High-Flow Oxygen for Respiratory Support

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**Trial support using HFO in selected patients with acute hypoxemic respiratory failure and in patients with postoperative hypoxemia.**

Multiple trials support using noninvasive positive pressure ventilation (NPPV) in patients with chronic obstructive pulmonary disease exacerbations and cardiogenic pulmonary edema. NPPV is most effective in rapidly reversible conditions where supporting the work of breathing can allow pharmacologic interventions to take effect. Whether NPPV is beneficial in treating patients with hypoxemic respiratory failure (i.e., respiratory failure not secondary to conditions causing hypercarbia) is unclear. High-flow oxygen (HFO) generators are a relatively new addition to the spectrum of respiratory support. These set-ups allow for comfortable delivery of very high flows of oxygen (e.g., 60 L per minute). Flows are high enough to achieve low levels of positive end expiratory pressure (PEEP) and potentially to recruit atelectatic alveoli. HFO delivered by nasal cannula might be an alternative to NPPV in patients with hypoxemia as the predominant feature of their respiratory failure. Investigators explored these alternatives in two multicenter European studies.

In one trial, 310 patients with hypoxemic respiratory failure (>60% with community-acquired pneumonia; none with hypercarbia) were randomized to HFO, NPPV, or standard oxygen delivery. Criteria for intubation included relatively conservative thresholds for pH (<7.35) and oxygen saturation (<90% for >5 minutes). Intubation rates did not differ significantly among the three groups but tended to be lower in the HFO group. The HFO group also had significantly lower 90-day mortality, more ventilator-free days, and less respiratory discomfort (NEJM JW Gen Med Aug 1 2015 and N Engl J Med 2015; 372:2185). In the other randomized trial, researchers compared NPPV with HFO in 830 patients with hypoxemia after cardiothoracic surgery. Reintubation rates and intensive care unit mortality were similar in the two groups (NEJM JW Gen Med Aug 1 2015 and JAMA 2015; 313:2331).

The average onset of neuromuscular blockade (defined as ≥95% muscle twitch depression) was 15 seconds shorter in the saline-flush group than the placebo group. The recovery phase was prolonged by nearly 9 minutes in the saline-flush group.

| Comment: | Once RSI is planned and drugs are administered, rapid paralysis is paramount. Although the dose of rocuronium used in this study is lower than that used for emergency airway management, there is no reason to believe a saline flush would not have the same effect with the RSI dose, and this simple additional step could make the onset of action as rapid as that with succinylcholine. The longer recovery phase is irrelevant for emergency physicians, and I see no downside to saline flush with rocuronium RSI. Time permitting, administration of rocuronium should be followed by a saline flush. |

| Citation(s): | Ishigaki S, et al. Saline flush after rocuronium bolus reduces onset time and prolongs duration of effect: A randomized clinical trial. Anesth Analg 2015 Nov 23; [e-pub]. (http://dx.doi.org/10.1213/ANE.000000000001094) |