

# Effect of Endotracheal Tube Lidocaine Instillation in Prevention of Smokers Emergence Coughing: Sample of Iraqi Patients Undergoing Emergency Appendectomy

Mohammed Jawad<sup>1</sup> and Malath Azeez alsaady<sup>2</sup>

- 1 Hilla Teaching Hospital, Babylon General Directory of Health, Hilla, Iraq
- 2 Pharmacology department, Dentistry College, Babylon University, Iraq

## Abstract

**Background:** Cough reflex is normal protective reflex but cause various complication during emergence from general anaesthesia especially to smokers.

**Objective:** To evaluate the effect of instillation 0.5% lidocaine through the endotracheal tube to reduce the smokers coughing during emergence from general anaesthesia

**Methods:** 300 patients of both sex enrolled in this study to have open emergency appendectomy. Patients divided into 4 groups. 50 non-smoker patients as control group. 50 smokers patient received no per operative efforts to reduce the incidence of postoperative cough, 100 smokers patient received 20 ml of 0.5% lidocaine dropped slowly into the endotracheal tube throughout the procedure, and 100 smoker patient received 20 ml normal saline dropped slowly into the endotracheal tube throughout the procedure. At the end of surgery, after extubation, the patient was considered to have cough if develops irritating cough or have 3 or more bucking.

**Result:** Incidence of cough significantly decreased ( $p \leq 0.05$ ) among smoking patients treated with lidocaine in relation to patients treated with normal saline, smokers without intervention.

**Conclusion:** Instillation of lidocaine to endotracheal tube is effective method in reduction of smokers cough during emergence from general anaesthesia.

**Keywords:** Anaesthesia; Cough; Lidocaine

**Corresponding author:**  
Malath Azeez alsaady

✉ malathalsaady@yahoo.com

Malath Azeez alsaady, Pharmacology department, Dentistry College, Babylon University, Iraq.

**Tel:** 9647801216020

**Citation:** Jawad M, Alsaady MA. Effect of Endotracheal Tube Lidocaine Instillation in Prevention of Smokers Emergence Coughing: Sample of Iraqi Patients Undergoing Emergency Appendectomy. J Intensive & Crit Care 2016, 2:2.

**Received:** May 04, 2016; **Accepted:** May 12, 2016; **Published:** May 19, 2016

## Introduction

Cough reflex important to preserve upper airways from foreign objects and accumulation of mucus however, postoperative cough, is uncomfortable, distressing sequelae after tracheal intubation. Coughing affect surgery results, causing potentially dangerous patient movements, and increase wound bleeding [1, 2]. It postulated that these effects are because of irritation and inflammation of the airway mucosa by endotracheal tube [3]. Cigarette smokers known to have respiratory problems during induction of anaesthesia with increased incidence of laryngospasm and cough during extubation as the integrity of epithelia lost by smoke irritation [4]. Anesthetic providers aim to increase patients

comfort and reduce coughing complications. Using simple, easy, cheap and acceptable methods with negligible side effects like local anesthetics application provide patients comfort. Many studies have demonstrated the effectiveness of using local anesthesia topically or intravenously, and corticosteroids or opioids to reduce smoker cough during or post extubation [5-7] this study performed to evaluated whether endotracheal tube (ETT) dropping of lidocaine through the tube was superior to saline in blunting emergence coughing of smokers.

## Patients and Methods

This study done in Al-Hayat private hospital in Babil-Iraq from March 2014 to April 2015. The study designed to measure

the incidence of post-operative cough in patients undergoing emergency open appendectomy and Al-Hayat hospital Ethical Committee approved the design of the study.

Informed consents taken from 300 patients scheduled to have open emergency appendectomy. Patients divided into 4 groups,

- 50 non-smoker patients
- 50 smoker patients received no efforts to reduce the incidence of postoperative cough,
- 100 smoker patients received 20 ml of 0.5% lidocaine dropped slowly into the endotracheal tube throughout the procedure, and
- 100 smoker patients received 20 ml normal saline dropped slowly into the endotracheal tube throughout the procedure.

Patients considered smokers if they smock regularly 20 cigarettes or more daily for more than single year and patients smoke less than 20 cigarettes or less than one year excluded from the study.

All patients received standardized anesthesia using IV line, sleeping dose of thiopental sodium ranging from 4-6 mg/kg with 0.5 mg/kg ketamine for analgesia. Neuromuscular block performed using 0.5 mg/kg atracurium. Patients intubated and ventilation controlled using 100% oxygen and 1.5% halothane using tidal volume of 6 ml/kg, at a rate of 12/min. All patients received paracetamol 10 mg/kg with tramadol 1.5 mg/kg for postoperative pain relief. Reversal of neuromuscular block by 40 miq/kg neostigmine with 20 miq/kg atropin At the end of surgery, after extubation, the patient was considered to have cough if develops irritating cough or have 3 or more bucking of cough from the time of extubation to 8 hour post operatively.

### Method of installation

Plain lidocaine 2% diluted by distilled water to 20 ml. The resultant concentration is 0.5%. Immediately after intubation 2 ml dropped into the tube and ventilation started then 2 ml dropped every 2 minutes through the CO<sub>2</sub> sampling port so ventilation not interrupted and CO<sub>2</sub> sampling interrupted minimally, normal saline used was 20 ml and installation was similar to that of lidocaine.

### Statistical analysis

The data presented using descriptive statistics such as mean and standard deviation for continuous variables and frequency and percentage for categorical variables. Associations between categorical variables were assessed using Chi-square tests. Comparison of continuous outcomes among groups performed by ANOVA at level of significance of  $p \leq 0.05$  using IBM spss statistics version 22.

### Drugs

Xylocain 2% (lidocaine Hcl) for instillation and nerve block. ASTRA USA.

## Results

This study reveal significant increase in cough incidence among smokers without intervention as compared with non-smokers,

in addition to that significant decrease found in cough incidence ( $p \leq 0.05$ ) among patients treated with lidocaine in relation to patients treated with normal saline, smoker without intervention and non-smokers (**Tables 1 and 2**).

Normal saline treated smokers also, show significant reduction of cough incidence in relation to smokers without intervention (**Table 2**).

There were no significant differences of cough incidence ( $p \geq 0.05$ ) among gender in all groups, **Table 3**.

## Discussion

Coughing during emergence from general anesthesia is unwanted reflex that cause various undesirable complication [8]. This study found significant increase in cough incidence among smokers without intervention than non-smokers (**Table 2**). This finding goes with findings of other studies that state smoking exaggerate coughing reflex [9, 10] and could be explained by chronic smoking affect respiratory epithelia ranging from inflammation to dysplasia and this render respiratory epithelia to be more reactive to endotracheal tube insertion which cause stretch stimuli in the trachea. According to that chronic smokers should managed very carefully with modification of anesthetic technique; and that performed by adding lidocaine to endotracheal tube which, is efficient local anesthesia, cheap and available in Iraq and its efficiency in reduction of post-operative cough incidence proved in this study as compared with smokers without intervention and normal saline treated patients (**Table 2**).

We believed that lidocaine has dropped slowly through the endotracheal tube stabilize neural membrane of trachea and bronchi providing better local anesthetic effect to abolish the

**Table 1** Demographic data.

Groups	Gender		Age means $\pm$ SD	Total number patients
	male	female		
Smoker without intervention	23	27	33.76 $\pm$ 14.52	50
Non Smoker without intervention	27	23	34.12 $\pm$ 9.80	50
Xylocain treated smokers	50	50	31.95 $\pm$ 11.92	100
Normal saline treated smokers	42	58	35.101 $\pm$ 12.72	100

$p \geq 0.05$  no significant differences related to gender and age.

**Table 2** Incidence of cough among xylocain and normal saline treated smoking patients expressed by percentages.

	Non-smokers without intervention	Smokers without intervention	Xylocain treated group	Normal saline treated group
Cough	30%	86%*	35.2%**	59.6%**
No cough	70%	14%*	64.6%**	40.4%**

\* $p \leq 0.05$

\*\* $p \leq 0.05$  significant differences related to smokers without intervention group

**Table 3** Incidence of cough among groups related to gender.

Gender	Smoker without intervention		Xylocain treated group		Normal saline treated group	
	Cough	No cough	Cough	No cough	cough	No cough
Female	55.8% of (27)	42.9% of (27)	45.7% of (50)	51.6% Of (50)	55.2% of (58)	44.8% of (58)
male	44.2% of (23)	57.1% of (23)	54.3% of (50)	48.4% Of (50)	65% of (42)	34.1% of (42)

$p \geq 0.05$  no significant differences related to gender

local irritable effect of tube to the previously irritated mucosa of smokers. 20 ml volume chosen because the total dose given is far from toxicity and we think that it can well cover the irritated area of the bronchial tree, as well as, can liquefy the dry secretions in the tracheobronchial tree.

In spite of differences in lidocaine administration technique many studies prove the effect of lidocaine in reduction of post-operative cough incidence of smokers like Laís Navarro and colleagues [11] that use lidocaine by intra cuff injection and

Caranza et al. [12] who prove the effect of nebulized lidocaine in reduction of induction complication in smokers. On the other hand, Smitha Elizabeth George et al. [13] study show that endotracheal lidocaine instillation in the dose of 1 mg/kg does not prevent cough at extubation if given 20–30 min before extubation; this finding disagree with current study results which could be explained by different type of instillation technique and surgical operation.

Our study found no significant differences in cough incidence among gender of all study groups and it seems normal finding, as there are no physiological or anatomical variation among sexes.

As conclusion, endotracheal dropping of lidocaine is effective technique in reduction of cough incidence of smokers during emergence from general anesthesia.

## Acknowledgment

The authors thank resident anesthesiologists for their assistant in observation and recording during study period. Thanks to Al-hayt hospital committee for their cooperation.

## References

- 1 Sumathi PA, Shenoy T, Ambareesha M, Krishna HM (2008) Controlled comparison between betamethasone gel and lidocaine jelly applied over tracheal tube to reduce postoperative sore throat, cough, and hoarseness of voice. *Br J Anaesth* 100: 215-218.
- 2 Aouad MT, Al-Alami AA, Nasr VG, Souki FG, Zbeidy RA, et al. (2009) The effect of low-dose remifentanyl on responses to the endotracheal tube during emergence from general anesthesia. *Anesth Analg* 108: 1157-1160.
- 3 Jea YL, Byung GL, Hye YP, Nan SK (2012) Sufentanil infusion before extubation suppresses coughing on emergence without delaying extubation time and reduces postoperative analgesic requirement without increasing nausea and vomiting after desflurane anesthesia. *Korean J Anesthesiol* 62: 512-517.
- 4 Schwilk B, Bothner U, Schraag S, Georgieff M (1997) Perioperative respiratory events in smokers and non-smokers undergoing general anaesthesia. *Acta Anaesthesiol Scand* 41: 348-355.
- 5 Lebbi B, Bargaoui A, Romdhane M, Messaoudi A, Gabsia A, et al. (2014) Lidocaine reduces endotracheal tube associated side effects when instilled over the glottis but not when used to inflate the cuff: a double blind, placebo-controlled, randomized trial. *La tunisie medicale* 92: 29-33.
- 6 Nishino T, Hiraga K, Sugimori K (1990) Effects of i.v. lignocaine on airway reflexes elicited by irritation of the tracheal mucosa in humans anesthetized with enflurane. *Br J Anaesth* 64: 682-687.
- 7 Dilip K, Neelima T, Meena S, Arun Kumar (2014) Attenuation of circulatory and airway responses to endotracheal extubation in craniotomies for intracerebral space occupying lesions: Dexmedetomidine versus lignocaine. *Anesthesia: Essays and Researches* 8: 78-82.
- 8 Gonzalez RM, Bjerke RJ, Drobycki T, Stap elfeldt WH, Green JM, et al. (1994) Prevention of endotracheal tube-induced coughing during emergence from general anesthesia. *Anesth Analg* 79: 792-795.
- 9 Erskine RJ, Murphy PJ, Langton JA (1993) Effect of stopping smoking on upper airway reflexes. *Br J Anaesth* 70: 478.
- 10 Bergren DR (2001) Chronic tobacco smoke exposure increases cough to capsaicin in awake guinea pigs. *Respir Physiol* 126: 127-140.
- 11 Laís N, Rodrigo L, Andressa A, José B, Jeffrey C, et al. (2012) The effect of intracuff alkalized 2% lidocaine on emergence coughing, sore throat, and hoarseness in smokers. *Rev Assoc Med Bras* 58: 248-253.
- 12 Caranza R, Raphael JH, Nandwani N, Langton JA (1997) Effect of nebulized lidocaine on the quality of induction of anaesthesia in cigarette smokers. *Anaesthesia* 52: 849-852.
- 13 Smitha EG, Georgene S, Binu SM, Denise F, Grace K (2013) Comparison of the effect of lignocaine instilled through the endotracheal tube and intravenous lignocaine on the extubation response in patients undergoing craniotomy with skull pins: A randomized double blind clinical trial. *J Anaesthesiol Clin Pharmacol* 29: 168-172.