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Research Article

Peri and Intraoperative Dexmedetomidine with Infiltration of Local Anesthesia in Peritonsillar Bed during Adenotonsillectomy, a Retrospective Review, Enhance Pediatric Patient Recovery after Surgery (ERAS)

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Abstract

Pediatric patients with obstructive sleep apnea present a challenging situation for the pediatric anesthesiologist and otolaryngologist [4,10]. Patients with obstructive sleep apnea have been found to be more sensitive to the effects of opioids and benzodiazepines, both in the respiratory depressant and the analgesic effects. Dexmedetomidine [7,8] with infiltration of local anesthetic in peritonsillar bed have been exploited to enhance patient recovery and patient satisfaction after Tonsillectomy and Adenoidectomy.

Keywords: *Dexmedetomidine; Tonsillectomy; Adenoidectomy*

Background

Enhanced Recovery After Surgery (ERAS), consists of a multimodal patient care, starting from the preoperative surgical and anesthesia approach, and going into the intraoperative and postoperative care, to the point to reduce body stress, improve organs function, and nutrition [3,5,6] as well as to standardize analgesic regiment. The combination of all these actions and care are strategic for an early patient mobilization.

In the last decade, tonsillectomy and adenoidectomy in the children population have been the most frequent surgical procedure in USA, to help to decrease obstructive sleep apnea (OSA) sensibly among pediatric patients.

The adjuvant effect of local anesthetic infiltration in the tonsillar bed by the surgeon and the use on Precedex (Dexmedetomidine) both intranasal as pre -op medication and intravenous during the anesthesia case, has sensibly decreased the percent of volatile anesthetics (Sevoflurane) [1] and opioids requirement intra and post-op, allowing fast recovery and early discharge from PACU [8,9].

Methods

Prior to data collection approval from our institution's internal review board for this retrospective review was obtained (IRB HM20005468). Patients age 0 - 17 who underwent adenotonsillectomy from 2010 - 2015 under the pilot protocol had their records

reviewed, and control group of patients comprised of patients who underwent adenotonsillectomy by a different surgeon not utilizing the pilot protocol. We have excluded patients with concurrent otolaryngology procedures as Myringotomy and Tubes, Turbinate cautery, and direct laryngoscopy. Patient records were reviewed for use of intranasal and intravenous Dexmedetomidine in conjunction with infiltration of local anesthetic in the peritonsillar bed by the surgeon. This protocol is used by a single practicing otolaryngologist and a single practicing anesthesiologist at our institution. Preoperative data including demographics, indication for adenotonsillectomy were collected as well as intra- and post- operative data and medication utilization. Patient demographics are shown in table 1.

	Pilot Patients (%)	Control Patients (%)
Age		
0 - 2	7 (9.2%)	0 (0%)
2 - 12	65 (85.5%)	83 (89.2%)
13 - 17	4 (5.3%)	10 (10.8%)
Gender		
Male	40 (52.6%)	43 (46.2%)
Female	36 (47.4%)	48 (51.6%)
Obstructive Sleep Apnea		
OSA	64 (84.2%)	83 (89.2%)
No OSA	12 (15.8%)	10 (10.8%)
Race		
Caucasian	43 (56.6%)	30 (32.2%)
African American	28 (36.8%)	43 (46.2%)
Hispanic	5 (6.6%)	12 (12.9%)
Other	0 (0%)	8 (8.6%)

Table 1: *Demographics.*

Medication	Pilot Protocol	Control
Intranasal Dexmedetomidine (mcg/kg)	1.4	0.1
Intraoperative Fentanyl (mcg/kg)	0.7	1.2
Intraveous Dexmedetomidine (mcg/kg)	0.5	0.28
Intraoperative Propfol (mg/kg)	3.1	2.60
Intraoperative 0.25% Bupivacaine (cc)	2.7	0
Intraoperative Acetaminophen IV (mg/kg)	10.0	10.51
Intraoperative Dexamethasone (mg/kg)	0.4	0.34
End Tidal Sevoflourane (excluding induction)	1.6	2.0

Table 2: *Pre- and intra-operative medications (average amount).*

Protocol

Protocol is begun approximately 30 - 45 minutes prior to planned induction with the administration of 2 mcg/Kg Dexmedetomidine via the intranasal route using a micro-atomizer. Once in the operating room the patient is induced using sevoflurane and oxygen/nitrous mixture. An IV (Intravenous catheter) and ETT (Endo Tracheal Tube) are then placed and General anesthesia maintained using a mix of air and sevoflurane at 1.5%, reaching a 2L flow, in addition of 0.2 - 0.5 mg/kg intravenous Dexmedetomidine. All patients are given 0.5 mcg/kg dexamethasone intraoperatively to a max of 10 mcg per request of out otolaryngology team. Patients are also given IV acetaminophen 15 mg/kg and ondansetron 0.1 mg/kg intraoperatively. Post-operatively patients are given standing orders for ibuprofen and acetaminophen per os, in the PACU.

Results

Percentage of patients who had obstructive sleep apnea were similar between pilot protocol and control groups. Intraoperatively patients in pilot protocol received less Fentanyl and had a lower average end tidal sevoflurane level. Patients aged 2 - 12 who underwent pilot protocol as compared to control group received fewer doses of opiates and ibuprofen during their hospital stay (Chart 1). Rates of readmission, bleeding were similar between control and pilot protocol groups. No reintubations were noted in either the Dexmedetomidine or control group.

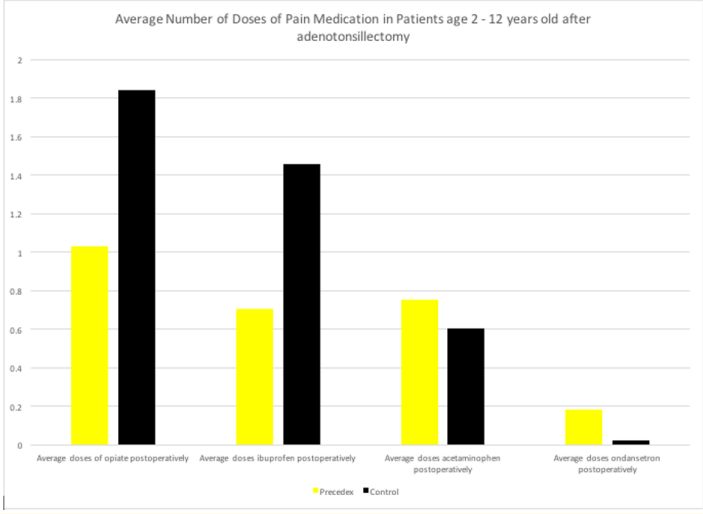

Chart 1

Discussion

The statistic study clearly showed that the analgesic effect achieved by the peritonsillar infiltration of local anesthetic in combination with the anesthesia protocol used is safe and successful. The decreased usage of narcotics both intra- and post- operatively, facilitating an early discharge home of a comfortable patient. We have achieved with our general anesthesia multi modal approach strategy, a fast recovery and great patient outcome.

Conclusion

The perioperative and intraoperative, use of Dexmedetomidine in combination with the peritonsillar local anesthetic infiltration by the surgeon has shown rewarding results on pediatric patient outcome, after Tonsillectomy and Adenoidectomy. We have embraced this anesthetic technique hoping to improve pain post op, reintubation, safety, and reducing PACU time. The realization of an ERAS path creation, using the strategy described is our great satisfaction, because clearly our little patients are benefit greatly by it. We will continue our clinical study on the ERAS protocol for tonsillectomy to eliminate completely the use of opioids and find an alternative molecule to infiltrate the peritonsillar bed at the best and for longer time.

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