INCIDENCE OF ANESTHETIC RELATED COMPLICATIONS IN CHILDREN WITH SLEEP DISORDERED BREATHING FOLLOWING ADENOTONSILLECTOMY

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Objective: To review the incidence and nature of anesthetic related complications following pediatric adenotonsillectomy over a two year period at a tertiary medical center.

Introduction: Over the past decade, there has been a trend towards outpatient procedures. In general, research has shown that outpatient adenotonsillectomy is safe in children1. There remains a concern in certain populations for increased risk of adverse events, in particular young children with sleep disordered breathing (SDB)2.

This creates a management dilemma for practitioners performing this procedure. What is the ideal observation period for children with sleep disordered breathing to capture post operative anesthetic complications? Mitchell et al. suggested that an observation period of four hours is adequate in children less than three years of age3. Meanwhile, Lalakea et al. showed that observation for 2.5 hours was appropriate to capture all events in a broader age range (mean 6.2 years)4. Our study was designed to evaluate the incidence, nature and timing of adverse events in children undergoing adenotonsillectomy at our institution to better elucidate the ideal observation period needed in these children.

Methods: An institutional review board (IRB) approved this two year retrospective chart review at a single tertiary institution which included all children undergoing adenotonsillectomy.

Clinical variables including age, BMI, indication for adenotonsillectomy, and tonsil and adenoid grade were recorded. Co-morbidities of asthma, prematurity, and other disorders placing patients at risk for respiratory compromise were also recorded. The incidence, timing and nature of all adverse events were reviewed. Adverse events were defined as oxygen desaturation below 90%, requirement of oxygen supplementation including continuous positive airway pressure and mask ventilation, re-intubations, and insertion of nasopharyngeal airway.

Comparisons were made between the SDB group and non-SDB group as well as between patients with adverse events and those without adverse events using the standard t-test and chi-squared test. Specifically, the timing of adverse events was evaluated among the SDB and non-SDB groups.

Results: There were 264 patients identified with adequate information available for analysis in 248 patients (Table 1).

When comparing the groups with and without SDB, the only significant variable was tonsil and adenoid grade. Tonsil and adenoid grade was larger in the SDB group. After comparing groups with and without adverse events, the only significant variable was length of PACU stay. PACU stay was longer in the adverse event group (Table 2).

There were 27 (10.9%) total adverse events of which 92.6% were desaturations (Table 3). There were no re-intubations and the majority responded to stimulation (chin lift, placement of nasal trumpet, and suctioning). When comparing the timing of adverse events, 85.7% occurred within 30 minutes of leaving the OR in the non-SDB group. In the SDB group, 94.7% of the adverse events occurred within 30 minutes (Table 4). The timing of adverse events ranged from zero minutes to 143 minutes following surgery. All events occurred prior to leaving the PACU.

Discussion: Our study demonstrated a low rate of anesthetic related complications in children undergoing adenotonsillectomy, regardless of the indication. This is comparable to previous studies1. There was no significant difference in the number of adverse events following anesthesia in children with or without SDB. There was also no difference in the number of adverse events in children with prematurity, asthma, or co-existing disorders including various congenital defects and syndromes.

The majority of the adverse events occurred within the first 30 minutes postoperatively for patients with and without SDB. There was one outlier in each group. A patient with asthma and no other co-morbidities had an event at 65 minutes in the SDB group. Another patient had two events (123 minutes, 143 minutes) in the non-SDB group. This patient had a history of cerebral palsy and seizure disorder. This was the only patient to develop a respiratory event that required monitoring in the PICU.

Previous studies have shown that observation periods ranging from 2.5 to 4 hours following surgery is appropriate to capture all adverse events in non-complicated patients. This was confirmed by our study as all initial events fell within a 2.5 hour time frame.

As the indication for adenotonsillectomy shifts towards SDB, there is a need to determine the appropriate postoperative care for these patients5,6. In our study, an observation period of 2.5 hours after surgery appears to be adequate to capture all adverse events in children with SDB, but larger prospective studies are needed to confirm these findings.

Conclusion: There was a low incidence of adverse events in all children undergoing adenotonsillectomy with the majority occurring within 30 minutes postoperatively. There was no difference in the rate of adverse events in children with and without SDB.

References: