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Original Article

Comparative Study of Topical Local Anesthesia using Transtracheal (Transcricoid) Injection and "Spray as You Go" Technique during Awake Fiberoptic Intubation of Oral Cancer Patients Posted for Elective Surgery

Dattatraya Gangurde[1], H P Bhagat[2]

[1]Assistant Professor, Department of Anaesthesia, Government Medical College and Cancer Hospital, Aurangabad, Maharashtra, India, [2]Professor, Department of Anaesthesia, Government Medical College and Cancer Hospital, Aurangabad, Maharashtra, India

Abstract

Background: The successful conduct of awake fiberoptic intubation is dependent on effective local anesthesia. The aim of study was to compare transtracheal injection and "spray as you go" technique for anesthetizing airway.

Material and Methods: A total of 100 oral cancer patients of the American Society of Anesthesiologist Grade I and II with Mallampati Class III and IV are posted for elective surgery. All overnight fasted patient consent taken and received sedation followed by 0.1% xylometazoline nasal drop in nasal nares followed by 2 ml 2% lignocaine jelly and 3-4 spray of 10% lignocaine spray done. Thereafter two group Group "A" (n = 50) patients received 4 ml of 4% lignocaine by transtracheal (transcricoid) injection and Group "B" (n = 50) patients received 4 ml of 4% lignocaine through fiberoptic bronchoscope by "spray as you go" technique. After that during fiberscope cough count done and also grading of overall intubation condition (as assessed by anesthesiologist) done. Furthermore, intubation time recorded in both groups. Patients monitoring was done throughout procedure.

Results: In Group "A" mean cough count was 14 and Group "B" shows 22 and also mean intubation time in Group "A" was 68 second and Group "B" 92 s. Statistically Group "A" are better than Group "B."

Conclusion: The transtracheal injection technique of topical local anesthetic application better than "spray as you go' technique for providing effective local anesthesia during awake fiberoptic intubation.

Key words: Awake fiberoptic intubation, Difficult airway, Topical local anesthesia

INTRODUCTION

Oral cancer is most common cancer amongst the male in India.[1] Oral cancer patient is challenging for anesthesiologist because of difficult intubation.[2] However, today there are too much improvement in airway management nowaday new gadgets like fiberoptic bronchoscope available for difficult airway management. The American Society of Anesthesiologist (ASA) and many European authors recommended awake fiberoptic intubation where difficult intubation is anticipated which can lead to the life-threatening "can't intubate, can't ventilate" scenario.[3] Awake fiberoptic is often unpleasant procedure. Hence,before awake fiberoptic intubation, the upper airway is commonly anesthetized by local lignocaine spray or gel, the modalities of applying local anesthetic to the larynx and lower respiratory tract include injection via fiberoptic bronchoscope, i.e., "Spray as you go" technique, transtracheal (transcricoid) injection and nebulization.[4]

Aim of this study was to compare local anesthetic application technique, i.e., transtracheal injection and "Spray as you go"

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Corresponding Author: Dattatraya Gangurde, Flat no. 7, Anmol apartment, Behind firebrigade office, Shriramnagar, Padampura, Aurangabad 431 001, Maharashtra, India. Phone: +91-7350718862. E-mail: dats20091@gmail.com

technique for patient undergoing awake fiberoptic intubation. It was also proposed to study the acceptability and suitability of these techniques to anesthesiologist with objective measurement of cough and intubation time.

MATERIALS AND METHODS

ASA Status I and II 100 oral cancer patients between age group of 20-50 years were included in study. All the patients had an anticipated difficult airway with Mallampati Class III and IV and were undergo awake fiberoptic intubation. After informed consent, patients were randomized into two groups each received 4 ml of 4% lignocaine with either of two different methods:

Group "A" (n = 50) via transtracheal (transcricoid) injection.

Group "B" (n = 50) via fiberoptic bronchoscope, i.e., "spray as you go."

All the patients which included in study were overnight fasted. In operation theater, an intravenous access was established and monitoring instituted, viz., electrocardiogram (ECG), oxygen saturation and noninvasive blood pressure (NIBP). Through intravenous injection glycopyrrolate 0.2 mg, injection midazolam 1 mg and injection fentanyl 100 ug were given. Further 2 drops of 0.1% xylometazoline were instilled in each nostril. Thereafter nasal passage was lubricated with 2 ml of 2% lignocaine jelly and posterior pharyngeal wall anesthetized with 4 sprays of 10% lignocaine spray. Then laryngotracheal anesthesia before intubation of trachea done. Group "A" patients were given 4 ml of 4% lignocaine transtracheal through cricothyroid membrane puncturing with 22 G needle and Group "B" patients given 4 ml of 4 % lignocaine through fiberoptic bronchoscope port on vocal cords after cord visualization. Fiberoptic bronchoscope done by same anesthesiologist was to avoid subjective errors in results. The lubricated portex endotracheal tube was passed through mares after visualization of carinal bifurcation. The endotracheal tube was slid off the fiberoptic bronchoscope and midtracheal placement was confirmed under direct vision. During entire procedure following observation made.

1. Incident of cough, i.e., cough count
2. Intubation time (i.e., time from introduction of fiberoptic bronchoscope till the first measurement of end tidal carbon dioxide were recorded)
3. Pulse, NIBP, oxygen saturation, ECG.

To assess anesthesiologist was asked to grade the overall intubation conditions in each case.

Grading of overall intubation condition (as assessed by anesthesiologist).

Grade I: No adverse events, cough/stridor, cooperative and well tolerated.

Grade II: Coughed once or twice, cooperative with reassurance, tolerated the tube well.

Grade III: Coughed repeatedly, no stridor tube accepted.

Group IV: Coughed repeatedly, stridor present, uncooperative, did not allow scope to pass beyond glottis.

From above grading, results were analyzed statistically using "Chi-square test" and probability values $P < 0.05$ were taken as significant.

RESULTS

Table 1 shows demographic data of both Group "A" and Group "B," from that both groups were similar demographically without significant difference.

Table 2 shows cough count of both groups. Mean cough count for Group "A" was 14 and Group "B" was 22. From this cough count for Group "A" was significantly lower than Group "B" ($P < 0.05$).

Intubation time also recorded for both groups. Table 3 shows mean intubation time for Group "A" which was 68 second and for Group "B" was 92 s, so intubation time significantly low for Group "A."

Furthermore, intubation condition grading done by anesthesiologist, Table 4 shows intubation condition grading for Group "A" it was Grade I 37 compared to 24 for Group "B," which is significantly better in Group "A" ($P < 0.01$) as compared to Group "B."

DISCUSSION

This study was done for comparison of transtracheal injection and "spray as you go' technique of topical local

Table 1: Demographic data

Demographic data	Group "A"	Group "B"
Age in years	40±2.2	42±1.8
Weight in kg	58.2±1.4	56±1.3
Sex (M:F)	32:18	28:22

Table 2: Cough count in each group

Cough	Group "A"	Group "B"
Cough count (mean)	14	22

Table 3: Intubation time in each group

Intubation time	Group "A"	Group "B"
Intubation time in seconds	68 (42-164)	92 (47-255)

Table 4: Intubating condition

Grade	Group "A"	Group "B"
Grade I	37	24
Grade II	06	11
Grade III	05	09
Grade IV	02	06

anesthetic application during awake fiberoptic intubation. In this study, we used cough count and intubation time required during fiberoptic intubation for assessment of topical local anesthetic application.

The result of this study comparison done with other study which shows certain similarities. In this study Group "A," i.e., transtracheal injection shows less cough count than Group "B," i.e., "spray as you go' technique this result when compared with Webb *et al*.[5] they also found same result as this study, i.e., transtracheal (transcricoid) injection of lignocaine produced less cough than "spray as you go' technique.

Graham *et al*.[6] using phonopneumography found that transtracheal method produced less cough and stridor during bronchoscope as compared to "spray as you go" technique and nebulization technique that result similar to this study result but only difference is they used 4 ml of 2.5% cocaine and in this study we used 4 ml of 4% lignocaine.

In this study intubation time required for transtracheal injection less than "spray as you go" technique which is compared with Schaefer *et al*.[7] and Ovassapian[8] study. They also found mean intubation time 64 s in transtracheal injection method which was similar to this study.

CONCLUSION

From this study, we concluded that during awake fiberoptic intubation using topical local anesthetic by transtracheal injection is better than "spray as you go" technique.

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