

招-I Ventilation in ARDS-beyond the ARDSNet trial

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Recent understanding of ventilator-induced lung injury has resulted in the development of ventilatory strategies aimed at reducing lung injury. Lung involvement in ARDS is not uniform, and the small fraction of uninvolved lung capable of gas exchange must be protected from excessive inflation pressure. Several randomized controlled trials have been reported over the past 4 years, of which 2 have demonstrated a mortality benefit. The ARDSNet study demonstrated that limiting tidal volume to 6 ml/kg predicted weight (plateau pressure < 32 cmH₂O) is associated with a decreased mortality rate, compared with patients ventilated at 12 ml/kg. However, since that trial was initiated, a number of other therapeutic options have been introduced which may have additional benefits.

Lung injury due to inadequate PEEP is becoming recognized as a potential cause of deterioration in ARDS, due to alveolar damage resulting from repeated opening and closing of alveoli. The use of sustained inflation maneuvers and high PEEP levels, to recruit atelectatic lung, was introduced in the study by Amato and colleagues. Subsequent small case series and physiological studies have highlighted the importance of an "open lung" ventilatory approach. This is currently being investigated in a multi-centre study underway in Canada—the "Lung Open Ventilation Study", comparing the ARDSNet protocol with an "Open Lung" regimen.

In addition to optimizing ventilatory pressures, other maneuvers have been used to improve oxygenation, although mortality benefit has not been demonstrated. Use of the prone position may

improve oxygenation by increasing blood flow through well aerated preciously non-dependent areas, and improving pulmonary mechanics. However, a large randomized controlled trial did not demonstrate an

outcome benefit. Nitric oxide may have dramatic effects on oxygenation in a certain subgroup of patients, but no improvement in any clinically significant end-point has been shown in clinical trials in adults. High frequency oscillation may provide an ideal, non-injurious mode of ventilation allowing optimization of lung recruitment. However, controlled trials in adults using this modality are lacking.

While the standard of care in the ventilatory management of ARDS is the 6 ml/kg ARDSNet protocol, many new developments are being evaluated, some of which may prove to improve the high mortality associated with this condition.

Selected References

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