

Assessment of lung volume and alveolar pressure during combined high-frequency jet ventilation in a child with adult respiratory distress syndrome.

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Lung volume and alveolar pressure were assessed using inductance plethysmography, airway occlusion and pneumotachography in a child with severe adult respiratory distress syndrome during both conventional mechanical and combined high-frequency ventilation (HFJV). The results suggest that improved oxygenation during combined HFJV is associated with higher end-expiratory lung volume and lower peak and mean lung volume and alveolar pressure.

Combined high-frequency ventilation in children with severe adult respiratory distress syndrome.

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Six children conventionally ventilated for acute pulmonary parenchymal failure developed severe hypoxemia (mean PaO₂ 48 +/- 7 mmHg at an FiO₂ of 0.95 +/- 0.08) persisting for more than 6 h despite a progressive increase in positive end expiratory pressure (PEEP) to 14.7 +/- 1.5 cmH₂O. Combined high-frequency jet ventilation (HFJV, mean rate 225 b/min superimposed on small tidal volume conventional ventilation) resulted in a sustained increase in PaO₂ to 93 +/- 21 mmHg, p less than 0.05 while peak inspiratory pressure decreased from 47 +/- 8 to 35 +/- 6 cmH₂O and positive end expiratory pressure could be reduced to 5.8 +/- 4.5 cmH₂O, p less than 0.05 and FiO₂ to 0.88 +/- 0.10. This improvement occurred without new barotrauma nor deleterious effects on hemodynamic function or diuresis. After a mean of 62 h of combined function or diuresis. After a mean of 62 h of combined HFJV, persistent improvement in gas exchange allowed us to resume conventional mechanical ventilation at lower airway pressures in 4 children who continued to improve and survived. The 2 other children maintained satisfactory gas exchange on combined HFJV, but ultimately died from multiple organ failure. We conclude that combined HFJV might prove helpful to relieve profound hypoxemia and possibly decrease the risk of barotrauma in children with catastrophic pulmonary failure.