

# Effects of PEEP on the pathogenesis of acute respiratory distress syndrome in a porcine model: an electrical impedance tomography study

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Argomento: Insufficienza respiratoria acuta e ventilazione meccanica

## INTRODUCTION

EIT (Electrical Impedance Tomography) provides reliable evaluation of impedance in the thorax by injecting alternating electrical current and measuring the resulting potential differences. (Bodenstein et al.) The EIT can support clinical decisions to avoid atelectasis and regional hyperinflation in severe patients. In our study we aimed to indagate the role of positive end expiratory pressure (PEEP) in the progression of lung damage and we focused on the distribution of gas in six regions in the lungs in a high volume mechanical ventilation model.

## METHODS

We ventilated in prone position 36 healthy pigs ( $23.3 \pm 2.3$  Kg) randomly assigned to 6 PEEP groups (0, 4, 7, 11, 14, 18 cmH<sub>2</sub>O) keeping constant the respiratory rate to 30 min<sup>-1</sup> and the high tidal volume (equal to the functional residual capacity) and monitoring the impedance continuously for 50 hours with Draeger Pulmovista 500. We considered for every region of the lung the relative impedance variation, computed as the change at every timepoint from the baseline measurement.

## RESULTS

A decrease in impedance was observed in the entire lung in all pigs, but predominantly in the ventral regions in every peep group over time (Anova time factor  $p < 0.001$ ). Impedance was higher in lower PEEP group ( $p < 0.001$ ) but the interaction factor between peep and time was not significant ( $p = 0.60$ ), suggesting that the kinetic of impedance was not different among PEEP groups.

## CONCLUSIONS

Relative impedance decreased regardless of the use of the higher PEEP level, suggesting that, at strain equal to 1, PEEP could be ineffective to protect against atelectasis or edema.