THE PULMONARY IMMUNE EFFECTS OF DIFFERENT VENTILATORY SETTINGS IN PATIENTS UNDERGOING THORACIC SURGERY

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Introduction: Experimental data suggest that mechanical ventilation with high Vt and ZEEP induces not only cytokine release but also translocation of cytokines from the lungs to the systemic circulation. One-lung ventilation is an established procedure during thoracic surgery. Commonly, Vt used during two-lung ventilation (TLV) are recommended during OLV to maintain arterial oxygenation and carbon dioxide elimination. We examined whether a standard ventilation setting (VT = 10 mL/kg) may result in a time-dependent alteration of pulmonary immune function in patients undergoing open thoracic surgery and OLV. Furthermore, we tested whether ventilation with different Vt and positive end expiratory pressure (PEEP) modifies pulmonary immune function, hemodynamics, and gas exchange during OLV.

Patients and Methods: Thirty patients undergoing open thoracic surgery were randomized to receive mechanical ventilation with either (1) Vt = 10 mL/kg on ZEEP, (2) Vt = 6 mL/kg on ZEEP, or (3) Vt = 6 mL/kg on PEEP of 10 cm H2O. Serum and bronchoalveolar lavage samples were examined for interleukin-6 and macrophage inflammatory protein-2.

Results: Data were analyzed by parametric or nonparametric tests, as indicated. In all patients, an increase of proinflammatory variables was found. Concentrations were significantly smaller after OLV with Vt = 6 mL/kg on PEEP of 10 cm H2O.

Conclusion: Mechanical ventilation can induce a cytokine response that may be attenuated by a strategy to minimize overdistention and recruitment/derecruitment of the lung. Whether these physiological improvements are associated with improvements in clinical end points should be determined in future studies.