

COMPARISON OF THREE TYPES OF SMALL-VOLUME VENTILATION IN AN EXPERIMENTAL MODEL OF MECONIUM ASPIRATION SYNDROME

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Ventilation support in severe meconium aspiration syndrome (MAS) is realized by small-volume techniques: conventional mechanical ventilation (CMV) and high-frequency oscillatory ventilation (HFOV), or rarely with high-frequency jet ventilation (HFJV). This study compared effects of these modes on lung functions and inflammation in experimental MAS. Respiratory insufficiency in adult rabbits was induced by intratracheal meconium instillation. Animals were divided into 3 groups and ventilated either with CMV, HFOV, or HFJV for additional 4 hours. Parameters of ventilation and gas exchange were measured regularly during the experiment. After overdosing the animals, lung edema formation was determined from wet-dry lung weight ratio. Concentrations of proinflammatory cytokines (IL-1 β , TNF α , IL-8) were measured in the plasma and lung tissue homogenates. Meconium instillation decreased lung compliance and deteriorated gas exchange compared to initial values, and triggered inflammation. All tested ventilations (CMV, HFOV and HFJV) supplied sufficient gas exchange without clinically relevant differences in the lung function parameters, edema formation, or concentrations of inflammatory markers between the groups despite slightly better results were observed in HFOV group. Small-volume modes of ventilation, particularly HFOV, are suitable for ventilation in an acute phase of experimental MAS. Support: BioMed Martin (ITMS 26220220187), APVV-15-0075, APVV-0435-11, VEGA 1/0305/14.