Intratracheal Lidocaine and Postoperative Sore Throat at Providence Sacred Heart Medical Center and Providence Holy Family Hospital

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Background

Postoperative sore throat (POST) is a common side effect from general anesthesia (GA) and has a prevalence of 14.4-50%.[1] The experience of POST contributes to patient discomfort during recovery from surgery. The etiology of this is thought to be from tracheal mucosal erosion from the cuff of the endotracheal tube (ETT), trauma from intubation, coughing and bucking, and friction between the ETT and the tracheal mucosa during general anesthesia.[2] Risk factors shown to contribute to the development of POST include, but are not limited to, elderly age, smoking history, patient positioning, ETT cuff pressure, and movement of ETT during procedure.[2,3] The presence of POST after surgery can affect patient comfort during the post-operative recovery period and ultimately, impact patient satisfaction.

Methods

- A retrospective, observational, EPB project was conducted at Providence Sacred Heart Medical Center and Providence Holy Family Hospitals.
- CIRC approval and IRB exemption was obtained.
- A HIPPAA compliant REDCap database was used to securely store deidentified extracted data. No PHI was collected.
- The outcome of post-operative sore throat was assessed.
- Exposure to various modalities of intra-tracheal lidocaine was assessed.
- Surgical patients undergoing elective general anesthesia with endotracheal tube from January 1 to December 31 of 2019 were included.
- Exclusion criteria: Non-ETT general anesthesia with age <18
- An a-priori power analysis revealed 785 records would power results (1-β=0.80, α=0.05, Df=1, W=0.1).
- Univariate analysis was done on categorical and continuous data.
- Bivariate analysis for POST and lidocaine was conducted and RR, CI, and chi-Square p-values were reported.
- Binary logistic regression analysis was performed.

Findings

Table 1. Demographic and clinical characteristics (*N*=1500)

	POST No (*n*=1182)		POST Yes (*n*=318)		
	Mean	**StDev**	**Mean**	**StDev**	**P-Value**
Age	54.38	17.29	56.00	17.12	0.14
BMI*	30.66	7.54	31.58	8.28	0.06
Case Duration	100.82	54.46	127.11	83.33	<0.05
	Count	**Percent**	**Count**	**Percent**	**P-Value**
Facility					
PSHMC*	711	47%	268	18%	<0.05
PHFH*	471	31%	50	3%	
Gender					
Female	729	49%	189	13%	0.47
Male	453	30%	129	9%	
Smoker	193	13%	39	3%	0.35
Videoscope	407	27%	121	8%	0.23
Multiple positions	308	21%	163	11%	<0.05
IT lidocaine*	169	11%	60	4%	0.04
Paralytic	912	61%	293	20%	<0.05
ETT Size*					
6.5	17	1%	8	3%	0.18
7	447	38%	120	38%	0.98
7.5	205	17%	58	18%	0.71
8	195	16%	64	20%	0.13
8.5	6	1%	5	2%	0.05
Airway Attempts					
1	1029	87%	272	86%	0.48
2	49	4%	13	4%	0.96
3	17	1%	5	2%	0.86

* BMI: Body Mass Index; PSHMC: Providence Sacred Heart Medical Center; PHFH: Providence Holy Family Hospital; IT lidocaine: Intratracheal lidocaine; ETT: Endotracheal Tube

Table 2. Risk reduction of intratracheal lidocaine

	RR*	**95% CI***	**P-Value**
4% LTA	0.94	0.87-1.02	0.14
2% Gel	0.75	0.52-1.05	0.02

* LTA: laryngotopical tracheal anesthesia; RR: Relative Risk; 95% Confidence Interval

Figure 1. Rates of post-operative sore throat at PSHMC & PHFH

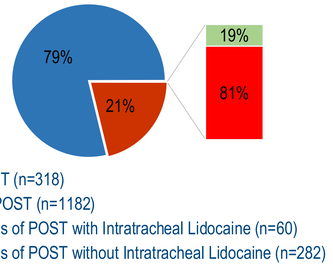
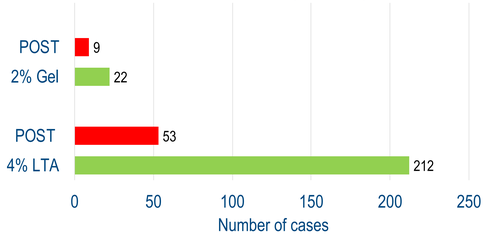


Table 3. Independent risk factors for POST

	OR*	**95% CI***	**P-Value**
ENT Service Line*	3.72	2.47-5.62	<0.01
Multiple Positions	3.01	2.27-3.99	<0.01
Succinylcholine Use	3.28	1.90-5.68	<0.01
Rocuronium Use	1.87	1.16-3.02	<0.01
Succ + Roc*	0.35	0.17-0.73	0.005

*OR: Odds ratio; 95% Confidence Interval; ENT: Ear nose and throat; Succinylcholine & Rocuronium administration reduced odds of POST

Figure 2. Rates of intratracheal lidocaine administration and POST by modality



Discussion

This retrospective observational EBP study shows that rates of POST among patients receiving GA with an ETT are 21% (*n*=318). Of the POST group, 81% did not receive any form of intratracheal lidocaine (*n*=282). The most common form of intratracheal lidocaine used was via laryngotracheal topical anesthesia (LTA). Limitations of this study include small sample size, limited and subjective reporting of POST, and inconsistent documentation of intratracheal lidocaine. Multiple studies support the use of intratracheal lidocaine to prevent the development of POST after general anesthesia with an ETT.[1]

This EBP project shows that there was a statistically insignificant reduction of POST with the use of 4% LTA. However, this study may generate hypothesis about LTA use, given limited research published on the use of LTA's for POST. Lidocaine gel 2% showed statistically significant reduction in POST. Only one occurrence of intra-cuff lidocaine was documented, showing no reduction in POST, however there is strong research evidence showing the effectiveness of intra-cuff lidocaine on the reduction of POST.[4] This study may inform further hypothesis about group characteristics of patients receiving intratracheal lidocaine.

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