Effectiveness of Mouthpiece Nebulization and Nasal Swab Stick Packing for Topical Anesthesia in Awake Fiberoptic Nasotracheal Intubation

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Objective: *To evaluate the effectiveness of using mouthpiece nebulization and nasal swab stick packing for topical anesthesia in awake fiberoptic nasotracheal intubation.*
Material and Method: *This was a prospective descriptive study of 30 patients with ASA I-II who underwent elective surgery and suspected of difficult intubation between March 2004 and June 2006. After 2% lidocaine 5 ml was nebulizated in a micronebulizer using oxygen 10 L/min as a driving gas through a standard mouthpiece and 10% cocaine 1 ml on cotton swab-stick was applied to the selected nostril for 15 min, fiberoptic nasotracheal intubation was done while the patient was awake. If the patient had severe gag or cough reflex, 1% lidocaine 5 ml per each time could be injected through the working channel of the fiberoptic bronchoscope. The descriptive statistics were calculated by using SPSS version 11.0.*
Results: *The success rate of awake fiberoptic nasotracheal was 100%. The mean duration of awake fiberoptic nasotracheal intubation was 119.0 $\pm$ 76.8 sec. The responses of the patient to instrumentation during 4 periods, i.e.: passing the endotracheal tube into the nose, passing the bronchoscope into the pharynx-larynx, passing the bronchoscope into the trachea-carina and passing the endotracheal tube into the trachea were, as follows: no response in about 53.3%, 63.3%, 23.3%,and 13.3%; mild pain or reflex in about 46.7%, 10%, 70%, and 86.7%; moderate pain or reflex in about 0%, 3.3%, 6.7%, and 0%; and severe pain or reflex requiring more local anesthetic in about 0%, 23.3%, 0%, and 0%, respectively. Despite complete topical anesthesia in the majority of the patients, two patients required 5 ml more 1% lidocaine and five patients required 10 mL more of the drug through the fiberoptic bronchoscope. There was no serious complication such as hypoxemia, arrhythmia. Twenty-four patients (80%) were satisfied with mouthpiece nebulization and nasal swab packing because they felt safe, did not have pain, and were comfortable; only three patients (10%) were dissatisfied because of numbness of the tongue and difficulty in swallowing; two patients (6.7%) had no comment; and one patient (3.3%) was unable to evaluate due to unplanned tracheostomy.*
Conclusion: *In the present study technique of topical anesthesia using 2% lidocaine 5 mL mouthpiece nebulization and 10% cocaine 1 mL soaked nasal swab stick packing is useful and safe for awake fiberoptic nasotracheal intubation in patients with suspected difficult intubation. 76.7% of the patient did not require more local anesthesia and 80% were satisfied with this technique.*

Keywords: *Nebulization, Awake fiberoptic nasotracheal intubation, Difficult airway, Topical anesthesia technique*

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The technique of awake fiberoptic nasotracheal intubation has been well established in the literature for managing predicted difficult airway which approximately occurs in 0.4-8% of all patients[1]. In addition to its high successful rate (98.8%)[2], especially in the first attempt, this technique allows the patient to maintain the tonicity of the airway muscles, providing a degree of safety that can be lost in anesthetized and paralyzed patients.

As for the use of fiberoptic endotracheal intubation in waking patients, its excellent topical anesthesia of the airway not only reduces respiratory

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reflex, cardiovascular stimulation, anxiety, pain but also enhances comfort and cooperation[3,4].

The Department of Anesthesiology at Chulalongkorn Memorial Hospital provides a training course in topical anesthesia of the airway and awake fiberoptic nasotracheal intubation[5] and the technique of topical anesthesia of the airway usually uses a nasal packing with 10% cocaine 1 mL on cotton swab-stick and transtracheal injection with 1% lidocaine 10 mL as a 3-in-1 block. The airway anesthetized with transtracheal injection was reported to be superior compared with the nebulization technique, due to its lower dose of local anesthetic[6-8] and providing better anesthesia of the vocal cords[7].

The transtracheal injection technique may be difficult or impossible in some patients with a huge neck mass, deep neck infection, superior vena cava obstruction, to position the needle because of anatomical distortion of the trachea or patients with bleeding tendency in whom transtracheal injection is prohibited[9]. Furthermore, the most distressing aspects of transtracheal injection include pain on injection and severe coughing with concomitant rising heart rate, blood pressure and intracranial pressure[10] and almost one-third of the patients undergoing transtracheal injection felt the procedure unpleasant[6,8]. Therefore, the nebulization technique could be one of the alternative techniques.

In several studies, nebulization technique of 4-5% lidocaine was used for topical anesthesia of the airway in fiberoptic bronchoscopy and awake fiberoptic intubation[11-14]. The present prospective study was performed to evaluate the effectiveness of airway topical anesthesia technique with lidocaine nebulization via mouthpiece and cocaine nasal packing for fiberoptic nasotracheal intubation (FNI) in terms of success, simplicity, and patients' satisfaction.

Material and Method

After approved by the ethics committee of the Chulalongkorn Memorial Hospital, the protocol was conducted in 30 patients of ASA physical status I-II who had signed up their informed consent forms. All patients who underwent elective surgical procedures under general anesthesia and was assessed at preoperative evaluation to be potentially difficult to intubate, difficult to ventilate or have signs of potentially failed tracheal intubation with direct laryngoscope such as; large mass at lip, base of tongue, gum, epiglottis, pyriform fossa, larynx and neck (including goiter); stridor, hoarseness; Mallampatic class 3; thyromental distance of less than 5 cm; and intercisor distance of less than 2 cm or have past history of difficult or failed tracheal intubations were selected for awake fiberoptic nasotracheal intubation (AFNI). Exclusion criteria were nasal problems, fracture base of skull, lower respiratory tract hypersensitivity (asthma, bronchitis), allergy to drugs used in the procedure (lidocaine, cocaine, and fentanyl), and bleeding tendency. No patient was premedicated prior to their arrival in the operating room.

In the operating room, an intravenous cannula was inserted. Automatic blood pressure, electrocardiography, pulse oxymetry monitor were attached and programmed to record every 5 min. The patients received atropine 0.01 mg/kg and fentanyl 1 mcg/kg intravenously.

The next step was aimed at achieving airway topical anesthesia prior to FNI. While the patient was sitting upright, topical anesthesia with 2% lidocaine 5 ml was nebulized in micronebulizer (model UNI-8900B) using oxygen 10 L/min as a driving gas through a standard mouthpiece (Fig. 1a) and 10% cocaine 1 mL on cotton swab-stick was applied to the selected nostril for 15 min (Fig. 1b).

FNI was performed by one of two experienced anesthesiologists. Conscious patients were asked to extend their neck, open their mouth, protrude their tongue, and breathe deeply through their mouth. Lubricated endotracheal tube (Portex soft seal; number 6.5 for male and number 6.0 for female) was inserted into the selected nostril about 7 cm. Fiberoptic broncho-

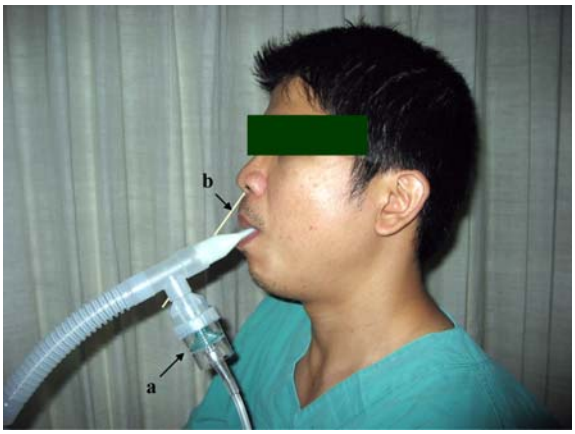

Fig. 1 Airway topical anesthesia
a. 2 % lidocaine 5 ml was nebulized in micronebulizer (model UNI-8900B) using oxygen 10 L/min as a driving gas through a standard mouthpiece for 15 min
b. 10% cocaine 1 ml on cotton swab-stick was applied to the selected nostril for 15 min

scope (Olympus LF-2, 3.8 mm) was introduced through the endotracheal tube, and then passed into the oropharynx, through the vocal cords, and into the trachea above the carina. The endotracheal tube was then slid off the fiberoptic bronchoscope. The endotracheal tube tip confirmed the position under direct vision approximately 3 cm above the carina then the endotracheal tube cuff was inflated. After successful FNI, thiopental 5 mg/kg, atracurium 0.5 mg/kg and general anesthesia were administered. During the FNI, if the patient had severe gag or cough reflex, 1% lidocaine 5-10 ml (5 ml per each time) would be injected through the working channel of the fiberoptic bronchoscope.

Data collections using a standardized report form were completed by the attending anesthesiologist and the patients, as follows:

1) Patient characteristics

2) The FNI time (the time from nasal insertion of the endotracheal tube till connection of endotracheal tube to the anesthetic circuit)

3) Patient's responses to instrumentation during 4 periods of FNI: a) endotracheal tube was inserted to nostril; b) fiberoptic bronchoscope in the pharynx used to find vocal cords; c) fiberoptic bronchoscope in the trachea used to find the carina; and d) endotracheal tube was passed into the trachea. The patient's responses were characterized into 4 grades (1 = no response; 2 = mild pain or reflex; 3 = moderate pain or reflex; and 4 = severe pain or reflex showing that more local anesthetic is required for completion of the procedure) as shown in Table 1.

4) Patient's satisfaction in topical anesthesia with lidocaine nebulizer and AFNI were evaluated at 24 h post-operation. The patient's satisfaction was scored in 11 scales (from -5 to 5, where -5 means very dissatisfied; 0 means no comment; 5 means very satisfied), including the reasons.

Sample size was determined by equation 1. Regarding to significance level is 0.05 (95% Confidence interval (CI), $Z_{\alpha/2} = 1.96$), successful intubation rate was 80% ($p = 0.8$, $q = 0.2$) and acceptable error of estimation is 0.15; then sample size was estimated that the minimum of 30 subjects would be needed.

$$\text{Equation 1} \qquad n = \frac{(Z_{\alpha/2})^2(p)(q)}{\Delta^2}$$

$$= \frac{(1.96)^2(0.8)(0.2) = 27.32}{(0.15)^2}$$

All statistical analysis was performed with SPSS version 11.0. The patient's response to instrumentation during the 4 periods, the patient's satisfaction

Table 1. Patient's responses to instrumentation during 4 periods as 4-point rating score

Patient's responses during	Score			
	1	2	3	4
Endotracheal tube was inserted to nostril	No response	Mild pain and showed some face expression	Moderate pain and showed marked face expression	Severe pain, scream and refused endotracheal tube insertion, more topical anesthesia requested
Fiberoptic bronchoscope in the pharynx used to find the vocal cords	No response	Mild gag reflex without disturbing bronchoscopic view of vocal cords	Moderate gag reflex with mildly disturbing bronchoscopic view of vocal cords	Severe gag reflex with loss of bronchoscopic view of vocal cords, supplement of 1% lidocaine 5 ml per each time required to complete the procedure
Fiberoptic bronchoscope in the trachea used to find the carina	No response	Mild cough reflex without disturbing bronchoscopic view of carina	Moderate cough reflex with mildly disturbing bronchoscopic view of carina	Severe cough reflex with loss of bronchoscopic view of carina and supplement of 1% lidocaine 5 ml per each time required to complete the procedure
Endotracheal tube was passed into the trachea	Easily performed in the first attempt without cough	Performed in the first attempt with mild cough	Moderate cough and success in second attempt	Severe difficulty performed and supplement of 1% lidocaine 5 ml required to complete the procedure

and all of qualitative data were expressed as number of the patient and percent. A quantitative data such as age, intubation time, dose of local anesthetics were expressed as mean ± SD, or median (range) where appropriate.

Results

In the present study, AFNI was attempted in 18 male and 12 female patients. Their average age was 41.7 y (ranged 20-75 y); their weight was 57.5 kg (ranged 40-75 kg); their height was 162.2 cm (ranged 145-175 cm); their median dose of lidocaine was 1.88 mg/kg (ranged 1.47-2.59); and their median dose of cocaine was 1.73 mg/kg (ranged 1.3-2.5) (Table 2). The airway problems, which tracheal intubations were known or considered to be difficult are listed in Table 3. Nineteen patients (63.3%) had a tumor mass in the oral cavity or the neck, seven patients (23.3%) had compound fracture mandible, two patients (6.7%) had temporomandibular joint ankylosis, and two patients (6.7%) had micrognathia. Four patients had a history of failed tracheal intubation with direct laryngoscopy and one patient planned tracheostomy. There was no serious complication such as hypoxemia, arrhythmia during the procedure.

The patients' response score to instrumentation is summarized in Table 4.

All 30 patients tolerated well to the nasal insertion of the endotracheal tube; 16 patients (53.3%) had no response, and 14 patients (46.7%) had mild pain and showed some facial expression.

Regarding patient's response to fiberoptic bronchoscope in the pharynx during identifying the vocal cords and passing bronchoscope through, 19 patients (63.3%) were calm and showed no response, three patients (10%) had mild gag reflex, one patient (3.3%) had moderate gag reflex, and seven patients (23.3%) had severe gag reflex with loss of bronchoscopic view of the vocal cords and required supplementary dose of lidocaine. Five of these patients (who needed more lidocaine) required two additional doses and two of them required only one dose.

Regarding patient's response to fiberoptic bronchoscope in the trachea during identifying the carina, seven patients (23.3%) were calm and showed

Table 2. Patients' characteristics (n = 30)

Patients' characteristics	mean ± SD (minimum-maximum)
Sex (Male:Female)[a]	18:12
Age (y)[b]	41.7 ± 16.7 (20-75)
Weight (kg)[b]	57.5 ± 8.0 (40-75)
Height(cm)[b]	162.2 ± 8.1 (145-175)
Total dose of lidocaine (mg/kg)[c]	1.88 (1.47-2.59)
Total dose of cocaine (mg/kg)[c]	1.73 (1.3-2.5)

[a] Data present as number of the male : female patient
[b] Data present as mean ± SD (minimum- maximum)
[c] Data present as median (minimum- maximum)

Table 3. Airway problems (n = 30)

Airway Problems	Frequency (Percent)
Carcinoma of mandible/gum/ tongue/epiglottis	8 (27.7)
Huge goiter	7 (23.3)
Compound fracture mandible	7 (23.3)
Temporomandibular joint ankylosis	2 (6.7)
Huge neck mass	3 (10)
Micrognathia	2 (6.7)
Arterio-venous malformation of lower lip	1 (3.3)

Data present as number of the patients (percent)

Table 4. Patient's response score to instrumentation (n = 30)

	1	2	3	4
Endotracheal tube was inserted to the nostril	16 (53.3%)	14 (46.7%)	0 (0%)	0 (0%)
Fiberoptic bronchoscope in the pharynx used to find the vocal cords	19 (63.3%)	3 (10%)	1 (3.3%)	7 (23.3%)
Fiberoptic bronchoscope in the trachea used to find the carina	7 (23.3%)	21 (70%)	2 (6.7%)	0 (0%)
Endotracheal tube was passed into the trachea	4 (13.3%)	26 (86.7%)	0 (0%)	0 (0%)

Data present as number of the patients (percent)
The patient's response score were characterized into 4 grades; 1 = no response
2 = mild pain or reflex, 3 = moderate pain or reflex, 4 = severe pain or reflex showing that more local anesthetic is required for completion of the procedure

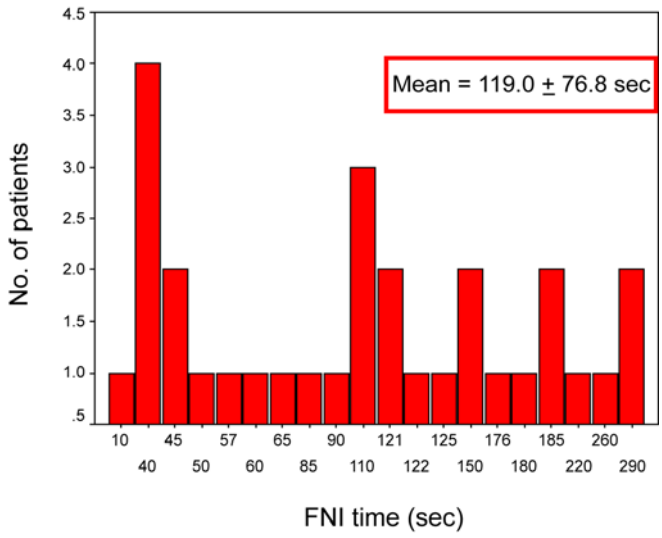

Fig. 2 The FNI time (the time from nasal insertion of the endotracheal tube till connection of in placed endotracheal tube to the anesthetic circuit) (n = 30)

no response, 21 patients (70%) had a mild cough, two patients (6.7%) had a moderate cough, and none could not tolerate nor required more lidocaine.

As the endotracheal tube was being passed into the trachea, four patients (13.3%) did not cough in the first attempt, 26 patients (86.7%) FNI experienced mild difficulty with mild cough but performed at the first attempt, none was performed on the second attempt or requested more local anesthesia or failed intubation.

All FNI were succeeded within 5 min (Fig. 2), the mean intubation time was 119.0 ± 76.8 sec (ranged 20-290 sec). The FNI was succeeded in 3 min in 24 patients (80%), 4 min in 3 patients, and 5 min in 3 patients. In five out of six cases whose FNI took the time longer than 3 min, their mouth was not sealed around the nebulizer mouthpiece during the preparation for nebulization, so that the topical anesthesia at the pharynx, larynx and trachea was inadequate and more local anesthetic was required twice for each patient. Another case had distortion of the vocal cords due to a large neck mass that obliterated the vocal cords, and endotracheal tube number 6.5 would not pass through, so the fiberoptic bronchoscope and endotracheal tube had to be changed into the smaller sizes (Olympus LF-TP, 2.6mm, and Micro-laryngeal tube number 4.0).

Evaluation of patients' satisfaction in topical anesthesia with lidocaine nebulizer for FNI was done in 29 patients because one patient was unable to be evaluated due to tracheostomy after the removal of a huge neck mass. The median value of patients' satisfaction to topical anesthesia with lidocaine via mouthpiece nebulization (Table 5, 6) was 4. Twenty-four patients (80%) liked and wanted to use this technique of topical anesthesia in the next FNI because they felt comfortable, safe, fine and not painful with this technique; whereas three patients (10%) felt it unpleasant and refused topical anesthesia with lidocaine nebulization in the next FNI because of feeling numbness sensation on their tongue, difficulty in swallowing, mild sore throat and mild irritation; while two patients (6.7%) had no comment.

The median value of patients' satisfaction to FNI (Table 7, 8) was 5. Twenty-three patients (76.7%) liked and wanted to have this technique in their next surgery because they felt safe, no pain, comfortable and not tired with this technique; whereas two patients (6.7%) felt it unpleasant and refused FNI in their next surgery because they could not swallow for a few hours, felt uncomfortable due to irritation of the instrument retaining in the throat, and suffered from pain in the nose; while four patients (13.3%) had no comment.

Discussion

In the present study, the authors topically anesthetized the anterior ethmoidal nerve and sphenopalatine ganglion by packing the selected nostril with 1 ml of 10% cocaine on cotton swab stick into the nasal cavity and anesthetized the pharynx, larynx and trachea with 5 ml of 2% lidocaine nebulized in a micronebulizer

Table 5. Patient's satisfaction score in technique of airway anesthesia (n = 30)

Patients' satisfaction score	Frequency (Percent) Technique of airway anesthesia
-4	2 (6.7%)
-3	1 (3.3%)
0 (no comment)	2 (6.7%)
2	1 (3.3%)
4	12 (40%)
5	11 (36.7%)
Unable to evaluate	1 (3.3%)

Data present as number of the patients (percent)

Table 6. Reasons of satisfaction and dissatisfaction in technique of airway anesthesia (the patient could answer more than 1 reason) (n = 30)

Reasons	Frequency Technique of airway anesthesia
Safe	12
Not painful	11
Comfortable	3
Fine	3
Numbness on tongue	3
Difficult in swallowing	2
Mild sore throat	2
Mild irritate	1

Data present as number of the patients

Table 7. Patient's satisfaction score in awake fiberoptic nasotracheal intubation (n = 30)

Patient's satisfaction score	Frequency (Percent) Awake fiberoptic nasotracheal intubation
-4	2 (6.7%)
0 (no comment)	4 (13.3%)
3	1 (3.3%)
4	9 (30%)
5	13 (43.3%)
Unable to evaluate	1 (3.3%)

Data present as number of the patients (percent)

Table 8. Reasons of satisfaction and dissatisfaction in awake fiberoptic nasotracheal intubation (the patient could answer more than 1 reason) (n = 30)

Reasons	Frequency Awake fiberoptic nasotracheal intubation
Safe	12
No pain	9
Comfortable	3
Mild irritation	3
Unable to swallow	2
Not tried	2
Pain in nose	1
Uncomfortable	1

Data present as number of the patients

model UNI-8900B using oxygen 10 L/min as a driving gas through a standard mouthpiece for 15 minutes with supplement of 1% lidocaine 5-10 ml via bronchoscope. The result was 100% successful in AFNI and similar to that from a recent study[13] which used nebulization technique and supplement with the spray-as-you-go technique.

Intubation with fiberoptic bronchoscope is easier in a conscious patient than the anesthetized one, whose decreased tone of the tongue, epiglottis, pyriform fossa and muscles and result in a sagging posterior tongue, falling back epiglottis and relaxing the pyriform fossa[2]. Awake fiberoptic endotracheal intubation is so far the safest approach in patients with problems such as unusual airway anatomy, facial or neck trauma, or cardiovascular instability. Awake fiberoptic intubation via nasal approach is often easier than the oral approach because the fiberoptic bronchoscope is usually pointed straight at the glottis as it entered the oropharynx, there is no sharp turn to negotiate and the vocal cords are usually visible from a distance[1]. The causes of failure in AFNI are poor topical anesthesia that made patients incorporative and with major nasal bleeding[1].

In the present study, the authors chose a small diameter endotracheal tube (Portex soft seal; number 6.5 for male and number 6.0 for female) because most of the patients being included in the present study had narrow or distorted airways and in order to avoid the problem of trauma, such as nasal bleeding.

As for the adequate topical anesthesia in AFNI, several reports described a method that requires several steps to anesthetize the nerves and ganglions that supply the sensory of the airway[3]. The methods

such as injection, packing, spray, nebulizer or atomizer could be applied. Excellent topical anesthesia of the airway was needed not only to reduce the respiratory reflex, cardiovascular stimulation, anxiety, and pain but also to enhance comfort and cooperation[3,4].

All 30 patients tolerated well to the nasal insertion of the endotracheal tube after their anterior ethmoidal nerve and sphenopalatine ganglion were anesthetized by using cotton swab stick packing which is a conventional technique.

The nebulizer of lidocaine was also shown to be beneficial in AFNI and in preventing hypertension and tachycardia during applying direct laryngoscope and endotracheal intubation[9,15-17]. In the past, it was known that the concentrations of 4-5% lidocaine nebulization were effective topical anesthesia for awake intubation[10]. In Thailand, the concentrations of 4-5% lidocaine were not available, so the authors tried to use the concentration of 2% lidocaine. Here, the authors have proved that this concentration (2% lidocaine) was also effective in 76.7% of the patients who needed no more local anesthetic.

The authors deliberately chose the technique of mouthpiece nebulizer administration 2% lidocaine aerosol, because the process of mouthpiece nebulization and nasal swab packing could be done together at the same time and it is possible to shorten the process of the airway topical anesthesia, which disturbs the patient (Fig. 1). Additionally, the nasal swab packing prohibited the patient from breathing per nose and promoted the patient to breathe per mouth, which may have a beneficial effect of nebulization by the mouthpiece nebulizer.

According to data of the present study, the authors' technique of topical anesthesia (nebulization of 5 ml of 2% lidocaine) could facilitate the distribution of local anesthetic to the pharynx, epiglottis, vocal cords, and trachea, and provided the complete anesthesia for successful AFNI within 3 min. in 80% of cases. The most common problem of AFNI was that it required time longer than 3 min. in five patients because the anesthesia at the pharynx and larynx were inadequate and supplementary two doses of 1% lidocaine 5 ml were required through the working channel of fiberoptic bronchoscope. In addition, there were two patients whose anesthesia at the pharynx and larynx were inadequate and required one supplementary dose of 1% lidocaine through the working channel of the fiberoptic bronchoscope. However, their intubation time was not longer than 3 min. Under observation of the authors, it was found that these patients' mouths were not sealed around the nebulizer mouthpiece during preparation for nebulization. Inappropriate application of the mouthpiece nebulizer may be the cause of inadequate anesthesia at the pharynx, larynx, and trachea. To prevent this problem, the authors suggest that patients should be advised to seal their mouth tightly around the mouthpiece while taking mouth breathing. On the other hand, the mask nebulizer may be used instead.

In 2001, the British Thoracic Society recommended the total dose of lidocaine applied during bronchoscope should be limited to 8.2 mg/kg[8]. Doses of up to 14.77 mg/kg of lidocaine, which were administered by a spray-as-you-go method, were reported to have experienced involuntary movement symptoms that indicated cortical irritability leading to a convulsion[11]. Although, in 1990, Webb J. measured serial plasma lidocaine concentrations during a similar protocol for topical lidocaine nebulizer and reported very low systemic absorption of topical lidocaine and minimal cardiovascular effect[12] a recent study[13] using combined nebulization and spray-as-you-go topical local anesthesia for airway reported the total dose of topical lidocaine of 7.3-9.2 mg/kg (median dose 8.9 mg/kg), and symptoms suggestive of lidocaine toxicity such as lightheadedness, dysphoria, nausea and shivering. In the present study, the total dose of topical lidocaine was 1.47-2.59 mg/kg (median dose 1.88 mg/kg) with cocaine 1.3-2.5 mg/kg (median dose 1.73 mg/kg) which is far less than both previous studies and guidelines and the authors found no symptom of local anesthetic toxicity.

The other adverse affects of lidocaine nebulizer are mild irritation, cough, impaired ability to swallow, numbness of the tongue, and oropharynx, husky character of voice. This suggested vocal cords paresis, feeling of obstruction during deep inspiration, and mild tinnitus[14]. In the present study, the authors found three cases who complained about the numbness of the tongue and difficulty in swallowing for a few hours post-operation, which dissatisfied the technique of topical anesthesia with lidocaine nebulization. The aerosol flow of lidocaine directly contacted the patient's tongue and was not a symptom of local anesthetic toxicity. For this reason, the technique of nebulization with mask nebulization, rather than mouthpiece, may be more suitable to avoid the numbness of the patient's tongue.

Conclusion

The authors concluded that the use of mouthpiece nebulization with 2% lidocaine 5 ml and

nasal packing with 10% cocaine 1 ml provides complete anesthesia for awake fiberoptic nasotracheal intubation in 76.7% of cases with expected difficult intubation. The method has proved to be simple, reliable, safe, and acceptable despite unpleasant numbness of the tongue in a few patients.

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ประสิทธิภาพของการให้ยาชาเฉพาะที่ด้วยวิธีสูดละอองฝอยทางปากร่วมกับวิธีการใช้ไม้พันสำลีอัดทางรูจมูกในการใส่ท่อหายใจด้วยกล้องขณะผู้ป่วยรู้สึกตัว

อัญชลี เตชะนิเวศน์, รื่นเริง ลีลานุกรม, พฤทธ์ ประพงศ์เสนา, ดนุชิต ทีระจินดา

วัตถุประสงค์: *เพื่อประเมินประสิทธิภาพของการให้ยาชาเฉพาะที่ด้วยวิธีสูดละอองฝอยทางปากร่วมกับการให้ยาชาเฉพาะที่ทางจมูกด้วยไม้พันสำลีสำหรับการใส่ท่อหายใจทางจมูกด้วยกล้องขณะผู้ป่วยรู้สึกตัว*

วัสดุและวิธีการ: *การศึกษาเชิงพรรณนาแบบไปข้างหน้าในผู้ป่วย ASA class I–II จำนวน 30 ราย ระหว่าง มีนาคม พ.ศ. 2547 - มิถุนายน พ.ศ. 2549 ซึ่งมารับการผ่าตัดแบบไม่ฉุกเฉินและคาดว่ามีภาวะใส่ท่อช่วยหายใจลำบาก โดยใช้การสูดละอองฝอยของ 2% lidocaine 5 มิลลิลิตรผ่านทางปากโดยใช้ mouthpiece ด้วยออกซิเจน 10 ลิตรต่อนาที ร่วมกับการใช้ไม้พันสำลีชุบ 10% cocaine 1 มิลลิลิตรอัดทางรูจมูกเป็นการระงับความรู้สึกเฉพาะที่ เป็นเวลา 15 นาที เพื่อทำการใส่ท่อช่วยหายใจทางจมูกด้วยกล้อง fiberoptic bronchoscope ในขณะที่ผู้ป่วยรู้สึกตัว หากผู้ป่วยขย้อนหรือ ไอรุนแรง สามารถให้ 1% lidocaine เพิ่มทางกล้องได้ครั้งละ 5 มิลลิลิตร*

ผลการศึกษา: *วิธีการดังกล่าวสามารถใส่ท่อช่วยหายใจได้สำเร็จทุกรายภายในครั้งแรก โดยใช้เวลาเฉลี่ย 119 $\pm$ 76.8 วินาที ผู้ป่วยมีปฏิกิริยาตอบสนองในแต่ละช่วงของการใส่ท่อช่วยหายใจอันได้แก่ ใส่ท่อช่วยหายใจผ่านรูจมูก, ใส่กล้องผ่านคอหอยและกล่องเสียง, ใส่กล้องผ่านหลอดลม และใส่ท่อช่วยหายใจผ่านหลอดลมตามลำดับดังนี้ ไม่มีปฏิกิริยาร้อยละ 53.3, 63.3, 23.3 และ 13.3, เจ็บหรือมีปฏิกิริยาเล็กน้อยร้อยละ 46.7, 10, 70 และ 86.7, เจ็บหรือมีปฏิกิริยาปานกลางร้อยละ 0, 3.3, 6.7, และ 0 และเจ็บหรือมีปฏิกิริยามากจนจำเป็นต้องเพิ่มยาชาเฉพาะที่ ร้อยละ 0, 23.3, 0 และ 0 โดยมีผู้ป่วย 2 รายจาก 30 รายที่ใช้ยาชา 1% lidocaine เพิ่มทางกล้อง 5 มิลลิลิตร และ 5 รายจาก 30 รายที่ใช้ยาชาเพิ่ม 10 มิลลิลิตร ไม่พบภาวะแทรกซ้อนที่รุนแรงในระหว่างการใส่ท่อช่วยหายใจ เช่น ออกซิเจนในเลือดต่ำ หัวใจเต้นผิดจังหวะ เป็นต้น และผู้ป่วย 24 ราย (ร้อยละ 80) รู้สึกพอใจต่อวิธีการให้ยาชา เฉพาะที่ดังกล่าว เนื่องจากรู้สึกปลอดภัย สบาย และไม่เจ็บ ผู้ป่วย 3 ราย (ร้อยละ 10) ไม่พอใจเนื่องจากมีอาการชาลิ้น และกลืนลำบาก และผู้ป่วย 2 รายไม่แสดงความคิดเห็น ส่วนผู้ป่วยที่เหลืออีก 1 รายไม่สามารถสอบถามข้อมูลได้เนื่องจาก ได้รับการเจาะคอโดยไม่ได้คาดหมาย*

สรุป: *การสูดพ่นละอองฝอย 2% lidocaine 5 มิลลิลิตรผ่านทางปากร่วมกับการอัดจมูกด้วยไม้พันสำลีชุบ 10% cocaine 1 มิลลิลิตร สามารถระงับความรู้สึกเพื่อใส่ท่อช่วยหายใจทางจมูกด้วยกล้องในผู้ป่วยที่สงสัยว่ามีภาวะใส่ท่อช่วยหายใจลำบากได้สำเร็จและปลอดภัย โดยมีผู้ป่วยร้อยละ 76.7 ไม่ใช้ยาชาเพิ่ม และผู้ป่วยร้อยละ 80 มีความพอใจต่อการให้ยาชาเฉพาะที่*