

Survey about the Extubation Practice among Anaesthesiologists in Kosovo

Nehat Baftiu^{*}, Islam Krasniqi, Kastriot Haxhirexha, Rudin Domi

Clinic for Anaesthesiology and Intensive Care, University Clinical Centre of Kosovo, Prishtina, Kosovo

Abstract

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***Correspondence:** Nehat Baftiu, Clinic for Anaesthesiology and Intensive Care, University Clinical Center of Kosovo, Kosovo. E-mail: nehatbaftiu@hotmail.com

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BACKGROUND: Tracheal extubations may be performed before or after awakening from anaesthesia. The advantage of extubation during anaesthesia may avoid all the unpleasant effects of fully awake extubation such as severe hypertension and tachycardia, malignant dysrhythmias, myocardial ischemia laryngospasm, and cough induced high intraocular and intracranial pressure.

AIM: To show the current practice of performing extubations in Kosovo, as well as the advantage and disadvantage in performing this procedure in an awake patient or inpatient in light anaesthesia.

MATERIAL: This study is conducted at the Regional Hospitals and the University Clinical Center of Kosovo during the year 2015. A questionnaire is given to the anesthesiologists to collect information about the techniques used for extubation, timing and management of extubation.

RESULTS: Based on this survey results that 86% of an anesthesiologist (71) extubate the patients when they are completely awake, while 14% of them (12) prefer to extubate the patients under light anaesthesia. From all anesthesiologists involved in this study, forty of them reported problems during extubation. Complications were related to airway, and they are treated by oxygenation and jaw support, but in rare cases, reintubation were performed.

CONCLUSION: Complications during extubation remain important risk factor while extubation during light anaesthesia can minimise some of them.

Introduction

Perioperative airway management includes taking care of both intubation and extubation. Airway management and mechanical ventilation during anaesthesia is a crucial daily practice of every anesthesiologist. To ensure a successful anaesthesia process, the anesthesiologist must create a plan how to conduct anaesthesia and airway management. It is recently reported that extubation period can face to the anesthesiologist perhaps more sharp complications compared with endotracheal intubation [1].

No guidelines exist regarding the best extubation technique or timing, to prevent the post-extubation complications. There are many potential complications which may occur during extubation including post-extubation respiratory failure

manifested by hypoxemia and/or hypercapnia, and cardiac disturbances including death. Minor complications are faced by the anesthesiologist as a laryngeal irritation (the incidence is reported up to 45%), sore throat and hoarseness (commonly in intubated patients for a long period or difficulty intubated trachea) occur in most intubated patients.

Difficult mask ventilation or difficult intubation can result in lips, mouth, or pharynx damage. It is reported even hypoglossal nerve damage, causing numb tongue 1 - 2 weeks after extubation [2]. The literature offers no significant convincing data on this topic.

The main aim of this study is to evaluate the extubation techniques related to the surgery procedures including extubation time, and patients are positioning as well. Secondly, the study tends to reveal all the complications after extubation, their incidence, and all treatment approaches.

Material and Methods

This study is conducted at the Regional Hospitals and the University Clinical Center of Kosovo during the year 2015. A questionnaire in Albanian language (native language) is given to the anesthesiologists who are working in Regional Hospitals in Kosovo and University Clinical Center of Kosovo. A total of 89 questionnaires were distributed to them, and they returned it after they completed the questionnaire. The modified questionnaire [3], was applied as a tick - box format with a dedicated space for further necessary explanations. The questionnaire included information about the gender, years of work as anesthesiologists, anaesthesia techniques used, and techniques used for extubation, the timing of extubation, management of extubation including patient position during extubation and if there were any complications during extubation in the last six months.

The last part dealt with the type of complications and management of these complications during extubation.

Results

A total 89 questionnaires were distributed, and 83 questionnaires were completed and returned (93% respond rate). The years of experience as anesthesiologist were included in this study. The mean value was 13 (range from 3 - 35 years). Ten of respondents (13%) were from Regional Hospitals of Kosovo and the others from University Clinical Center in the capital.

According to the data referred by anesthesiologists results that they extubate the patient either when is completely awake or under light anaesthesia 71 vs 12 (86% vs 14%). About 86% of respondents always use 100% of O₂ for 2 - 5 minutes before extubating, 36% of them occasionally use reversal agents, while aspiration during extubation is used by 89% of respondents, as summarised in Table 1.

Supine and head up position during extubation were used in elective surgery and at obese patients, but lateral left and lateral left with head down position were used significantly in emergency surgery patients.

Table 1: Airway management and extubation

	Always	Mostly	Occasion ally	Never
100% oxygen for 2-5 min before extubation	86%	14%		
Reversal agents	22%	42%	36%	
Aspiration	64%	25%	11%	

The trachea is always extubated in the operation theatre, and all patients are transferred extubated to the recovery room breathing oxygen. From all respondents, 40 reported problems during extubation. Table 2 demonstrates the positions of patients in the moment of extubation.

Table 2: Position(s) at extubation

	Head up	Supine	Lateral left	Lateral left and head down
Elective	32	44	4	2
Emergency	36	14	26	12
Obese	52	18	18	0

We observed and memorised all the reported complications after the patients were extubated. As shown in Table 3, the most common complication after extubation is a cough, desaturation, laryngospasm, and airway obstruction.

Table 3: Incidence of complications after the extubation

Complications	Nr	%
Coughing	80	45%
Breath holding	10	6%
Airway obstruction	12	7%
Laryngospasm	10	6%
Desaturation	26	15%
Inadequate reversal	16	9%
Apnoea	8	5%
Vomiting	4	2%
Aspiration	2	1%
Haemodynamic instability	8	4%
Total	176	100%

Complications were treated with oxygen therapy, jaw support, but in some cases, the medicaments were used significantly to treat the complication. In fourteen patients reintubation is undertaken because of due to difficulties in maintaining adequate respiratory (Table 4).

Table 4: Treatment methods of the complications

Treatment of complications	n
Oxygen	96
Jaw support	74
Propofol	26
Midazolam	2
Reversal drugs	30
Suxamethonium	8
Re-intubation	14

Discussion

The extubation can be performed before or after the patient regains consciousness. The main benefits of extubation in deep anaesthesia include minimising several side effects of sympathetic stimulation as hypertension, tachycardia, laryngospasm, cough, and increased intraocular and intracranial pressure. This would be beneficial when avoidance of the hemodynamic and respiratory reflexes to extubation is advisable (e.g. following certain intracranial, ophthalmologic, or thoracic surgical procedures). The principal disadvantage of

tracheal extubation during deep anaesthesia is the increased risk of upper airway obstruction and inadequate airway protection rendering the patient prone to pulmonary aspiration [1]. During the extubation sequence, the anesthesiologist should be careful to provide oxygen to the patient [4]. Extubation has been performed when the patient is either fully 'awake' or deeply anaesthetised. During awake extubation, the patient can maintain the airway patency. Deep anaesthesia extubation reduces the incidence of coughing, and hemodynamic perturbations due to sympathetic stimulation, but can be associated with increased likelihood of upper airway obstruction [30][31][32]. This extubation approach is applied in patients whom airway management is easy, and the gastric aspiration risk is not evident.

For all participants, 86% of them always use 100% O₂ before extubation; these were answers if they use 100% O₂ before extubation of the patient, which is in line with recommendations for patient extubation. Before extubation, the anesthesiologist can often increase FiO₂ to maximise oxygenation in case of failed extubation [19]. Recently has been reported that higher FiO₂ can induce postoperative atelectasis, but controversies exist [20][21]. In order to avoid unnecessary post-extubation hypoxia, a higher FiO₂ can be recommended [22][23][24][25][26].

Anesthesiologists use reversal agents for reversal of neuromuscular block in most of the patient. In patients at high - risk for extubation failure, incomplete reversal of muscle relaxation will contribute to, or even be the primary cause of upper airway obstruction after extubation. Therefore clinically adequate return of neuromuscular function following administration of muscle relaxants is essential. This can only be assured by using quantitative relaxometry [47]. If such a technique is not available, muscle relaxants must be antagonised by appropriate doses of acetylcholine esterase inhibitors or sugammadex while ventilation needs to be continued for 3 - 4 h after the last dose of an intermediately long-acting muscle relaxant. According to our data results, 89% of anesthesiologists perform tracheal aspiration always during the extubation. Suction must be smooth and ideally performed under direct laryngoscopy [27][28]. Special care must be taken if there is bleeding or clots in the airway. The suction must be carefully performed or even avoided because of increased risk of the airway and tracheal tree obstruction by blood [29]. In elective operations, extubation was more frequently performed in the supine and head up positions. In emergency surgery, the head up and left lateral position was usually chosen. In obese patients, however, most anaesthetists preferred a head up position before tracheal extubation. There is no consensus on the suitable patient's position during extubation, but ahead - up (reverse Trendelenburg) or semi-recumbent position may be preferred. The

anesthesiologist performed the obese patient's extubation in the head - up tilt because of benefits in airway monitoring and management. This position is accepted for the non - fasted patient [18, 48] as well. The trachea is always extubated in the operating room, and all patients are transferred extubated to the recovery room breathing oxygen. During extubation, the incidence of coughing was 45% of total complications, about 6% of patients were complicated with laryngospasm while desaturation represents 15% of all complications because is considered a major cause of upper airway obstruction. It may be provoked by sudden stimulation while the patient is in a light plane of anaesthesia, and by vocal cord irritation through secretions (e.g. saliva, blood, gastric content). Although suction of the oropharynx should routinely be performed, it must be performed while the patient is still deeply anaesthetised because any irritation of the vocal cords at a light plane of anaesthesia may provoke laryngospasm. Extubation during application of positive airway pressure is an additional means of removing secretions from around the vocal cords. This manoeuvre may, however, provoke coughing. If tracheal tube (TT) cuff pressure has been monitored and maintained at the recommended level, extubation without prior cuff deflation may be a further means of removing secretions from above the vocal cords during extubation [45]. If risk factors for the development of laryngospasm exist, extubation during deep anaesthesia should be considered. Patients being extubated during deep levels of anaesthesia are preferably placed in the lateral (and possibly slightly Trendelenburg) position to keep the vocal cords clear of secretions during emergence. Even that reversal agents were used in most of the patients, and most of the anesthesiologists reported that they extubate the patients always or mostly in awake or under light anaesthesia, 9% of complications were due to the inadequate reversal. It is important to highlight that in regional hospitals or University Clinical Center is not available equipment or tools for monitoring of the neuromuscular block and for neuromuscular block reversal. Oxygen is used mostly (n = 96) to treat the complications, then airway open techniques and reversal drugs including and propofol are drugs used mostly to treat the complications. Guidelines are designed to describe the actual practice on the topic and are evidence-based medicine helping the anesthesiologists to manage the life - threaten everyday issues [11][34][35][36][37][38][39][40][41]. None of the actually published guidelines addressed to the extubation approach [6][7][8][9][10][11]. The residency programs do not always deal with extubation which is, of course, one of the most important moments in anaesthesia. Extubation after anaesthesia differs from ICU extubation. Several events can occur after extubation [13][33][42][43], but outcomes are improved by planning, organization and communication [14][15][44].

Results of this survey show that complications during extubation remain important risk factor in the

management of anaesthesia, and in current practice in Kosovo" Usually the experience of the anesthesiologist is an important factor in avoiding complications of the extubations and not related if it is Regional Hospital or University Clinical Center.

Author contributions

Nehat Baftiu contributed to the original idea of the study, Islam Krasniqi collected data and analysed them, all authors contributed to the discussion section and manuscript preparation for submission.

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