IS HFOV STILL RELEVANT IN 2015?

Is HFOV still relevant in the era of NIV?

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Ventilation by High-Frequency Oscillation in Humans

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Assisted ventilation in Australia and New Zealand

Tingay et al JPCH 2007

Assisted ventilation in Australia and New Zealand

ANZNN Report 2012
HFOV use by gestational age

Trends in HFV use by disease type

All disease p<0.05
Indicators of illness severity

Highest appropriate $F_{IO2}$ in the first 12 hours of life

- Significantly greater in the HFV group
  - Median $F_{IO2}$ 0.8 (HFV) vs. 0.5 (CMV); $p<0.0001$
- HFV group more likely to require $F_{IO2}>0.95$
  - 37.2% (HFV) vs. 22% (CMV); $p<0.0001$
- $F_{IO2}>0.95$ related to GA <26 weeks
  - RR 0.95 (95% CI 0.93, 0.97)
- HFV less likely to be in air early
  - 2.6% (HFV) vs. 12.3% (CMV)

Days of assisted respiratory support

- HFV group required more days of assisted respiratory support
  - Median days 21 (IQR 4, 54) vs. 7 (IQR 2, 32); $p<0.0001$

Adverse Outcomes
HFOV use by gestational age at RCH

Broader experiences

PreVILIG Collaborative Group

• IPA of available trials comparing first intention HFOV vs CMV in preterm infants
  – 18 trials (n=3652)

• Sub-group 3-way interaction: prematurity + initial lung disease severity
  – Infants born <26/40 seemed to do worse on HFOV if they had mild lung disease
    • Risk of death or BPD 74% vs 67%
  – But, they did better if they had severe lung disease:
    • Risk of death or BPD 71% vs 87%

Neither reached significance

Unpublished data courtesy of F Cools
Broader Experiences – Intriguing Questions

Late Outcomes of a Randomized Trial of High-Frequency Oscillation in Neonates
Sanja Zivnevec, M.D., Janet Peacock, Ph.D., Urena Alazar-Poni, B.Sc., Jessica W. Lin, M.D., Alan Lui, B.Sc., Neil Markiew, D.M., Sandy Guibet, M.B., B.Ch., and Anne Greenough, M.D., for the United Kingdom Oscillation Study Group

- 319/592 surviving adolescent ex-prems
  - UKOS RCT (n=797, NEJM 2002)
  - HFOV = Superior Pulmonary function tests
  - No differences in functional outcomes except better teacher rated ‘quality of life’ scores

Conclusions

- HFV is a well established as a mode of ventilation for neonatal respiratory failure
- The use of HFV is stable in Aust and NZ
- HFV is used in a relatively high proportion of infants ≤ 25 weeks gestation
- HFV is increasingly being used for diseases of term infants
- The use of HFV is associated with those infants at greatest risk of adverse outcome
- We speculate that HFV is applied as a “late rescue” treatment, when conventional modes of ventilation have failed and the infant is dying