A Case of Delayed Sequence Intubation in a Pediatric Patient With Respiratory Syncytial Virus

To the Editor:
Recent studies and reports have focused on improving safety during intubation by improving preoxygenation. A technique referred to as delayed sequence intubation has been described in which procedural sedation is used to facilitate preoxygenation in patients who resist initial attempts. This procedure involves dissociation with ketamine as the agent of choice to maintain both hemodynamics and the respiratory drive. Here, to our knowledge, we describe the first case of this technique being applied to the pediatric patient.

A 16-month-old Hispanic girl with no significant medical history presented to the emergency department with 1 day of fever, nasal congestion, and cough. She was tachycardic to 160 beats/min and febrile to 39.4°C, had a normal respiratory rate, and had an oxygen saturation of 95% on room air. The respiratory examination result was benign, with no wheezing, distress, or use of accessory musculature. She had a positive respiratory syncytial virus antigen. Her breathing status remained good, and she was deemed stable for outpatient management with antipyretics and a course of steroids, and return precautions appropriate to her respiratory condition. Rapid streptococcal testing was also ordered, and the culture came back positive. On a follow-up call, the patient seemed stable and received a prescription for amoxicillin.

Two days later, the parents brought the patient back in for difficulty breathing. She was severely dyspneic on examination, retracting suprasternally and intercostally, and grunting, with nasal flaring. Her color was ashen, and oxygen saturation was 90% on room air. She was febrile, tachycardic to about 170 beats/min, and tachypneic to about 60 breaths/min. She had minimal response to needle pokes but was distressed at even the placement of nasal cannula oxygen. With nasal cannula, oxygen saturation improved to 93%, but after a nebulizer treatment with albuterol, there was no change in her work of breathing. Her blood gas result showed slight respiratory alkalosis and pCO₂ of 28 mmHg. It seemed unlikely that the disease process was going to resolve in the coming hours, so the decision was made that she needed to be intubated for oxygenation and to decrease the work of breathing.

Because she was still nearly hypoxemic, we focused on preoxygenation. She was agitated by attempted application of a nonrebreather facemask. We proceeded with delayed sequence intubation, with a dose of ketamine at 2 mg/kg. She rapidly dissociated, and we applied a facemask over her nasal cannula. Oxygen saturations improved during 2 minutes to 99%. With her rate of breathing, it was clear that she had appropriately denitrogenated as well. Rocuronium, 1 mg/kg, was injected and breathing efforts rapidly ceased. We maintained nasal cannula oxygen for apneic oxygenation during the next 60 seconds. She was intubated on first pass of direct laryngoscopy with a Cormac/Lehane grade 1 view of the cords. Postintubation, the patient desaturated to 93% and required titration of positive end expiratory pressure and oxygen concentration. She was transferred to the Children’s Hospital and lost to follow-up.

We present this case as a use of delayed sequence intubation to show that the technique is beneficial not only in agitated or combative adults but also in agitated and fearful pediatric patients who may not tolerate facemasks. This procedure may significantly benefit the patient and intubator in terms of preoxygenation and denitrogenation, allowing greater time during intubation without using a bag-valve-mask device and risking aspiration.

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**IMAGES IN EMERGENCY MEDICINE**

*Images in Emergency Medicine* (continued from p. 275)

**DIAGNOSIS:**

Cutaneous tattoo reaction. Tattoo reactions are most commonly associated with red ink but can be seen in any color. Relatively little regulation of tattoo ink composition exists, and a single color can contain varying amounts of dyes and metals. Mercury is a known irritant, but reactions to ink lacking mercury are not uncommon. Tattoo reactions are most commonly allergic, inflammatory, and infectious, with estimated complication rates of 2% to 3%. Symptoms of cutaneous reactions may range from itching and edema to an exfoliative dermatitis, and lesion biopsy may be needed to differentiate the true underlying cause. Treatment of tattoo reactions and other complications differs with the underlying cause. Systemic or topical steroids are often prescribed for noninfectious cutaneous reactions, with variable success. Severe skin reactions may require excision of the tattoo and underlying tissue.

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**REFERENCES**