

## High-Frequency Oscillatory Ventilation and Nitric Oxide to Treat Extreme Hypoxemia

Lanny Inabnit, BS, RRT-ACCS, RRT-NPS, Michael Zgoda, MD: Carolinas Medical Center-University

### Abstract

**Introduction:** Collins and Blank reported positive outcomes related to increased oxygenation in patients diagnosed with ARDS when using HFOV and nitric oxide.<sup>1</sup> They discuss the lung protective abilities of HFOV and the importance of preventing atelectrauma and barotrauma.<sup>1</sup> They also state that nitric oxide is used to “selectively vasodilate the pulmonary vasculature in ventilated alveoli, which improves ventilation-perfusion matching and hypoxemia and lowers pulmonary artery pressure.”<sup>1</sup> We review the case of a patient transferred to our facility due to prolonged hypoxemia despite increased levels of PEEP and FIO<sub>2</sub>.

**Case report:** A 47-year-old female is transferred from a rural medical facility after 6 days of mechanical ventilation with PEEP levels >15 cm H<sub>2</sub>O and an F<sub>I</sub>O<sub>2</sub> sustained at 1.0. This patient tested positive for Influenza A. Patient history included: hypertension, type II diabetes, obstructive sleep apnea, COPD, morbid obesity, and continuous tobacco abuse. The patient was received from the medical facility on Pressure Control 28 cm H<sub>2</sub>O, PEEP 15 cm H<sub>2</sub>O, rate of 18 breaths/min and FIO<sub>2</sub> of 1.0. Patient sedated and paralyzed with Versed, Fentanyl and Rocuronium. Last ABG on these settings is: pH 7.43, PaCO<sub>2</sub> 56 torr, PaO<sub>2</sub> 52 torr, HCO<sub>3</sub><sup>-</sup> 36 mEq/L, SaO<sub>2</sub> 92%. Last chest x-ray shows worsening infiltrates bilaterally. The patient is placed on HFOV: FIO<sub>2</sub> 1.0, mean Paw 38 cm H<sub>2</sub>O, Hz 4, Power 7, Bias Flow 30 L/min, and I-time% 50. 10 ppm of nitric oxide was started due to continued hypoxia. The patient received HFOV for approximately 3 days. Nitric oxide was weaned off in 6 days. A tracheostomy tube was placed on day eighteen. The patient was weaned from mechanical ventilation on day twenty.

**Conclusion:** This case demonstrated that HFOV combined with nitric oxide is an effective treatment of ARDS related to hypoxemia.

## Reference

1. Collins, SR, Blank, RS. Approaches to refractory hypoxemia in acute respiratory distress syndrome: current understanding, evidence, and debate. *Respir Care* 2011; 56 (10): 1573-1582.