Indian Journal of Basic and Applied Medical Research; September 2018: Vol.-7, Issue- 4, P . 287 -290

Original article:

Comparison between lignocaine nebulization and airway nerve block for awake fiberoptic bronchoscopy-guided nasotracheal intubation

***Dr Anshuman , **Dr Manju Jha**

*Resident, **HOD, Department of Anesthesiology, Rural Medical College, PIMS (DU) , Loni.
Corresponding author**

Abstract:

Introduction: Administrating general anaesthesia in an unanticipated difficult airway can jeopardize patient's life. In patients with difficult airway, awake fiberoptic intubation is considered a safe method for intubating trachea under vision and can be done in patients with cervical spine instability, facial fractures, craniofacial abnormalities, TMJ ankylosis .

Material and Methods: This observational study was conducted to compare the efficacy of lignocaine nebulization and airway nerve block for achieving airway anaesthesia before awake Fiberoptic bronchoscopy-guided intubation. The primary objective was to compare the intubation time of the two techniques. The secondary objective were to assess the quality of airway anaesthesia, degree of patient comfort and post operative patient satisfaction.

Observations and result : No failure of intubation was observed in any of the group and all 40 patients were considered for statistical evaluation.

Conclusion: This study revealed that airway anaesthesia using airway nerve blocks is superior to lignocaine nebulization for awake Fiberoptic bronchoscopy-guided nasotracheal intubation, in terms of ease of intubation and patient comfort and satisfaction.

Introduction:

Administrating general anaesthesia in an unanticipated difficult airway can jeopardize patient's life. In patients with difficult airway, awake fiberoptic intubation is considered a safe method for intubating trachea under vision[1] and can be done in patients with cervical spine instability, facial fractures, craniofacial abnormalities, TMJ ankylosis [2,3]. To suppress airway reflexes and discomfort during bronchoscopy, appropriate anaesthesia for nose, oropharynx, larynx and trachea is prerequisite. For deep and rapid anaethesia, airway nerve blocks [4] are frequently used while nebulization with local anaesthesia saves the patient from multiple needle pricks. With Dexmedetomidine for procedural sedation comparison of airway nerve block and lignocaine nebulization was conducted. These techniques help to allay anxiety so that the patient is more cooperative during the procedure[5].

Material and Methods:

This observational study was conducted to compare the efficacy of lignocaine nebulization and airway nerve block for achieving airway anaesthesia before awake Fiberoptic bronchoscopy-guided intubation. The primary objective was to compare the intubation time of the two techniques. The secondary objective were to assess the quality of airway anaesthesia, degree of patient comfort and post operative patient satisfaction.

www.ijbamr.com P ISSN: 2250-284X , E ISSN : 2250-2858

Methodology

After gaining clearance from institutional ethical committee and informed consent from patients, study was conducted on 40 patients(20 in each group), of either gender, aged between 18-60 years under class ASA 1 and 2, undergoing surgery under general anaesthesia RMC, Loni and willing for the study.

Patients who were unwilling, allergic to any study drug, asthmatic, epileptics, hemodynamically unstable, or deranged coagulation profile were excluded.

Sample size

The minimum sample size calculated using open-epi software, applied to study by pooja et al.[6] for power of 0.8 and type 1 error of 0.05 was 30 (15 in each group).

To allow for study error and attrition, a total of 40 patients were included in this study

Study conduct

After thorough airway assessment, preanaesthetic checkup and explanation of procedure , patients were studied under two groups depending upon kind of premedication recieved. Patients were taken into procedure room, after obtaining baseline parameters; IV line was secured. Glycopyrolate (5µg/kg) was administered intravenously and xylometazoline 0.1% were instilled in the nasal cavity.

Midazolam (20µ/kg,IV stat) and dexmedetomidine (1µ/kg, IV) were infused over a 10 minute period to achieve procedural sedation.

In Group N, patients (n=20) received 10 ml of 4% lignocaine jet nebulizer for 15 minutes.

In Group B, patients (n=20) received bilateral superior laryngeal nerve block using 2cc of 2% lignocaine and intratracheal block with 4cc of 4% lignocaine.

1 ml of 2% lignocaine jelly was applied to the nasal mucosa in both groups and awake intubation performed using Fiberoptic bronchoscope by senior anaesthesiologist (performed more than 50 successful Fiberoptic intubation) who was blinded to the groups.

General Anaesthesia was achieved with propofol (2mg/kg,IV) and vecuronium bromide (0.1mg/kg,IV). Post-op assessment was done for adverse effects like sore throat, hoarseness.

Statistical analysis

Statically analysis included using Student's test for parametric data, the Mann-Whitney U test for non-parametric data and Fisher's test for categorical data. Continuous variables are expressed as means ± standard deviation and categorical variables as proportions(%).

P values <0.05 were considered to be statistically significant.

The statistical evaluation was done using Graph Pad software version PRISM 7.

Observations and result

No failure of intubation was observed in any of the group and all 40 patients were considered for statistical evaluation.

Result for hemodynamic variables

On applying one way ANOVA for inter group comparison, no significant statistical difference was observed at a point for heart rate, mean arterial pressure and oxygen saturation.

On intra group comparison by applying repeated measures ANOVA, significant fall was observed in heart rate and mean arterial pressure at the time of giving nebulization/block, which returned to base line after intubation.

The rise in heart rate and mean arterial pressure after intubation was more in Group N, however the rise in either group was not statistically significant. Oxygen saturation was comparable to baseline in both groups at all time intervals.

Discussion:

Several authors have compared different airway anaesthesia techniques like Webb et al. [7] compared trans-cricoids lignocaine injection with use of the spray-as-you-go technique, Graham et al[8] compared three different methods of providing airway anaesthesia, Kundra et al.[9] compared nebulised lignocaine 4% with combined regional nerve block. Airway nerve block provides rapid and deep anaesthesia with only small doses of local anaesthetic but procedure involves risk of accidental intravascular injection and nerve injury and airway nerve block is not feasible in distorted anatomy. Nebulisation of local anaesthetics is another technique that deposits fine droplets directly over the mucosa, obviating the need for multiple painful injections, can also be used in cases where nerve block cannot be performed.

In our study, no failure of intubation was noted in either group. The mean intubation time was significantly shorter in the nerve block group; this was similar to the findings of Gupta et al[10], who reported a mean intubation time of 123±46.7s in a nerve block group and 200.4±72.4s in a nebulization group (P=0.047). However,Reasoner et al.[11] found no significant difference in intubation time between nerve block and topical anesthesia groups and in both of their groups the intubation time was longer than in other study.

The intubating conditions were better in Group B compared with Group N, similar to the studies of Webb et al.[7], Graham et al[8] and Sethi et al.[12]. However, Reasoner et al[11] and Gupta et al [10] found no significant difference in intubating conditions between groups.

We compared patient comfort between our two study groups according to cough severity and intubation comfort scores during and after intubation; patient comfort was higher in nerve block group. Hemodynamic parameters remained stable in our patients and there was no sympathetic stimulation during intubation due to use of Dexmedetomidine infusion for sedation. Although significant reduction in mean heart rate and blood pressure from baseline just after intubation in both groups were noted.

Contrary to our study, Kundra et al.[9] reported a progressive increase in heart rate and mean arterial pressure in all of their patients, was significantly greater in the nebulization group. In our study, patient satisfaction scores recorded 24 hours after surgery were higher in Group B than in Group N. Adverse effects, such as sore throat, hoarseness and unpleasant memories, were not found to differ significantly between the groups. No other adverse effects like hypoxia, severe hypotension, severe bradycardia, bradyarrhythmia, bronchospasm or seizures due to lignocaine toxicity were recorded in either group.

Conclusion:

This study revealed that airway anaesthesia using airway nerve blocks is superior to lignocaine nebulization for awake Fiberoptic bronchoscopy-guided nasotracheal intubation, in terms of ease of intubation and patient comfort and satisfaction. Nevertheless, lignocaine nebulization may be used as an alternative technique for airway anaesthesia when nerve block is not feasible, because we observed no case of failure of awake Fiberoptic intubation and no complication related to nebulization. Airway nerve blocks are considered a gold standard; bilateral superior laryngeal nerve blocks, which anaesthetize the larynx above the level of the vocal cords and block glottic closure reflex; and transtracheal nerve blocks, which anaesthetize the trachea and larynx below the level of the vocal cords and abolish cough reflex.

References:

1] Panchabai TS, Mehta AC. Historical perspectives of bronchoscopy. Connecting the dots. AnnAm Thorac Soc 2015:12:631-41

2] Yrigoyen E, Fujikawa YF. Flexible fiberoptic bronchoscopy. Anaesthesia, technique and results. West J Med 1975; 122:117-22

3] Diaz-Jimenez JP, Rodriguez AN. Interventions in Pulmonary Medicine. Houston, Springer. 2013, pp 13-31

4] Parkes SB, Butler CS, Muller R. Plasma lignocaine concentration following nebulization for awake intubation. Anaesthesia Intensive Care 1997; 25:369-71

5] Dhasmana SC. Nasotracheal fiberoptic intubation: patient comfort, intubating conditions and hemodynamic stability during conscious sedation with different doses of dexmedetomidine. J Maxillofac Oral Surg 2014; 13:53-8

6] Pooja Rawat Mathur, Neena Jain, Aji Kumar, Beena Thada, Veena Mathur and Deepak Garg et al. Comparison between lignocaine nebulization and airway nerve block for awake fiberoptic bronchoscopy-guided nasotracheal intubation. Korean J Anesthesiol 2017; 2017-e54

7] Webb AR, Fernando SS, Dalton HR, Arrowsmith JE, Woodhead MA, Cummin AR. Local anaesthesia for fiberoptic bronchoscopy: transcricoid injection or the “spray as you go” technique? Thorax 1990;45:474-7

8] Graham DR, Hay JG, Clague J, Nisar M, Earis JE. Comparison of three different methods used to achieve local anaesthesia for fiberoptic bronchoscopy. Chest 1992; 102: 704-7

9] Kundra P, Kutralam S, Ravishankar M. Local anaesthesia for awake fiberoptic nasotracheal intubation. Acta Anaesthesiol Scand 2000; 44:511-6

10] Gupta B, Kohli S, Farooque K, Jalwal G, Gupta D, Sinha S, et al. Topical airway anaesthesia for awake fiberoptic intubation: Comparison between airway nerve blocks and nebulized lignocaine by ultrasonic nebulizer. Saudi J Anaesth 2014;8(Suppl 1): S15-9

11] Reasoner DK, Warner DS, Todd MM, Hunt SW, Kirchner J. A Comparison of anaestheitic techniques for awake intubation in neurosurgical patients. J Neurosurg Anaesthesiol 1995;7:94-9

12] Sethi N, Tarneja VK, Madhusudanan TP, ShoucheS. Local Anaesthesia for fiberoptic intubation: a comparison of three techniques. Med J Armed Forces India 2005;61:22-5