

# The influence of Intrinsic positive end-expiratory pressure on respiratory mechanics and gas exchange in ARDS patients

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Argomento: Insufficienza respiratoria acuta e ventilazione meccanica

## **Purpose**

Acute respiratory distress syndrome (ARDS) is characterized by an increase in lung elastance and airway resistance. Few studies reported the presence of intrinsic positive end expiratory pressure (PEEPi) in ARDS.

Aim of this study was to evaluate in a large population of ARDS the prevalence of PEEPi, its influence on gas exchange and response to PEEP.

## **Materials and methods**

217 patients, previously enrolled in 6 published studies, were analyzed.

The PEEPi was computed as the difference between the total PEEP measured at the end of an expiratory pause and external PEEP measured at the end of expiration of a regular breath. Data were collected at baseline and at two different PEEP levels (5-15 cmH<sub>2</sub>O). Patients were divided in two groups according to the presence of PEEPi (PEEPi vs NO-PEEPi)

## **Results**

PEEPi was detected in 87 patients. At baseline, respiratory rate (18 [16-21] vs 15 [12-20] breath/min), minute ventilation (9.0 [7.6-11.6] vs 8.2 [6.8-9.7] L/min) and arterial carbon dioxide (44 [39-51] vs 41 [36-48] mmHg), were significantly higher in PEEPi patients, while oxygenation (P/F 159 [119-193] vs 188 [142-225]) and tidal volume (480 [420-550] vs 500 [450-600] mL) were lower.

At both PEEP levels, respiratory system resistance was not different between the two groups, while lung and respiratory system elastance were lower in patients with PEEPi.

PaO<sub>2</sub> was similar between the two groups at 5 cmH<sub>2</sub>O of PEEP and similarly increased at 15 cmH<sub>2</sub>O, while PaCO<sub>2</sub> and physiological dead space were not different.

## **Conclusions**

The prevalence of PEEPi in our population of ARDS patients was 40%. PEEPi was more frequent in

patients ventilated with higher respiratory rate and lower tidal volume. The presence of PEEPi does not seem to influence partitioned respiratory mechanics, gas exchange or PEEP response. The mechanism involved in generating PEEPi could be related to ventilatory setting.