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High rate ventilation as a primary rescue strategy for patients with congenital diaphragmatic hernia: A comparison to high frequency oscillatory ventilation

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Abstract

High frequency oscillatory ventilation (HFOV) is a common rescue strategy for patients with congenital diaphragmatic hernia (CDH). Although shown to increase survival, HFOV can also hinder care when transport is necessary. The purpose of this study is to establish non-inferiority of high rate ventilation (HRV) as a rescue strategy in critically ill CDH patients. We conducted a retrospective review of patients diagnosed with CDH and treated at Children's Hospital of New York (CHONY) from 2005 until present. Patients who utilized neither or both HRV and HFOV were excluded. Potential confounding variables included lung to head ratio, hernia laterality, type of repair, genetic syndrome, gestational age, gender, and birth weight.

The primary outcome was survival with secondary outcomes including need for extracorporeal membrane oxygenation (ECMO), length of stay (LOS), need for nitric oxide (iNO), rate of bronchopulmonary dysplasia (BPD), and age at repair. With single variable analysis comparing HRV to HFOV, median age at repair was lower (4 days vs 7 days, $p<0.001$), odds of needing ECMO were 4.35 times less ($p=0.01$), odds of death were 7.6 times less ($p<0.001$) and odds of needing iNO were 3.8 times less ($p=0.01$).

With multiple variable analysis, the odds of needing iNO were 6 times less with HRV compared to HFOV ($p=0.008$) and the odds of death were 4.22 times less with HRV compared to HFOV, although this finding was not significant. All other outcomes showed no significant difference however trends for each variable show improved outcomes in patients treated with HRV compared to HFOV. Within our population, HRV has comparable outcomes to the more widely accepted rescue strategy of HFOV. This supports the use of HRV as a primary rescue strategy, allowing for increased ability for transport and potentially improved outcomes in these critically ill patients.

Biography:

Claire Gerall completed her MD at University of Texas Health at San Antonio (UTHSA) and began her general surgery residency at UTHSA as well. Now in her fourth year of training, Claire is currently a pediatric ECMO fellow Children's Hospital of New York and a pediatric surgery research fellow at Columbia University College of Physicians and Surgeons. She currently does both clinical and basic science research with focuses in congenital anomalies, prenatal interventions, and pediatric oncology.

Speaker Publications:

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