Category :**Respiratory: mechanical ventilation**

A293 - ***Lateral positioning as a new lung recruitment maneuver - an experimental ards model study***

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Introduction:

Recruitment maneuvers (RM) are designed to open collapse lungs and keep them opened, based on the application of high pressures during a period of time. However, they expose the patient to hemodynamic instability and their beneficial effects are debatable. Lateral positioning does not require the application of higher airway pressures and could promote alveolar recruitment due to changes in regional transpulmonary pressure.

Methods:

Six pigs were submitted to invasive mechanical ventilation under general anesthesia. A lung injury model was produced by sequentially applying lung lavage followed by injurious ventilation to obtain a PF ratio < 100mmhg. After injury, a RM was performed and open-lung-PEEP (lowest PEEP with collapse < 1%) was chosen during a decremental PEEP titration guided by EIT. After observing massive collapse at PEEP = 5cmH_2O, animals were ventilated with VT=6mL/Kg, RR 25bpm and optimal PEEP without recruitment maneuver. All animals were sequentially positioned at (1) supine position, (2) tilted to the left (down), (3) back to supine, (4) tilted to right (down) during 20 minutes, and finally back to (5) supine. We evaluated the End Expiratory Lung Impedance (ELLZ), arterial blood gases, and respiratory mechanics. Paired T tests were performed to compare the first supine with the last supine position.

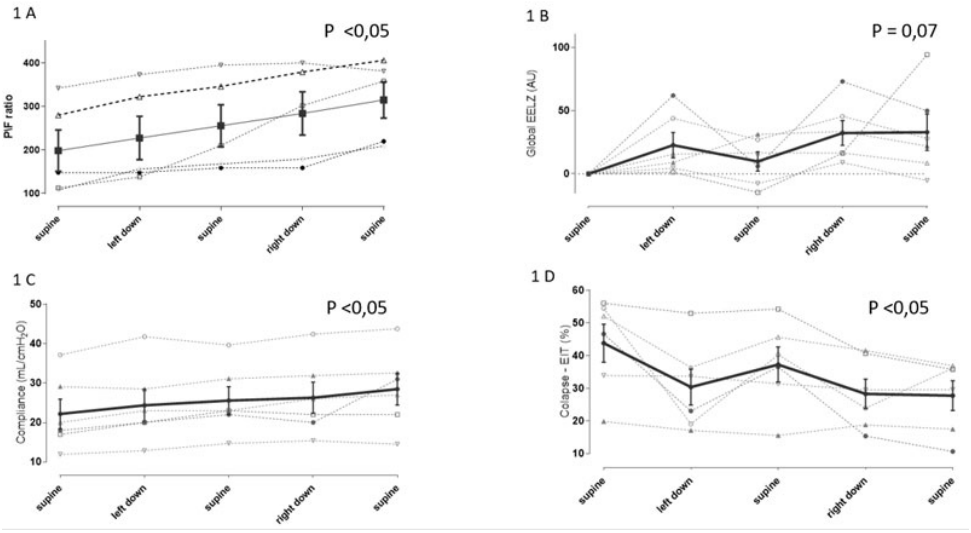
Results:

all animals presented an increase in respiratory compliance (P= 0.008; figure 1A) and PaO_2/FIO_2 ratio (P= 0.009; figure 1C). In five of six animals EELZ increased (P=0.07), while one animal lost aeration probably due to insufficient PEEP (figure 1B). The amount of mass of collapsed lung measured by EIT decreased after the lateral positioning (P= 0.02; figure 1D). Adverse hemodynamics effects were not observed.

Conclusion:

Sequential lateral positioning effectively works as a recruitment maneuver, opening collapsed lung areas, improving respiratory mechanics, oxygenation and EELZ, without requiring high airway pressures and presenting no adverse hemodynamics effects.

Image :



Changes, during sequential lateral position, in PaO2/FIO2 ratio (1A), global End Expiratory lung impedance (EELZ) (1B), respiratory compliance (1C) and mass of collapsed lung (%) estimated by EIT (1D). A significant improvement in PaO2/FIO2 ratio, respiratory compliance and mass of collapsed lung was observed when comparing the first supine position with the final supine position. The gray lines represent each of the 6 animals and the black line show the mean values and standard error (SE) of the 6 animals. Paired T tests were performed to compare the first supine with the last supine position.