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Introduction

- Unplanned postoperative intubation (UPI) extends duration of recovery, increases cost of hospitalization, and can affect morbidity and mortality.
- Children with preexisting neurologic disorders are at greater risk of UPI due to poor muscle coordination, respiratory muscle dysfunction, impaired functional status, and multiple preoperative co-morbidities.

Methods

- Conducted a retrospective cohort study using the National Surgical Quality Improvement Program for Pediatrics database to identify children who underwent inpatient orthopedic procedures between 2012 and 2017

Results

- Study cohort included 51,941 children who underwent inpatient orthopedic surgery, of whom 16,304 had a neurologic comorbidity
- Cumulative **incidence of UPI** was **0.1%** among children **without neurologic comorbidity** and **1.2%** among those **with neurologic comorbidity** (P<0.001)
- Impaired cognitive status** was the strongest independent predictor of UPI (hazard ratio: 6.31; 95%CI: 4.34, 9.17, P<0.001)

Preoperative neurologic comorbidity is associated with unplanned postoperative intubation.

References:

- Cheon EC, Palac HL, Paik KH, et al. Unplanned, Postoperative Intubation in Pediatric Surgical Patients: Development and Validation of a Multivariable Prediction Model. *Anesthesiology*. 2016;125(5):914-928.
- Eisler LD, Hua M, Li G, Sun LS, Kim M. A Multivariable Model Predictive of Unplanned Postoperative Intubation in Infant Surgical Patients. *Anesth Analg*. 2019;129(6):1645-1652.

Table 1. Univariable and multivariable analyses of the association between neurologic comorbidity and unplanned re-intubation.

	Number of events/N	Cumulative incidence at day 30 following surgery, in %	Unadjusted	
			HR(95%CI)	P-value
Any neurologic comorbidity				
No	26/35637	0.1	Reference	
Yes	198/16304	1.2	11.03(7.30,16.67)	<0.001
CNS abnormality				
No	139/45777	0.3	Reference	
Yes	85/6164	1.4	3.07(2.34,4.05)	<0.001
Seizure disorder				
No	112/46998	0.2	Reference	
Yes	112/4943	2.3	6.00(4.58,7.85)	<0.001
Cerebral palsy				
No	111/45298	0.2	Reference	
Yes	113/6643	1.7	4.67(3.58,6.10)	<0.001
Impaired cognitive status				
No	44/40991	0.1	Reference	
Yes	180/10950	1.6	10.42(7.46,14.55)	<0.001
Neuromuscular disorder				
No	88/43891	0.2	Reference	
Yes	136/8050	1.7	5.38(4.08,7.08)	<0.001

In the adjusted analysis, we controlled for age at the time of surgery, sex, history of prematurity, presence of a tracheostomy, chronic lung disease, congenital malformation, presence of a cardiac risk factor, hematologic disorder, malignancy, previous cardiac surgery, gastro-intestinal disease, year of operation, and surgical complexity index.

Discussion

- UPI is a critical target area for intervention to improve pediatric orthopedic surgical outcomes
- Preoperative neurologic comorbidity is associated with longer hospital length of stay and increased cost for the patients
- These associations underscore the need to accurately identify children with neurologic comorbidity for targeted perioperative risk mitigation