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A Comparative Study of Alkalinized Lignocaine and Placebo for Inflating Endotracheal Tube Cuff to Reduce Postoperative Cough, Sore throat and Hoarseness of Voice

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Abstract

Background: Smooth emergence from anaesthesia is necessary for preventing potential respiratory and hemodynamic instability. Coughing on the endotracheal tube during emergence can lead to tachycardia, hypertension, laryngospasm and hypoxemia. The objective of the study was to compare alkalinized 2% lignocaine with 0.9% saline for inflating endotracheal tube (ETT) cuff to reduce post-operative complications like cough, sore throat, hoarseness of voice, nausea and vomiting. **Materials And Methods:** This was a prospective randomized double blinded study conducted in tertiary care setup over a period of 3 months. We included 60 patients in age group of 18 to 60 years posted for elective surgeries lasting less than 120 minutes under general anaesthesia. Patients were randomized using computer generated randomization table into either group – Group A (Alkalinized 2% Lignocaine) or Group B (0.9% saline) with 30 patients in each group. Before induction, the anaesthesia provider was given a 20 ml syringe with either 0.9% saline or alkalinized 2% lignocaine. Anaesthesia provider was blinded to drug administration at the time of intubation. The ETT cuff was inflated with 0.9% saline or alkalinized 2% lignocaine in sufficient volume to establish a cuff pressure to prevent air from leaking during positive pressure ventilation. After extubation, the presence or absence of outcomes such as cough, sore throat, and hoarseness of voice was observed at 1, 6 and 12 hours post operatively. **Results:** Demographic data, baseline characteristics and duration of anaesthesia were comparable among study groups. Incidence of sore throat at one hour, 6 hour, 12 hours postoperatively was significantly reduced in Group A compared to Group B. Throat pain, coughing, hoarseness of voice were common in Group B. **Discussion:** In this study, the primary outcomes postoperative cough and sore throat showed a statistically significant decrease in 2% alkalinized lignocaine group when compared to Group B. Postoperative hoarseness of voice also showed statistically significant relation in Group A with no incidence at first hour of postoperative period. **Conclusion:** This study showed the significance of use of intracuff alkalinized 2% lignocaine in reducing the incidence of cough, sore throat during the postoperative period. This could be attributed to endotracheal tube acting like a semipermeable membrane through which alkalinized lignocaine diffuses out and exert its local effect on tracheal mucosa.

Keywords: *Alkalinized 2% lignocaine, endotracheal tube, post-op sore throat*

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Introduction

Smooth emergence from anaesthesia is necessary for preventing potential respiratory and hemodynamic instability. Coughing on the endotracheal tube during emergence can lead to tachycardia, hypertension, laryngospasm and hypoxemia. The objective of the study was to compare alkalinized 2% lignocaine with 0.9% saline for inflating endotracheal tube (ETT) cuff to reduce post-operative complications like cough, sore throat, hoarseness of voice, nausea andvomiting.

Aim And Objectives

This study was to compare Alkalinized 2% Lignocaine (2% lignocaine mixed with 8.4% sodium bicarbonate) with 0.9% Saline for inflating endotracheal tube cuff to reduce postoperative complications like cough, sore throat, of voice, nausea and vomiting.

Materials And Methods

A prospective double-blind study in patients undergoing elective surgical procedures in Government Thiruvarur Medical hoarseness College and Hospital

- Sample size – 60 patients

Inclusion criteria

- Patient's age > 18 years and < 65 years
- American Society of Anaesthesiologists grade I and II
- Mallampati Grading I and II
- General Anaesthesia in surgery lasting for less than 120 minutes

Exclusion criteria

- Anticipated difficult intubation
- American Society of Anaesthesiologists grading III and IV
- Mallampatti Grading III and IV
- Previous upper airway surgeries

Patients eligibility assessed during the pre anaesthetic check-up

- 60 patients – divided randomly into 2 groups - **Group A** – 2 % lignocaine plus 8.4% sodium bicarbonate - (*Experimental group*); **Group B** – 0.9 % Saline (*Control group*)

On arrival to OT, standard anaesthetic monitoring was applied to all patients. Before induction, the Anesthesia provider was given a 20ml syringe with either 0.9% saline or alkalinized lignocaine. The anesthesia provider was blinded to the drug administration. At the time of intubation, Group A received intracuff lidocaine and Group B group received intracuff saline.

Volume must be sufficient to establish a cuff pressure to prevent air from leaking during positive pressure ventilation. Outcome analysis was done at 1, 6 and 12 hours post-operatively.Statistical analysis was done using SPSS Software version 24.

Results

In our study, the incidence of sore throat was less when intracuff alkalinized lignocaine was used rather than saline. Throat pain, coughing, hoarseness were common in control group.

Table 1: Incidence of cough, sore throat and hoarseness among experimental and control group

Study parameters	**Mean±SD**	
	Group A	**Group B**
Coughing at 1 hour	1.25±0.52*	3.06±0.68

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Coughing at 6 hour	1.375±0.76*	3.17±0.49
Coughing at 12 hour	3.65±0.57*	3.75±0.50
Sorethroat at 1 hour	1.00±0.38*	3.38±0.58
Sorethroat at 6 hour	1.12±0.50*	3.26±0.60
Sorethroat at 12 hour	2.73±0.63	3.15±0.69
Hoarseness at 1 hour	1.37±0.34*	3.48±0.45
Hoarseness at 6 hour	1.00±0.33	3.25±0.52
Hoarseness at 12 hour	1.25±0.60	3.12±0.59
Value are expressed in mean ±SD. P< 0.05 is considered significant		

Discussion

Endotracheal intubation is the mode to secure airway in many of the surgeries requiring General Anaesthesia[4]. Previous studies suggested that liquid medium inside cuff reduces pressure related complications[5]. In our study, Postoperative cough showed a significant decrease in group A when compared to group B. In Group A, cough was not significant in the first 6 hours and it increases by 12.1% at 12 hour which is significantly different from group B, where the incidence is 48.5% at 1 hour. Incidence of sore throat at 1,6 and 12 hour and hoarseness of voice at 1 hour was significantly reduced in Group A when compared with Group

B. The statistically significant reduction of cough and sore throat can possibly be attributed tothe diffusion kinetics of liquid medium (alkalinized lignocaine)

Summary And Conclusion

In this study, intracuff alkalinized 2% lignocaine was found to be superior to saline in reducing emergence coughing and sore throat during the postoperative period. This could be attributed

to endotracheal tube acting like a semipermeable membrane through which alkalinized lignocaine diffuses out and exerted its local effects on tracheal mucosa.

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