Site-Level Variance for Adverse Tracheal Intubation-Associated Events Across 15 North American PICUs: A Report From the National Emergency Airway Registry for Children

Goals/Objectives:

The investigators hypothesized that site-level variance exists in the prevalence of tracheal intubation–associated events and that site characteristics may affect outcomes.
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Methods/Inclusion:

Tracheal intubation quality improvement data were collected in 15 PICUs from July 2010 to December 2011 using a National Emergency Airway Registry for Children with robust site-specific compliance. Tracheal intubation–associated events and severe tracheal intubation–associated events were explicitly defined a priori. The investigators analyzed the association of site-level variance with tracheal intubation–associated events using univariate analysis and adjusted for previously identified patient- and provider-level risk factors.
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Major Findings:

Analysis of 1,720 consecutive intubations revealed an overall prevalence of 20% tracheal intubation–associated events and 6.5% severe tracheal intubation–associated events, with considerable site variability ranging from 0% to 44% tracheal intubation–associated events and from 0% to 20% severe tracheal intubation–associated events. Larger PICU size (> 26 beds) was associated with fewer tracheal intubation–associated events (18% vs 23%, \( p = 0.006 \)), but the presence of a fellowship program was not (20% vs 18%, \( p = 0.58 \)). After adjusting for patient and provider characteristics, both PICU size and fellowship presence were not associated with tracheal intubation–associated events \( (p = 0.44 \) and \( p = 0.18 \), respectively). Presence of mixed ICU with cardiac surgery was independently associated with a higher prevalence of tracheal intubation–associated events \( (25% \text{ vs } 15%; \ p <0.001; \ \text{adjusted odds ratio}, \ 1.81; \ 95\% \ CI, \ 1.29–2.53; \ p = 0.01) \). Substantial site-level variance was observed in medication use, which was not explained by patient characteristic differences.
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Conclusions:

Substantial site-level variance exists in tracheal intubation practice, tracheal intubation–associated events, and severe tracheal intubation–associated events. Neither PICU size nor fellowship training program explained site-level variance. Interventions to reduce tracheal intubation–associated event prevalence and severity will likely need to be contextualized to variability in individual ICUs patients, providers, and practice.