Pediatric Out-of-Hospital Intubations: Experience of a Single EMS Agency

Katherine Bakes, MD

Success rates were high, but this study leaves more questions than answers.

In a retrospective study of pediatric (<13 years) prehospital paramedic airway management in King County, Washington, investigators assessed the incidence and outcomes of intubation attempts during a 6-year period. Overall, 299 calls (0.05% of all calls) involved attempted pediatric intubation, 51% with rapid sequence intubation. Individual paramedics averaged no more than one pediatric intubation every 2.6 years. Twenty-five percent of patients died at the scene, and 27% of transported patients died in the hospital. Indications for intubation included cardiac arrest (44%) and neurologic diagnoses (19%; most commonly status epilepticus).

First-attempt success rate was 66%. Bodily fluids interfering with laryngeal view was the most common reason for intubation difficulty (33%). Overall, 97% of intubations were reported successful. Serious complications occurred in 11% of patients, and included peri-intubation cardiac arrest, endotracheal tube dislodgement during transport, injury to the respiratory tract, and bradycardia requiring intervention. Nineteen percent of patients had unrecognized mainstem bronchus intubation.

Comment: There are multiple concerns with this study besides the intrinsic bias of self-reporting. Considering the rate of pediatric intubation complications in studies utilizing video review, (NEJM JW Emerg Med Nov 2012 and Ann Emerg Med 2012; 60:251), it is hard to believe that outcomes would be better in the uncontrolled out-of-hospital setting. Next, despite being the standard for tube placement confirmation, end tidal CO₂ was not used in 31% of intubations. Maybe most worrisome, in 50 of the 75 children who died in the field, intubations could not be confirmed as successful, because either the tube was removed before autopsy or autopsy reports were missing. Finally, the number of children with status epilepticus as an indication for intubation (not a treatment of choice) and number of emergency department extubations (9%) points to clinical decision-making errors, and it is inconceivable that anyone can maintain procedural competency with one intubation every 2.5 years.

This study should raise the alarm for King County, Washington, and prompt immediate evaluation of paramedic pediatric intubation policies. Paramedics should use bag-valve-mask to manage pediatric airways and transport children to the nearest hospital for definitive airway management.

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