High Frequency Ventilation in Neonates

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There are many examples of high frequency ventilation (HFV) in nature. The key difference from conventional mechanical ventilation (CMV) is the usage of unusually high rates and low tidal volumes. The cyclic changes in lung volume during large tidal ventilation are believed to be an important factor in causing lung injury. Many randomized controlled trials have been conducted to test the efficacy of HFV in the reduction of chronic lung diseases in premature infants. Outcomes of the early trials, including the HIFI study, were disappointing. Subsequent studies, in which a strategy to promote lung recruitment and maintenance of lung volume was used, showed favourable outcomes. HFV used with a high lung volume strategy, applied by experienced neonatologists under vigorously controlled conditions, do offer some protection from lung injury in preterm infants. However it is not without complications. Meta-analysis of randomized controlled trials suggested that the benefits of HFV in reducing chronic lung diseases appeared to be outweighed by concerns about the increased rates of pulmonary air leak and severe intraventricular haemorrhage. Experience is an important element in the safe and efficient use of HFV particularly in premature infants. Many uncertainties about the use of HFV, such as the long term risk-benefit ratio, still remain and await further research. (HK J Paediatr (new series) 2003;8:113-120)

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