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Abstracts

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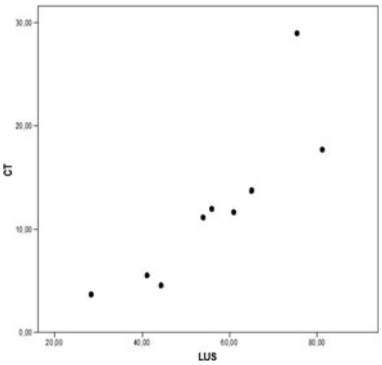

Figure 1. Comparison CT vs LUS

0138

VENTILATION DISTRIBUTION DURING DIFFERENT PRESSURE SUPPORT AND NAVA LEVELS

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INTRODUCTION. Electrical Impedance Tomography (EIT) is a non-invasive and non-radiating imaging technique, which can be used to visualize ventilation at the dependent and non-dependent part.

OBJECTIVES. The aim of this study was to observe ventilation distribution between dependent and non-dependent lung region during different levels of support during pressure support (PS) and Neurally Adjusted Ventilatory Assist (NAVA) ventilation.

METHODS. Ventilation distribution was measured with EIT. Three levels of support were tested: 5, 10 and 15 cmH_2O. The level of electrical activity of the diaphragm (Edi) during support of 10 cmH_2O was defined NAVA 100 %. Thereafter, also three levels of NAVA level were tested: 50, 100 and 150 %.

RESULTS. The ratio dependent/non-dependent distribution of ventilation is significantly higher at 5 cmH_2O of support compared to 10 and 15 cmH_2O. This is the same during NAVA. During NAVA there was significant less impedance loss between steps compared to pressure support.

CONCLUSIONS. There is relative more ventilation in the dependent part of the lung at lower support levels. This indicates that at higher support levels the contribution of the diaphragm is less.

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VENTILATION AREA MEASURED WITH EIT IN ORDER TO OPTIMIZE PEEP SETTINGS IN MECHANICALLY VENTILATED PATIENTS

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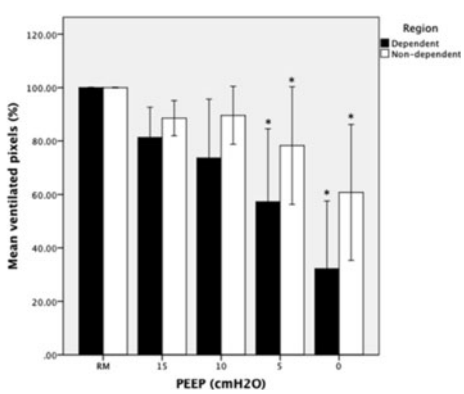
INTRODUCTION. Electrical Impedance Tomography (EIT) is a non-invasive imaging technique, which can be used to visualize ventilation. Ventilation will be measured by impedance changes due to ventilation.

OBJECTIVES. The aim of this study was to optimize PEEP settings based on the ventilation area of EIT images during a decremental PEEP trial.

METHODS. After a recruitment maneuver, a decremental PEEP trial was performed in 10 mechanically ventilated post cardiac surgery patients. Ventilation area, blood gases, FRC and compliance were measured at each PEEP level. The ventilation area was defined as the surface of ventilation at one lung slice measured with EIT and was expressed as percentage of its maximum obtained during a recruitment maneuver (RM).

RESULTS. The amount of ventilated pixels during the RM is set as 100 %. Figure 1 shows the amount of ventilated pixels as percentage compared to its maximum during the RM. The ventilation area was significantly smaller at 5 and 0 PEEP compared to its maximum at both the dependent and non-dependent lung. Also PaO_2/FiO_2 and FRC were significantly lower at these PEEP levels.



Ventilation distribution during a PEEP trial

Bars represent the mean ± SD. Black = dependent lung region, White = non-dependent lung region. * $p < 0.05$ compared to RM.

CONCLUSIONS. Changes in ventilation area based on EIT images can be used to set the PEEP level in mechanically ventilated patients.

0140

ANALYSIS OF ALVEOLAR VENTILATION WITH DIFFERENT DEGREES OF INTRAABDOMINAL HYPERTENSION IN PORCINE MODEL

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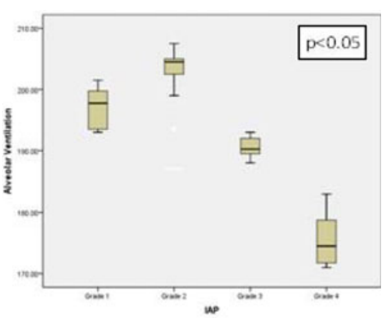
INTRODUCTION. Increased intra-abdominal pressure is a common condition in intensive care patients. The affection of respiratory mechanics is a complication by increasing intra-abdominal pressure; we have several methods allow us to assess the ventilatory changes in respiratory mechanics with increased intraabdominal pressure. One of these methods is volumetric capnography, with which we can measured the alveolar ventilation and dead space. The alveolar ventilation may be related to the amount of CO_2 exhaled, so that through this, we can determine changes at the alveolar ventilation with respect to different degrees of intra-abdominal hypertension (World Society of Abdominal Compartment Syndrome).

OBJECTIVES. Analyze the behavior of alveolar ventilation (VA) based on volumetric capnography with different degrees of intra-abdominal pressure in porcine model.

METHODS. 3 porcine models were evaluated, weighing 35 kg, which was induced in increased intra-abdominal pressure with the administration of saline solution 0.9 % through abdominal catheter, with measurements every minute and increased intraabdominal pressure 5 mm Hg every 10 min up to 30 mmHg intraabdominal pressure. Mechanical ventilation: PEEP 5, Vt of 320 ml, FiO_2 40 %. The measurement of production of carbon dioxide (VCO_2) was performed through of volumetric capnography (Dräger Evita XL). It was estimated exhaled tidal volume (Vte) every minute in each degree of intra-abdominal hypertension. The dead space volume (DV) was derived according to the formula of Fowler. Alveolar ventilation (VA) was defined as: VA = Vte-VD. We conducted analysis of variance of alveolar ventilation in relation to the degree of intra-abdominal pressure, we consider as significant $p < 0.05$. We use the SPSS V.18

RESULTS. The PIA initial average was 3 mmHg. With the gradually increase in intra-abdominal pressure we observed decrease in alveolar ventilation with increased dead space. Among other variables, we observed decrease in static compliance.



Alveolar ventilation and IPA

CONCLUSIONS. The increased intraabdominal pressure above that corresponding to grade 2 abdominal hypertension condition decreased alveolar ventilation obtained by volumetric capnography. These findings should be evaluated and considered in critically ill patients to maintain alveolar opening in intra-abdominal hypertension.

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Acute kidney injury: Evaluation & treatment: 0141–0154

0141

EMPLOYING ADVANCED ALGORITHMIC METHODS TO PREDICT FUTURE CREATININE

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INTRODUCTION. Intensive care units are one of the arenas in the medical world where a large amount of digital data is continuously collected for all patients. It is also a place where doctors' immediate response to changes in the patients' status are of utmost importance. The ability to detect such changes, as early as possible, using the collected digital data, would significantly improve the medical treatment and may assist in saving lives.

OBJECTIVES. In this work, we explored the possibility of harnessing the power of computers and advanced algorithms for prediction of significant rise in the measured Creatinine (*Cr*) level (an indicator of risk of renal failure). The prediction is based on the digital measurements continuously collected in the ICU.