Egyptian Journal of Anaesthesia (2016) **32**, 13–19

HOSTED BY

ELSEVIER

Egyptian Society of Anesthesiologists

Egyptian Journal of Anaesthesia

www.elsevier.com/locate/egja
www.sciencedirect.com

Review Article

Effect of small dose propofol or midazolam to prevent laryngospasm and coughing following oropharyngeal surgeries: Randomized controlled trial

Amira A. Shaban *

Department of Anaesthesia and Intensive Care, Faculty of Medicine for Girls, Al-Azhar University, Egypt

Received 10 June 2015; revised 14 September 2015; accepted 30 September 2015
Available online 28 October 2015

KEYWORDS

Propofol;
Midazolam;
Postextubation;
Laryngospasm;
Cough

Abstract *Objective:* To compare the effectiveness of small dose of propofol or midazolam in treating laryngospasm following extubation in adult patients undergoing oropharyngeal operations.
Methods: The study was conducted in Al-Zahra Hospital, Al-Azhar University, Egypt. One hundred and twenty adult patients, with age range 30–50 years, ASA physical status I–II, of either sex undergoing elective oropharyngeal surgeries under general anesthesia were randomly allocated to one of three equal groups ($n = 40$) using a computer generated randomization table. At extubation before suction, the patients in the three groups were administered intravenously propofol 0.8 mg/kg diluted in 20 ml (Group P) or midazolam 0.05 mg/kg diluted in 20 ml (Group M) or saline 20 ml as control group (Group C). The following parameters were recorded: hemodynamic changes (heart rate and mean arterial blood pressure), the frequency and severity of laryngospasm and cough were recorded before time of extubation and up to 5 min using four point scale.
Results: Compared with the control group, there was a significant decrease in the mean arterial pressure and increase in pulse rate in both groups after administration of the study drugs and up to 5 min after extubation, and this change was comparable and similar in both groups. During emergence and up to 5 min, the incidence and severity of postoperative laryngospasm and cough were significantly lower ($p < 0.05$) in both propofol and midazolam groups as compared to control group. The change in both propofol and midazolam groups was insignificant and comparable.
Conclusion: We conclude that intravenous administration of small dose of propofol or midazolam before tracheal extubation decreases the incidence and severity of laryngospasm and coughing in adult patients undergoing oropharyngeal surgeries.

* Address: Department of Anaesthesia and Intensive Care, Faculty of Medicine for Girls, Al-Azhar University, Egypt. Tel.: +20 1009956912.
Peer review under responsibility of Egyptian Society of Anesthesiologists.

http://dx.doi.org/10.1016/j.egja.2015.09.008

Contents

1. Introduction

Laryngospasm and airway complications such as coughing and oxygen desaturation are serious complications after tracheal extubation [1]. Laryngospasm is considered a physiological exaggeration of the glottis closure reflex. This complication is more frequent in the following:

i. Children.
ii. Patients with airway infection.
iii. Those undergoing manipulation of the airway.
iv. Those using specific anesthetics.
v. Those undergoing oral or pharyngeal surgeries, and
vi. Smokers [2].

Extubation complications such as bucking, breath holding, laryngospasm and pulmonary edema continue to be major problems for the anesthesiologist, especially in oral surgery, because at the end of surgery the mouth is full of secretions and mixed blood and there is edema of the tissues. Deep anesthesia will delay recovery while light plane may result in coughing, breath holding efforts of self removal of tube, laryngospasm, pulmonary edema [3], hypoxia and cardiac arrest [4]. There has been considerable research conducted on methods and drugs to prevent coughing during emergence such as extubation at a great anesthetic depth, the use of succinylcholine [5], topical lignocaine [6], aerosolized lignocaine [7], nitroglycerine [8], small dose of propofol [9], and magnesium [10]. These methods all come with advantages and disadvantages.

Propofol is used widely in clinical anesthesia, and it is known to be an inhibitor of airway reflexes [11]. It has been reported that single i.v. administration of a subhypnotic dose of propofol effectively prevents laryngospasm and coughing during emergence in children [12,13].

As laryngospasm is considered a life-threatening condition, it may increase the level of anxiety and in turn cause panic in most individuals; panic in turn triggers an episode of asthma, making this a vicious cycle, which can be broken by midazolam.

Therefore, we have performed this study in order to analyze the effects of small dose of propofol or midazolam on preventing laryngospasm and cough during the emergence from anesthesia following oropharyngeal surgeries.

2. Patients and methods

We designed a prospective, randomized, and controlled study using a computer–generated randomization table to evaluate the efficacy of small dose propofol or midazolam to prevent laryngospasm and coughing following oropharyngeal surgeries.

After approval from the local ethical committee, an informed written consent was obtained from 120 patients of American Society of Anesthesiologists (ASA) grade I & II, age range between 30 and 50 years, of either sex scheduled for elective oropharyngeal surgery (Uvulopalatopharyngoplasty (UPPP), Laryngoscopy with vocal cord surgery, Dental surgery, and Arytenoidectomy) under general anesthesia in Al-Zahra Hospitals, Al-Azhar University.

The duration of study was one year only from 2013 to 2014 and to get the unbiased results, the demographic matching was necessary. Hence, a sample size of 120 patients to get the preliminary trends was found to be feasible as shown in Fig. 1

Patients who received drugs such as lidocaine or a supplemental dose of narcotics before extubation were excluded from the study; patients of ASA grade III/IV, those above 60 years or below 12 years, and those with a full stomach were also excluded. Patients with a history of bronchial asthma, allergy especially chest, cardiovascular, or upper respiratory tract diseases, smokers and obese patients with BMI greater than 35 kg/m^2 were not enrolled in the study.

Patients were included in this study after a review of their preoperative history, clinical examination and full investigation recorded in their hospital charts. Sedative premedication drugs were not given to the patients. After arrival to the operation room, the patients were randomly divided into three equal groups (40 patients each) by using computer generated randomization table.

- *Control group (c):* saline 20 ml was given at the time of extubation before suction.
- *Propofol group (P):* Propofol 0.8 mg/kg diluted in 20 ml given intravenously at extubation before suction.
- *Midazolam group (M):* Midazolam 0.05 mg/kg diluted in 20 ml given intravenously at extubation before suction.

Upon arrival in the operating room, intravenous cannula was inserted and electrocardiogram, non-invasive blood pressure, pulse oximeter, and end tidal CO_2 were applied to all patients and their baseline vital signs were measured.

All patients were administered standard general anesthesia consisting of thiopental (4 mg/kg), fentanyl (1–2 μg/kg), and cisatracurium (0.15 mg/kg), administrated intravenously to facilitate tracheal intubation using the appropriate size of cuffed endotracheal tube. Anesthesia was maintained using 1–1.5% isoflurane in a mixture of oxygen and air at a ratio of 50:50. Ventilation was controlled mechanically and adjusted to maintain normocapnia (end tidal CO_2 30–35 mmHg). The vital data of the patients (noninvasive arterial blood pressure,