

Elective High-frequency Oscillatory Ventilation in Neonates—Playing Devil's Advocate?

In reference to the article on elective high-frequency oscillatory ventilation (HFOV) published in the May issue [1] the following points need to be further addressed.

Firstly, as stated in the Introduction, the utility of HFOV in the management of hyaline membrane disease is no more considered as 'controversial'. During the last 30 years there has been great debate about the best ventilatory mode in preterm infants in order to avoid short- and long-term complications. However, the current evidence including the Cochrane review and the meta-analysis of individual patients' data in 2010 (3229 infants from 10 randomized controlled studies) provides no grounds to favor elective HFOV in preterm infants with acute pulmonary dysfunction [2,3]. The latter analysis also showed that the effect of HFOV (for outcomes including death, oxygen dependency, and neurological injury, alone or in combination) is similar across various birth weight, gestational age and ventilation strategy subgroups [3]. This means that elective HFOV has no definite advantage over optimally applied conventional ventilation ('gentle ventilation') in improving pulmonary outcome in neonates. This is despite animal studies demonstrating the beneficial effect of HFOV in oxygenation and lung recruitment, subsequently reducing ventilator-induced lung injury (VILI).

Secondly, in the current study, the HFOV group demonstrated higher mean PaO₂ at various points of measurement during the first few days of ventilation, which surpassed the target range of 90 mm Hg more often than the control group (12.2% vs 3.3%). The pilot study conducted by the authors also showed similar results [4]. Therefore, it is important to note that the possibility of hyperoxemia and dangerous CO₂ wash-out should be considered while initiating HFOV. The higher incidence of

hyperoxemia and hypocapnea documented in the current study is an important cause for concern, especially in inexperienced hands. Further, the risk of pulmonary air-leak (pulmonary interstitial emphysema) in HFOV (relative risk [RR] 1.15, 95% CI 1.00–1.33), noted in the recent meta-analysis, could be possibly imputed to over-ventilation [3].

Finally, notwithstanding the fact that HFOV in preterm infants is as effective and safe as conventional ventilation, there is a need for studies specifically looking at the cost-effectiveness of HFOV because several studies in the past and the current study documented a significantly shorter duration of ventilation and hospital stay in HFOV [4,5]. Correspondingly, the recent meta-analysis showed that the age at extubation was lower for HFOV with some evidence suggesting discontinuation of continuous positive nasal airway pressure earlier with HFOV than with conventional ventilation [3].

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