

Differential diagnosis and treatment of agitation in the pediatric pacu: Reliability and validity of nurses' observations

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Introduction: Recent studies describe a 10-30% incidence of agitation in children during emergence and recovery (1,2). Identified risk factors for agitation include young age and surgical procedure, and potential etiologies include pain and the use of certain anesthetics. Studies to date suggest that agitation in the child may indicate a number of underlying causes, making its differential diagnosis and subsequent management challenging for care providers in the postanesthesia care unit (PACU). To date, no studies have addressed the reliability of nurses' observations of agitated children, nor the appropriateness and efficacy of treatment decisions for these patients. This observational study was therefore undertaken to evaluate the interrater reliability of a commonly used agitation scale, and to describe and evaluate the assessments and interventions used in the care of agitated children.

Methods: With IRB approval and informed consent, assessment and treatment of agitation by nurses were studied over a 3 month period. Trained observers identified children in the PACU who exhibited agitated behavior and scored agitation as 1=mild, 2=moderate, or 3=severe. Recorded data included: agitation onset and end times, pharmacologic and non-pharmacologic interventions and their timing, and details about the child's age, weight, surgery, anesthesia care, and outcomes. Nurses independently scored agitation and recorded their opinion of the primary etiology of the agitation, as well as secondary, or tertiary etiologies, if any. Demographic data such as yrs of experience and areas of expertise were recorded by the nurses prior to the onset of the study.

Results: 21 nurses were studied during their care of 194 agitated children. 76% of nurses had a bachelors' degree, 70% had >15 yrs of experience, and 60% >5 yrs in the pediatric PACU. The children were 66% male, aged 3.9 ± 3.6 yrs, and mostly healthy (86% ASA I-II). 75% had undergone a procedure associated with pain. The intraclass correlation coefficient between observers' and nurses' agitation scores was 0.86, and exact agreement ranged from 49% (moderate) to 85% (severe); Kappa=0.533. Agitation subsided in <20 mins for 61% of children, and lasted > 1 hr in 4%. The table presents the primary suspected etiologies, the 1st, 2nd, and 3rd interventions and the overall efficacy of the intervention. In 4% of cases the nurse did not know what caused the agitation. Agitation ended after the first intervention in 57% of cases, and in 7% did not end after a 3rd intervention. The most effective interventions overall included reuniting with a parent (42%) and medication (31%).

Primary Etiology	1 st , 2 nd , 3 rd Interventions (% cases)			
	[% cases in which this treatment was effective overall]			
	Medication (analgesic/anxiolytic)	Reunite with Parent	Comfort Measures Only	Others*
Pain (27%)	68%/ 40%/8% [68%]	6%/ 27%/6% [24%]	22%/na/na [7%]	4%/2%/4% [1%]
Anxiety (25%)	21%/23%/4% [18%]	58%/31%/3% [79%]	21%/na/na [3%]	na/10%/na [0%]
Anesthetic Agent (11%)	48%/18%/5% [18%]	29%/50%/9% [71%]	19%/na/na [6%]	5%/5%/na [5%]
Respiratory (2%)	33%/66%/66% [0%]	na	33%/na/na [0%]	33%/na/33% [66%]**

* Includes various interventions, i.e., feeding child, removing IV, antiemetics, airway management etc.

** Airway management effective as a first intervention; opioid reversal effective as a 3rd intervention; 1 case agitation continued beyond discharge to ICU setting.

Discussion: Findings from this study identify the difficulties in assessing and treating agitation due to its multifactorial etiology. Experienced nurses most frequently identified pain and anxiety as the source of agitation, and, in these cases, most often selected initial interventions that were effective. Data further demonstrate good interrater reliability of a commonly used agitation scale, supporting its use in quantifying severity and evaluating response to interventions.

References:

1. Voepel-Lewis T, et al. Anesth Analg 2003
2. Cole JW, et al. Paediatric Anaesthesia 2002