Sleep Disordered Breathing as a risk factor for Emergence Delirium in pediatric ambulatory surgery.

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Background

- Emergence delirium (ED) covers a broad spectrum of behavioral disturbances seen in children following emergence from anesthesia
- ED in the ambulatory setting can be quite distressing and may blemish the entire perioperative experience. Furthermore, dealing with ED in the post anesthesia care unit (PACU) places enormous burden on the nurses, is time consuming and often delays the time parents are reunited with their children after surgery and it may substantially prolong PACU stay
- Several putative risk factors for ED have been described. Many of these have focused on anesthetic agents. However, a priori identification of patient-level risk factors may help the provision of personalized perioperative care
- Given that abnormal sleep behavior (snoring, vocalization and thrashing around) are features of sleep disordered breathing (SDB), we hypothesize that children with SDB may demonstrate features consistent with ED.

Limitations

- Although data was prospectively collected, this was a secondary analysis hence detailed characterization of phenotype specific for ED were unavailable.
- ED was recorded as a categorical variable so it was impossible to compare grades of severity of delirium.
- Diagnosis of SDB was entirely clinical and because symptoms were combined, possibility of misclassification bias exists

Objective

- Describe the incidence of ED in patients undergoing elective ambulatory surgery
- Explore whether history consistent with SDB is significantly associated with PACU emergence delirium.

Methods

- We utilized data from an on-going prospective observational study of pediatric postoperative pain among ambulatory surgical patients. Present analyses focused on under-ten children.
  - SDB defined by presence of one or more of the following: history of OSA diagnosis, habitual snoring (loud snoring on at least 3 consecutive days) or witnessed cessation of breathing during sleep
- Primary outcome variable was PACU emergence delirium measured by the Pediatric Anesthesia Emergence Delirium Scale (PAED)
- Perioperative variables were compared between the exposed and control groups using Chi-squared test for categorical or t-test for continuous variables. Logistic regression analysis was used to calculate the adjusted odds of ED.

Results

- Among 661 children 217 (32.8 %) had a preoperative history consistent with SDB
- Mean age of study subjects was 8.4±3.1yr
- ED was documented in 44 (6.7%) patients
- The incidence of ED was statistically significantly higher among the SDB group (p=0.01 and this was independent of presence of documented moderate to severe pain
- In bivariable analysis, severe obesity (p=0.03), mask induction (p=0.013), and intraoperative sevoflurane (p=0.04) were significantly associated with ED
- Interestingly we found intraoperative use of dexmedetomidine was associated with higher unadjusted odds of ED in our subjects (OR = 3.9, 95%CI=1.25-12.61; p=0.01)
- On the other hand, IV induction (p=0.01) and intraoperative use of Propofol (p=0.008) were associated with decreased rates of ED
- Multivariable logistic regression analysis adjusted for age and the preceding variables indicates that SDB (p=0.04), severe obesity (p=0.05; increasing arousal pain score (p=0.001) were independent predictors of ED in our study cohort. Dexmedetomidine (p=0.14) was no longer a predictor in the adjusted model

Conclusion

- Among children undergoing elective outpatient operations, SDB diagnosis is an independent predictor of ED. Mechanisms underlying this finding deserve further elucidation but could be related to an underlying similarity between native sleep behavior and general anesthesia in children with SDB
- We agree with previous investigators that recovery pain appears to be inextricably linked with ED.

References