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ORIGINAL RESEARCH

Efficacy of nebulisation with 4% lignocaine versus spray as you go technique for awake fiberoptic intubation

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ABSTRACT

Background: To secure any ordinary, potentially challenging, or challenging airway, an anesthesiologist must acquire and become proficient in the fundamental technique of endotracheal intubation. The present study was conducted to compare the efficacy of nebulisation with 4% lignocaine versus spray as you go technique for awake fiberoptic intubation. **Materials & Methods:** 50 patients with difficult airway of both genders were selected. Patients in group I were nebulised with 4mL of 4% lignocaine while group II patients received four aliquots of 1mL 4% lignocaine through the working channel of the fiberoptic bronchoscope. The patients were compared for haemodynamic parameters, intubating conditions, intubation attempts, time taken for intubation and patient satisfaction score. **Results:** The mean age in group I was 37.2 years and in group II was 36.5 years. The mean weight was 62.3 kgs in group I and in group II was 64.2 kgs. The mean height was 170.4 cmsin group I and in group II was 172.3 cms. The difference was non- significant (P> 0.05). The mean MAP was 94.7 mm Hg in group I and 92.4 mm Hg in group II. The mean heart rate was 82.4 beats per minute in group I and in group II was 86.2 beats per minute. Time taken for intubation was 4.7 minutes in group I and 4.1 minutes in group II. The difference was non- significant (P>0.05). In group I and group II, four points score for intubating conditions was grade 1 seen in 20 and 12, grade 2 in 5 and 5, grade 3 in 0 and 7 and grade 4 in 0 and 1 patients respectively. Patient satisfaction score was excellent in 13 and 5, good in 12 and 9, reasonable in 0 and 10 and poor in 0 and 1 patients in group I and group II patients respectively. **Conclusion:** For awake fiberoptic intubation, the spray as you go approach is superior than nebulization with local anesthetic in terms of effectiveness and efficiency. It improves hemodynamic stability, intubating circumstances, patient comfort, and patient satisfaction.

Keywords: Intubation, Lignocaine, Nebulization

INTRODUCTION

To secure any ordinary, potentially challenging, or challenging airway, an anesthesiologist must acquire and become proficient in the fundamental technique of endotracheal intubation.[1] However, the majority of anesthesiologists prefer conscious intubation utilizing a fiberopticintubating bronchoscope if they encounter a challenging airway. This reduces the danger of airway loss while simultaneously offering a clear view of the airway and the opportunity to sustain spontaneous ventilation.[2] Adequate upper airway anesthesia is required for awake intubation in order to ensure the patient's comfort and cooperation. Local anesthesia or a mix of local anesthesia and sedation may be used for this procedure. Nonetheless, premedication combined with a local anesthetic is still the most common option.

Nebulization with an ultrasonic nebulizer, the "spray as you go" technique, which involves spraying local anesthetic directly onto the mucosa through the fiberoptic scope's working channel, and nerve blocks are some of the different methods for local anesthesia of the airway.[3] The gag, swallow, and cough reflexes that impede the scope's passage are all lessened by the aforementioned techniques. An straightforward and efficient strategy to anesthetize the airway is to apply a local anesthetic topically. As the fiberoptic bronchoscope is moved through the respiratory system, 2-4% lignocaine is often administered directly onto the respiratory mucosa through the working channel.[4] It is a straightforward method that causes no discomfort to the patient and calls for the least amount of skill from the therapist. Any of the aforementioned methods can be used to do awake intubation. However, the procedure's acceptance is determined by the patient's comfort, satisfaction, ease of intubation,

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and intubation time.[5] The present study was conducted to compare the efficacy of nebulisation with 4% lignocaine versus spray as you go technique for awake fiberoptic intubation.

MATERIALS & METHODS

The study was carried out on 50 patients with difficult airway of both genders. All gave their written consent to participate in the study.

Data such as name, age, gender etc. was recorded. Patients in group I were nebulised with 4mL of 4% lignocaine while group II patients received four aliquots of 1mL 4% lignocaine through the working channel of the fiberoptic bronchoscope. The patients were compared for haemodynamic parameters, intubating conditions, intubation attempts, time taken for intubation and patient satisfaction score. Four points score for intubating conditions were as- Grade 1 vocal cords open, no cough, no limb movements, no reaction by the patient, cooperative patient. Grade 2 vocal cords slightly moving, slight coughing and limb movements, slight grimacing and restless patient. Grade 3 vocal cords close, moderate coughing and limb movements, heavy grimacing and severe resistance by patient. Grade 4 vocal cords closed, severe coughing and limb movements, severe resistance by the patient.Results thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I Demographic profile

Parameters	Group I	Group II	P value
Age (years)	37.2	36.5	0.92
Weight (kgs)	62.3	64.2	0.76
Height (cms)	170.4	172.3	0.48

Table I shows that mean age in group I was 37.2 years and in group II was 36.5 years. The mean weight was 62.3 kgs in group I and in group II was 64.2 kgs. The mean height was 170.4 cmsin group I and in group II was 172.3 cms. The difference was non- significant (P> 0.05).

Table II Haemodynamic profile

Parameters	Group I	Group II	P value
MAP (mm Hg)	94.7	92.4	0.95
Heart rate (beats per minute)	82.4	86.2	0.81
Time taken for intubation (mins)	4.7	4.1	0.73

Table II shows that mean MAP was 94.7 mm Hg in group I and 92.4 mm Hg in group II. The mean heart rate was 82.4 beats per minute in group I and in group II was 86.2 beats per minute. Time taken for intubation was 4.7 minutes in group I and 4.1 minutes in group II. The difference was non- significant (P>0.05).

Table III Assessment of parameters

Parameters	Variables	Group I	Group II	P value
Four points score	Grade 1	20	12	0.05
	Grade 2	5	5	
	Grade 3	0	7	
	Grade 4	0	1	
Patient satisfaction score	Excellent	13	5	0.01
	Good	12	9	
	Reasonable	0	10	
	Poor	0	1	

Table III, graph I shows that in group I and group II, four points score for intubating conditions was grade 1 seen in 20 and 12, grade 2 in 5 and 5, grade 3 in 0 and 7 and grade 4 in 0 and 1 patients respectively. Patient satisfaction score was excellent in 13 and 5, good in 12 and 9, reasonable in 0 and 10 and poor in 0 and 1 patients in group I and group II patients respectively.

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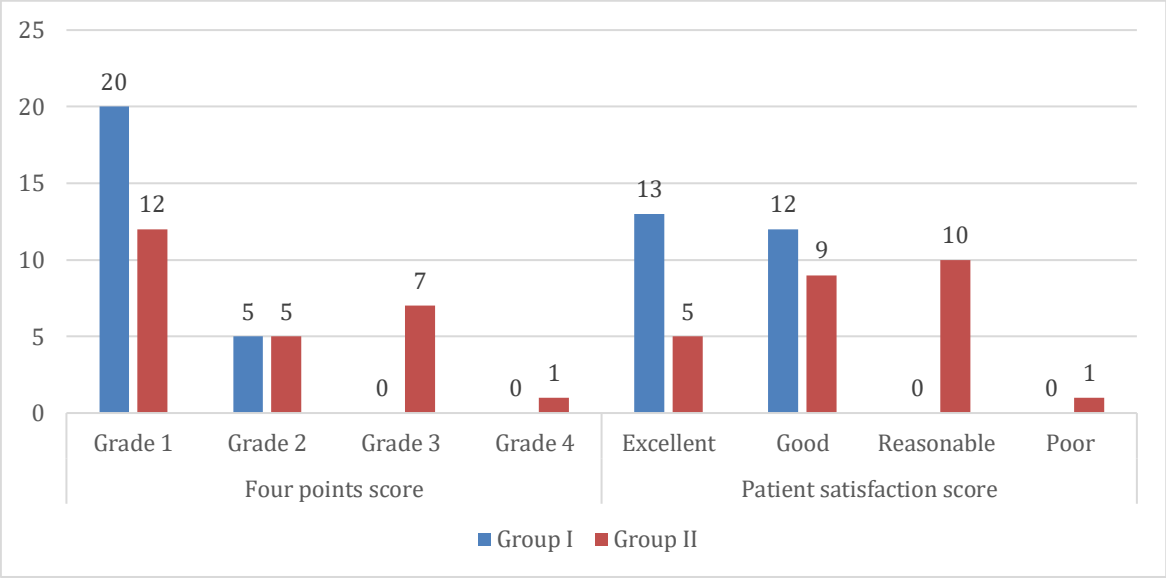
Graph I Assessment of parameters



DISCUSSION

Since the tone of the airway structures is preserved, awake fiberoptic bronchoscopy is the gold standard for managing challenging airway situations. Since it has several benefits over intubation during the induction of general anesthesia, chief among them being the preservation of spontaneous breathing, several authors have investigated its potential in the management of problematic airways.[6,7] To reduce anxiety and ensure patient comfort throughout the treatment, the patient must be carefully prepared pharmacologically and psychologically.[8] Lower respiratory tract anesthesia is administered by local anesthetic instillation via fiberoscope working channel, nebulization, or transtracheal injection, whereas upper airway topicalization is typically accomplished with lignocaine gel, spray, lozenges, and gels.[9] The present study was conducted to compare the efficacy of nebulisation with 4% lignocaine versus spray as you go technique for awake fiberoptic intubation.

We found that mean age in group I was 37.2 years and in group II was 36.5 years. The mean weight was 62.3 kgs and in group II was 64.2 kgs. The mean height was 170.4 cms and in group II was 172.3 cms. Kaur et al[10] compared the efficacy of nebulisation with 4% lignocaine versus spray as you go technique for awake fiberoptic intubation. 60 patients of American Society of Anesthesiologists (ASA) grade I-III were randomly divided into two groups (group N and group S). Patients in group N were nebulised with 4mL of 4% lignocaine while group S patients received four aliquots of 1mL 4% lignocaine through the working channel of the fiberoptic bronchoscope. On comparing the intubating conditions, the patients in group S showed better intubation score than the patients in group N. The time taken for intubation was lesser (4.56±0.85 minutes in group S and 4.0±0.45 minutes in group N) and the patient satisfaction score was also better in the spray as you go group.

We found that mean MAP was 94.7 mm Hg in group I and 92.4 mm Hg in group II. The mean heart rate was 82.4 beats per minute in group I and in group II was 86.2 beats per minute. Time taken for intubation was 4.7 minutes in group I and 4.1 minutes in group II. Sethi N et al[11] compared three different methods of anaesthetizing the airway. 60 adult patients (American Society of Anaesthesiologists status I-III and Mallampati class III & IV), scheduled for elective surgery, received sedation followed by spraying of the nares and posterior pharyngeal wall with 4% lignocaine. Thereafter the patients received 4 ml of 4% lignocaine either by transtracheal injection (n=20, group A), via intubating fiberscope using 'spray as you go' technique (n=20, group B) or by nebulizer 20 min before intubation, (n=20, group C). Patients were asked to score the procedure using visual analog scale (VAS) and severity scores. Episodes of coughing, choking, stridor, extra / total local anaesthetic used and intubation times were recorded. Patients were monitored continuously for vital parameters. Group B patients showed better VAS scores with shorter intubation times and had a lower incidence of coughing and choking. The endoscopists' VAS scores also showed a preference for group B.

We found that in group I and group II, four points score for intubating conditions was grade 1 seen in 20 and 12, grade 2 in 5 and 5, grade 3 in 0 and 7 and grade 4 in 0 and 1 patients respectively. Patient satisfaction score was excellent in 13 and 5, good in 12 and 9, reasonable in 0 and 10 and poor in 0 and 1 patients in group I and group II patients respectively. In a study by Kundra P et al[12] 48 ASA adult was assigned at random to receive either translaryngeal block, bilateral superior laryngeal nerve block, or three 4% lignocaine-soaked cotton swabs in the nose (CRB group) or four milliliters of 4% nebulized

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lignocaine (nebulization group). Grimace and airway reactivity ratings were used to evaluate patient comfort and facial grimace. On a 4-point scale, patients indicated how uncomfortable they were. Every patient had a successful FNI with minimal discomfort; 83% of patients in the CRB group and 79% of patients in the nebulization group said the procedure was comfortable. When the endotracheal tube (ETT) was inserted through the nostril, the nebulization group's grimace score was higher than the CRB group's ($P<0.005$). In a similar way, patients in the CRB group experienced greater comfort than those in the nebulization group when the ETT was passed via their glottis. All patients had a progressive increase in heart rate from the start of the operation, although the nebulization group's rise was larger ($P<0.05$) and persisted longer than the CRB group's ($P<0.05$). Mean arterial pressure was higher in the nebulization group when compared to the CRB group ($P<0.05$), with patients belonging to the CRB group demonstrating considerable haemodynamic stability.
The shortcoming of the study is small sample size.

CONCLUSION

Authors found that for awake fiberoptic intubation, the spray as you go approach is superior than nebulization with local anesthetic in terms of effectiveness and efficiency. It improves hemodynamic stability, intubating circumstances, patient comfort, and patient satisfaction.

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