May 4th, 12:30 PM - 12:45 PM

Evaluation of a modified pre-medication algorithm for non-emergent intubation in a neonatal intensive care unit

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Background:

The use of pre-medication for elective non-emergent intubation in neonates and infants has been suggested to minimize physiologic instability, decrease oral/pharyngeal trauma and decrease time and attempts to successful intubation. A pre-medication algorithm including the use of Fentanyl + Atropine was modified to include a higher dose of fentanyl with addition of muscle relaxant and benzodiazepine in a level IV neonatal intensive care unit.

Objective:

The objective of this study was to compare first attempt success of intubation pre- vs post-modification of the pre-medication algorithm.

Methods:

This is a single site retrospective chart review. Data were collected on patients ages 0 days to 12 months admitted and undergoing non-emergent endotracheal intubation in the Children's Mercy Hospital Intensive Care Nursery (ICN) between January 1, 2015-March 31, 2019. Patients were excluded if intubation was performed by personnel other than ICN providers. Data were analyzed using the Chi Square and Cochran-Mantel-Haenszel tests for discreet / continuous and ordered variables respectively.

Results:

151 patients were identified with a total of 239 non-emergent, pre-medicated intubation events occurring during the study period. There were no differences in post-menstrual age (p=0.659), weight at intubation (p=0.921) or gender (p=0.773) between the two groups. There were more airway anomalies (12.4% vs 4.1%, p=0.009), more intubation events during 1st week of life (51.5% vs 39.2%, p=0.005) and more 1st attempts by neonatal fellows (52.1% vs 38%, p=<0.001) in the post- vs pre-modification groups. Compliance with the pre-medication algorithm improved in the post-modification group (39.5% vs 20.3%, p=0.002). First attempt success increased from 43% to 52% but was not statistically significant (p=0.16). The use of a muscle relaxant increased from 3.1% to 63.7% (p <0.001) and cumulative fentanyl dose increased from 1 mcg/kg to 2 mcg/kg (p<0.001) in the post-modification group.

Conclusion:

Compliance with the algorithm and use of muscle relaxants improved post-modification but did not affect overall first attempt success. A higher number of first attempts by trainees may have influenced the first attempt success rate post-modification.