“Protective” Ventilation During Surgery Lowers Risk for Postoperative Complications

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Ventilation in the operating room probably should resemble ventilation in the intensive care unit.

Low tidal volume ventilation (6 mL/kg predicted body weight; plateau pressure, <30 cm H\textsubscript{2}O) has become the standard of care for patients with acute respiratory distress syndrome (ARDS). Because of concern about ventilator-induced lung injury, lower tidal volumes often are used in the intensive care unit (ICU) for patients without ARDS. This “protective” ventilation is done less commonly in the operating room (OR), where ventilator strategies vary widely.

In this study, investigators examined outcomes in 69,265 patients who underwent general anesthesia for surgical procedures and were extubated immediately postoperatively at three Massachusetts hospitals. Cardiothoracic surgical cases were excluded. Protective ventilation was defined as positive end-expiratory pressure (PEEP) \(\geq\) 5 cm H\textsubscript{2}O, median tidal volume <10 mL/kg predicted body weight, and median plateau pressure <30 cm H\textsubscript{2}O. Approximately half the patients met these criteria.

In analyses adjusted for demographic characteristics, comorbidities, and procedure types, patients who received protective ventilation were significantly less likely than those who were nonprotectively ventilated to develop major postoperative pulmonary complications (reintubation, respiratory failure, pneumonia, or pulmonary edema; odds ratio, 0.90). Interestingly, this benefit was associated with lower plateau pressure (<30 cm H\textsubscript{2}O) and PEEP of \(\geq\) 5 cm H\textsubscript{2}O but not with size of tidal volume.

**Comment:** This observational study suggests that ventilation in the OR should be more like ventilation in the ICU. Maintaining at least a low level of PEEP to avoid atelectasis makes sense. Minimizing driving pressures (i.e., by lowering plateau pressure) also is a physiologically sound principle and is supported by a growing body of literature.

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