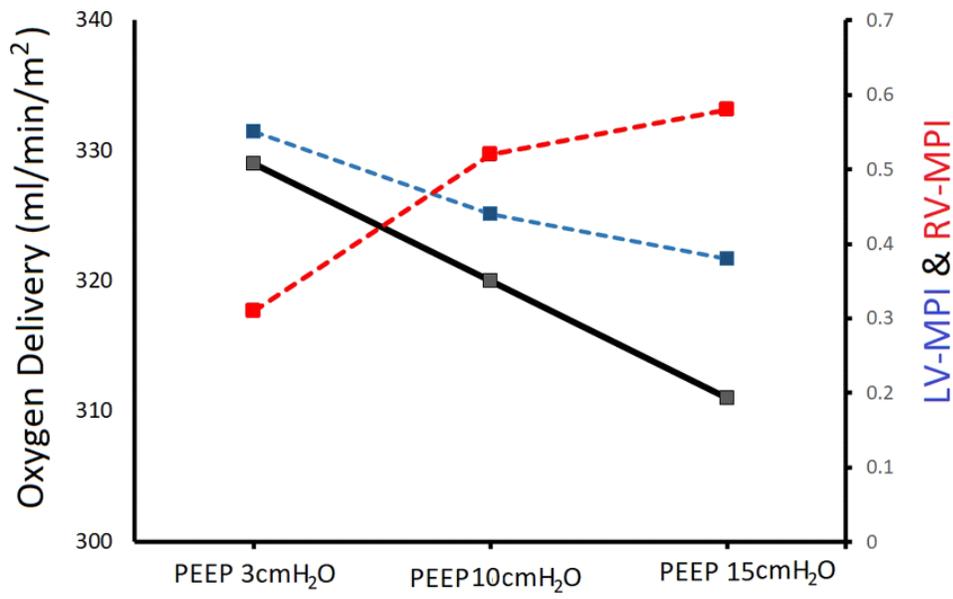
311 mL/min/m²). LV function improved as indicated by left ventricular global longitudinal strain (-9% to -14%) and LV myocardial performance index (LV-MPI 0.55 to 0.38). In contrast, right ventricular (RV) function deteriorated as indicated by RV myocardial performance (RV-MPI 0.31 to 0.58). TAPSE/Systolic Pulmonary Artery Pressure ratio decreased from 0.32 to 0.11.

Conclusion:

This case suggests that in a patient with severe systolic heart dysfunction and ARDS, moderate PEEP elevations may deteriorate oxygen delivery despite left ventricular function and oxygenation improvement. RV–pulmonary vascular coupling assessment can be clinical relevant parameter for PEEP choice.

Written informed consent was obtained from the next of kin.

Image :



Evolution of cardiovascular and oxygen delivery parameters according to changes in positive end-expiratory pressure (PEEP)