

Does Intraoperative Administration of Dexmedetomidine Cause Bradycardia After Tonsillectomy?

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Abstract

Objectives: Intraoperative use of dexmedetomidine has increased in tonsillectomy due to its lack of respiratory depression compared to opioids and maintenance of the airway reflex. With increased use of dexmedetomidine at our institution, we have also noticed an increase in post-tonsillectomy bradycardia. We seek to determine whether intraoperative dexmedetomidine use in tonsillectomy is associated with postoperative bradycardia and if so, whether the bradycardia requires cardiology workup.

Study design: Retrospective cohort study.

Methods: Medical charts of pediatric patients who underwent tonsillectomy or adenotonsillectomy at Nationwide Children's Hospital were reviewed. Children with history of cardiac pathology or beta blocker use, as well as patients who were not admitted for inpatient monitoring, were excluded from the study.

Results: 1084 patients were originally included in the study. Only 921 patients qualified for the study based on exclusion criteria. Of the 371 patients who received dexmedetomidine, 33 patients experienced post-tonsillectomy bradycardia (33/371=8.9%) within 24 hours of surgery. Of the 550 patients who did not receive dexmedetomidine, 33 patients experienced post-tonsillectomy bradycardia (33/550=6.0%). For the dexmedetomidine post-op bradycardia group, 4 of 33 patients underwent EKG that did not reveal underlying cardiac pathology. For the non-dexmedetomidine post-op bradycardia group, 5 of 33 patients underwent EKG that did not reveal cardiac pathology. No patients with post-op bradycardia in either group required other cardiology interventions or follow-up.

Conclusions: Post-tonsillectomy bradycardia is not associated with intraoperative use of dexmedetomidine in the pediatric population. The bradycardia is transient and clinically insignificant, and therefore, obviates the need for additional cardiology interventions and follow up.

Educational Objectives

1. Readers should be able to understand that dexmedetomidine use in tonsillectomy was not associated with higher rates of post-operative bradycardia.
2. Asymptomatic postoperative bradycardia likely does not require further cardiology work-up.

Background

- Adenotonsillectomy (ADT) has become the first-line treatment for pediatric OSA.¹
- Respiratory distress is one of the more worrisome complications in the immediate postop period after undergoing ADT.
- Postop opioid usage may increase the risk of respiratory distress after ADT, therefore it is preferable to limit the use of opioids.²
- There has been an increased usage of dexmedetomidine as part of anesthetic care in patients undergoing tonsillectomy, as this may lead to decreased postoperative opioid usage.³
- Dexmedetomidine is a selective α_2 agonist with resultant decreased central sympathetic output and with bradycardia as a known side effect.
- Anecdotally, there has been a recent increase in the incidence of postoperative bradycardic events recorded in our post-tonsillectomy patients admitted to the pediatric hospital overnight. We hypothesized that this recent increase in bradycardic events was related to the increased intraoperative usage of dexmedetomidine.

Methods

- This was a retrospective cohort study of pediatric patients who were admitted overnight after undergoing tonsillectomy or ADT between January 2013 and June 2013 at Nationwide Children's Hospital in Columbus, OH.
- Criteria for requiring overnight observation in the hospital: children less than 3 years of age, patients in the 90th percentile in weight, diagnosis of OSA based on polysomnography and those with symptoms of OSA in conjunction with adenotonsillar hypertrophy.
- Exclusion criteria: children with a cardiac pathology, history of beta blocker use, as well as patients who were not admitted for inpatient monitoring.
- Statistical analysis was performed using SAS version 9.4 (SAS Institute Inc., Cary, NC).

Results

- A total of 921 patients were included in this study. 371 patients received dexmedetomidine during their procedure, while 550 patients did not.
- A total of 66 patients experienced bradycardia while being monitored overnight. 50% (n=33) of the patients that experienced bradycardia had received dexmedetomidine during surgery, while the remaining 50% did not.

- Nine bradycardic patients received EKGs, however none showed any cardiac pathology or required further workup.
- **Use of dexmedetomidine did not significantly correlate with an increased risk of postop bradycardia.** However, performing certain procedures simultaneously, older age, and decreased body weight were associated with bradycardia.

Multivariable Logistic Regression Model for Bradycardia After Tonsillectomy

	OR	95% CI	p
Dexmedetomidine (Yes vs. No)	1.43	0.85-2.39	0.18
Age in years	1.11	1.03-1.20	0.01
Weight for age percentile*	0.89	0.82-0.97	0.007
Bilateral inferior turbinate intramural coblation and outfracture	2.71	1.45-5.05	0.002
Direct laryngoscopy and bronchoscopy	3.31	1.01-10.87	0.048

*The reported odds ratio is for a 10 unit increase in weight for age percentile

Conclusions

- The intraoperative usage of dexmedetomidine did not correlate with the increased incidence of postoperative bradycardia in our patients admitted overnight after undergoing tonsillectomy.
- There was a significantly increased incidence of bradycardia in patients of older age and lower body weight as well as patients undergoing either inferior turbinate coblation or direct laryngoscopy with bronchoscopy. The reason for this association is not clear at this time.
- There were a total of 66 patients with reported bradycardia overnight in this cohort. Nine of these patients had an EKG performed, all of which were normal. Per protocol at our hospital, all EKGs are reviewed by a cardiology fellow. None of these patients required further workup or intervention.

References

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