

## Lung function

### **Effects of high-frequency jet ventilation (HFJV) vs conventional mechanical ventilation (CMV) in two models of acute lung injury**

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**Aim:** Severe acute lung injury (ALI) usually requires ventilatory support, which is standardly supplied by CMV. Despite HFJV is often used in surgical interventions and has some favourable properties potentially useful in ALI, it is rarely used in ALI. Therefore, this study compared effects of HFJV and CMV on lung function parameters in two rabbit models of ALI: saline-lavage (LAV) induced model of ALI and model of meconium aspiration syndrome (MAS) to estimate therapeutic potential of HFJV in ALI.

**Methods:** Anesthetized adult rabbits were initially ventilated with CMV. After induction of respiratory insufficiency by repetitive saline lung lavage (LAV model) or intratracheal meconium instillation (MAS model), animals were divided into 4 groups and ventilated either with HFJV (f. 150/min) or CMV for additional 4 hours. Ventilatory pressures, blood gases, and indexes of gas exchange were measured in regular intervals. At the end of experiments, animals were overdosed by anesthetics and lung edema formation was determined by wet-dry lung weight ratio.

**Results:** Repetitive saline lung lavage in LAV groups and meconium instillation in MAS groups caused serious acute lung injury with decrease in lung compliance, increase in airway resistance, and profound hypoxemia, hypercarbia and acidosis compared to initial values. Both types of ventilation (HFJV and CMV) were able to supply sufficient gas exchange within the period of observation, without clinically relevant differences in the lung function parameters or lung edema formation between the groups ventilated with different type of ventilation (LAV+HFJV vs LAV+CMV, or MAS+HFJV vs MAS+CMV, respectively).

**Conclusion:** Both HFJV and CMV are suitable for ventilation of non-homogenously injured lung in ALI.

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