ORIGINAL RESEARCH PAPER
Volume - 12 | Issue - 06 | June - 2023 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

A COMPARATIVE STUDY FOR AWAKE FIBEROPTIC INTUBATION BETWEEN LIGNOCAINE NEBULIZATION AND LIGNOCAINE NEBULIZATION WITH AIRWAY NERVE BLOCK

Anaesthesiology

Dr Dharmendra Kumar Yadav Associate Professor, Department of Anaesthesiology and Critical Care, Moti Lal Nehru Medical College, Prayagraj

Dr Shobhit Singh Assistant Professor, Department of Anaesthesiology and critical care, Moti Lal Nehru Medical College, Prayagraj.

Dr Neelam Singh Professor and Head, Department of Anaesthesiology and Critical Care, Prayagraj.

Dr. Saumya Srivastava* Junior Resident Department of Anaesthesiology and Critical Care *Corresponding Author

ABSTRACT

Background:- Awake fiberoptic intubation is an eminent method for securing an anticipated difficult airway. Airway anaesthesia is a crucial part for fiberoptic intubation and can be achieved by various techniques either alone or in combination. This study is a comparison between two of those widely accepted methods. **Material And Method:-** In present study 50 patients of either sex, aged between 18-60 years belonging to ASA I- II undergoing elective surgery at our institution were taken. Group A (n=25) received lignocaine nebulization and Group B (n=25) received lignocaine nebulization with airway nerve block. **Result:-** The two groups were compared across various parameters such as heart rate, blood pressure, intubating conditions, comfort post intubation and assessment was done. **Conclusion:-** Lignocaine nebulization with airway nerve block is a superior method for airway anaesthesia compared to lignocaine nebulization alone.

KEYWORDS

Lignocaine nebulization, Airway nerve blocks, Fiberoptic intubation

INTRODUCTION:-

Airway management is an essential part of general anaesthesia, crucial for ventilation, oxygenation, and for delivery of anaesthetic gases. Anaesthesiologists are considered as experts when it comes to airway management, but sometimes, even the experts need some help navigating the complexities of a difficult airway. ASA defines a difficult airway as "The clinical situation in which a conventionally trained anaesthesiologist experiences difficulty with mask ventilation, difficulty with tracheal intubation, or both"[1]. In theory, awake tracheal intubation (ATI) may be the safest method for securing an anticipated difficult airway, however it can cause significant patient worry and discomfort[2] Appropriate anaesthesia of the oral cavity, larynx and trachea before intubation has been demonstrated to reduce the intubation reflexes[3] Various anaesthetic procedures, including topical anaesthetic and airway nerve blocks, are being employed to numb the airway. This study is a comparison of the aforementioned two methodologies. Airway nerve blocks are commonly utilized for awake fiberoptic intubation because they provide quick and profound anaesthesia as well as maximum patient comfort [4] The following nerve blocks are used:

- Superior laryngeal nerve block.
- Recurrent laryngeal nerve block.
- Glossopharyngeal nerve block.

Nebulization with local anaesthetics is another promising technique. In this method, the airway is anesthetized completely without the need for multiple painful injections. It is preferred in patients who are uncooperative for nerve blocks and or have some anatomical abnormalities and nerve blocks are not feasible.

AIMS AND OBJECTIVES: -

AIM : To compare between lignocaine nebulization and lignocaine nebulization with airway nerve blocks for airway anaesthesia prior to awake fiberoptic bronchoscopy-guided intubation.

OBJECTIVE:

1. To observe which method has better intubating condition.
2. Better hemodynamic response
3. Better patient compliance

MATERIALS AND METHODS:-

This prospective randomized clinical study entitled **"Comparative study for awake fiberoptic intubation between lignocaine nebulization and lignocaine nebulization with airway nerve block"** was conducted after clearance from Board of Studies and Ethical committee in the Department of Anaesthesiology, M.L.N Medical College, Prayagraj. during a period of one year after obtaining ethical committee clearance and informed and written consent from all patients.

50 patients posted for elective surgery were taken for this study. They were randomly divided in 2 groups of 25 each Glycopyrrolate (5 µg/kg) was administered intravenously (IV) and two drops of xylometazoline 0.1% was instilled in the nasal cavity. Dexmedetomidine (1 µg/kg, IV) was infused over a 10-min period to achieve procedural sedation (Ramsay sedation score of 3).After obtaining baseline parameters, such as heart rate, non-invasive blood pressure, oxygen saturation, and electrocardiographic data, an iv line was secured for intravenous infusion of crystalloids. Group A patients (n = 25) received 10 ml of 4% lignocaine nebulization for 15 min. Group B, patient received 10 ml of 4% lignocaine nebulization for 15 min along with nerve blocks (superior laryngeal, recurrent laryngeal and glossopharyngeal) using 2% lignocaine.

After recording the vital signs, awake fiberoptic bronchoscopy was done. The patient was induced, and endotracheal tube cuff was inflated. Parameters including intubating conditions, vocal cord position, intubation time, patient comfort and vital signs were recorded. Vital signs were recorded after 1, 3, 5, and 10 min of intubation.

Statistical Analysis: -

When comparing the mean values of the two groups, the student t-test was utilized, whilst the chi-square test was utilized to analyse the frequency differences between the two groups. P-value < 0.05 was regarded to be statistically significant, P- value >0.05 was regarded to be non significant.

Grading system was used to assess intubating conditions and patient comfort and satisfaction[5]

OBSERVATIONS AND RESULTS

Table 1: Distribution of study population according to demography

	Group A		Group B		p-value
	Mean	Std. Deviation	Mean	Std. Deviation	
Age	37.12	6.360	38.68	10.181	0.519

Gender	Groups		Total
	Group A	Group B	
Male	12	10	22
	48.0%	40.0%	44.0%

Female	13	15	28
	52.0%	60.0%	56.0%
2 value = 0.325, p-value = 0.569			

Table 2: Comparison between the two groups with respect to heart rate

	Group A		Group B		P
Heart Rate	Mean	Std. Deviation	Mean	Std. Deviation	-value
0 minute	94.92	5.70	72.20	6.07	0.001*
1 min	88.48	3.84	71.24	6.09	0.001*
3 min	85.44	3.28	71.04	5.36	0.001*
5 min	82.68	3.20	75.24	11.11	0.002*
10 min	77.80	4.58	74.00	7.94	0.044*
20 min	74.64	3.64	75.24	8.00	0.734
30 min	72.48	3.74	73.04	9.31	0.781
60 min	68.60	4.00	74.32	6.43	0.001*

There was significant difference (p value<0.05) in mean Heart Rate at 0 minute, 1 minute, 3 minutes, 5 minutes, 10 minutes, 20 minutes, 30 minutes and 60 minutes between Group A and Group B

Table 3: Comparison between the two groups with respect to diastolic blood pressure

Diastolic Blood Pressure	Group A		Group B		p-value
	Mean	Std. Deviation	Mean	Std. Deviation	
0 minute	92.68	3.33	74.60	7.93	0.001*
1 min	90.80	3.37	78.16	8.31	0.001*
3 min	89.88	3.44	77.80	7.47	0.001*
5 min	85.28	4.73	75.00	8.35	0.001*
10 min	79.28	5.53	73.76	7.92	0.006*
20 min	73.32	4.75	72.40	7.23	0.047*
30 min	68.96	4.78	74.08	7.54	0.006*
60 min	67.60	4.79	74.32	7.72	0.001*

There was significant difference (p value<0.05) in mean Diastolic Blood Pressure at 0 minute, 1 minute, 3 minutes, 5 minutes, 10 minutes, 20 minutes, 30 minutes and 60 minutes between Group A and Group B.

Table 4: Comparison of the two groups with respect to systolic blood pressure

Systolic Blood Pressure	Group A		Group B		p-value
	Mean	Std. Deviation	Mean	Std. Deviation	
0 minute	136.56	4.81	112.92	5.48	0.001*
1 min	134.56	4.57	111.04	4.94	0.001*
3 min	133.20	4.72	109.60	4.61	0.001*
5 min	127.64	5.66	109.16	4.21	0.001*
10 min	120.96	6.25	109.12	4.73	0.001*
20 min	114.48	5.64	108.08	4.52	0.001*
30 min	108.64	4.48	107.88	4.36	0.046*
60 min	104.72	4.53	107.44	3.78	0.026*

There was significant difference (p value<0.05) in mean Systolic Blood Pressure at 0 minute, 1 minute, 3 minutes, 5 minutes, 10 minutes, 20 minutes, 30 minutes and 60 minutes between Group A and Group B.

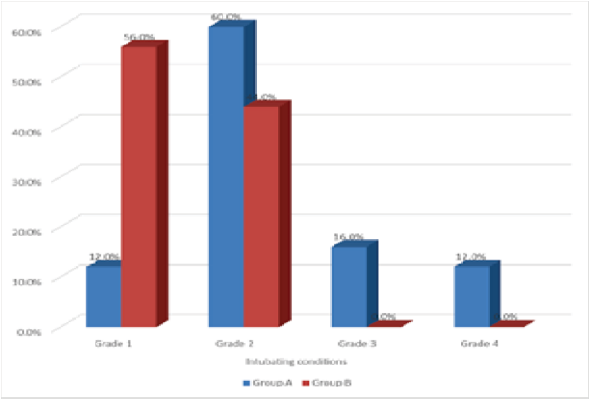
Table 5: Comparison of the two groups with respect to oxygen saturation

SpO2	Group A		Group B		p-value
	Mean	Std. Deviation	Mean	Std. Deviation	
0 minute	99.28	0.74	99.00	0.71	0.177
1 min	99.28	0.68	99.04	0.79	0.255
3 min	99.04	0.68	98.96	0.68	0.677
5 min	99.04	0.45	98.72	0.46	0.117
10 min	99.04	0.68	98.76	0.66	0.146
20 min	99.24	0.66	98.76	0.52	0.007
30 min	98.96	0.61	98.72	0.61	0.172
60 min	98.84	0.55	98.80	0.58	0.804

There was no significant difference (p value>0.05) in mean SpO_2 at 0 minute, 1 minute, 3 minutes, 5 minutes, 10 minutes, 20 minutes, 30 minutes and 60 minutes between Group A and Group B.

Table 6: Comparison of the two group with respect to intubating conditions

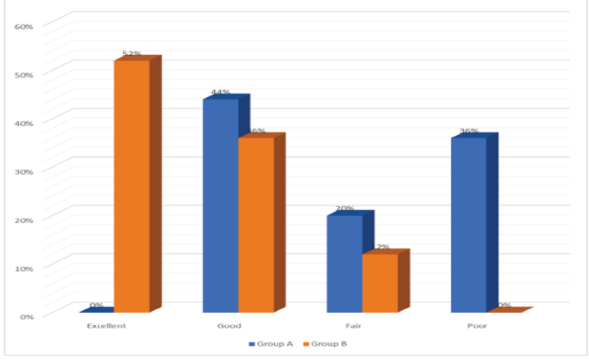
Intubating conditions	Groups		Total
	Group A	Group B	
Grade 1	3	14	17
	12.0%	56.0%	34.0%
Grade 2	15	11	26
	60.0%	44.0%	52.0%
Grade 3	4	0	4
	16.0%	0.0%	8.0%
Grade 4	3	0	3
	12.0%	0.0%	6.0%
Total Patient	25	25	50
	100.0%	100.0%	100.0%
2 value = 14.733, p-value = 0.002*			



The occurrence of Grade 1 Intubating conditions were significantly more among Group B compared to Group A. Whereas Grade 2, 3 and 4 Intubating conditions were significantly (p=0.002) more among Group A compared to Group B.

Table 7: Comparison of the two groups according to post operative patient satisfaction

Post-operative patient satisfaction	Groups		Total
	Group A	Group B	
Excellent	0	13	13
	0.0%	52.0%	26.0%
Good	11	9	20
	44.0%	36.0%	40.0%
Fair	5	3	8
	20.0%	12.0%	16.0%
Poor	9	0	9
	36.0%	0.0%	18.0%
Total patient	25	25	50
	100.0%	100.0%	100.0%
2 value = 32.889, p-value = 0.001*			



Excellent Post-operative patient satisfaction was significantly (p< 0.001) more among Group B compared to Group A.

DISCUSSION:

There was a significant difference (p value<0.05) in mean

haemodynamic parameters (Mean Heart Rate, Diastolic Blood Pressure, Systolic Blood Pressure) between Group A and Group B in our study.This was due to better airway anaesthesia in group B compared to group A, attributing to the fact that the sympathetic response to intubation was diminished better in group B, which was displayed by the hemodynamic parameters at the time and within 10 minutes of intubation. In relation to our findings, *Kundra et al*.[6] found that all of their patients experienced a gradual increase in their heart rate throughout the course of the procedure, albeit the increase was statistically significant and more pronounced in the nebulization group than it was in the regional block group.

In our study, there was significant difference between the two groups regarding the intubating conditions (p value=0.002). The occurrence of Grade 1 Intubating conditions were significantly more among Group B compared to Group A. Whereas Grade 2, 3 and 4 Intubating conditions were significantly more among Group A compared to Group B. In Group A (n=25) 3 patient had grade 1 (optimal) intubating condition, 15 patients had grade 2 (suboptimal) intubating condition, 4 patients had grade 3 (difficult) intubating condition and 3 patients had grade 4 (failure) intubating condition. In Group B (n=25) 14 patient had Grade 1 intubating condition (optimal), 11 patients had Grade 2 intubating condition (sub optimal), and no patient had Grade 3 (difficult) and Grade 4 (failure) intubating condition. The results of this study were comparable to those found in the research conducted by *Webb et al*.[7], *Graham et al*.[8]

In current research work, there was a significant difference between the groups based on post operative patient satisfaction (pvalue=0.001). Excellent Post-operative patient satisfaction was significantly more among Group B compared to Group A. In Group A (n=25), 11 patients (44%) had grade 2 (good) post operative patient satisfaction score, 5 patients (20%) grade 3 (fair) post operative patient satisfaction score, 9 patients (36%) had grade 4 (poor) post operative patient satisfaction score and none patient had grade 1 (excellent) post operative patient satisfaction score. In Group B (n=25), 13 patients (52%), had grade 1 (excellent) post operative patient satisfaction score, 9 patients (36%) had grade 2 (good) post operative patient satisfaction score, 3 patients (12%) had grade 3 (fair) post operative patient satisfaction score and none patient had grade 4 (poor) post operative patient satisfaction score. *Kumar et al*.[9]had a similar observation in their study.

CONCLUSION-:

- There was no significant difference in mean Age and sex between Group A and Group B.
- The haemodynamic parameters (mean Heart Rate, Diastolic Blood Pressure, Systolic Blood Pressure and SpO_2 at different time intervals) differed significantly between Group A and Group B.
- The occurrence of Grade 1 Intubating conditions were significantly more among Group B compared to Group A. Whereas Grade 2, 3 and 4 Intubating conditions were significantly more among Group A compared to Group B.
- Excellent Post-operative patient satisfaction was significantly more among Group B compared to Group A.

REFERENCES:-

1. Apfelbaum JL, Hagberg CA, Caplan RA, Blitt CD, Connis RT, Nickinovich DG, Hagberg CA, Caplan RA, Benumof JL, Berry FA, Blitt CD, Bode RH, Cheney FW, Connis RT, Guidry OF, Nickinovich DG, Ovassapian A., American Society of Anesthesiologists Task Force on Management of the Difficult Airway. 2013 Feb;118(2):251-70.
2. Panchabhai TS, Mehta AC. Historical perspectives of bronchoscopy. Connecting the dots. Ann Am ThoracSoc 2015; 12: 631-41.
3. Díaz-Jimenez JP, Rodriguez AN. Interventions in Pulmonary Medicine. Houston, Springer. 2013, pp 13-31.
4. Ikeda S, Yanai N, Ishikawa S. Flexible bronchofiberscope. Keio J Med 1968; 17: 1-16.
5. Mathur PR, Jain N, Kumar A, Thada B, Mathur V, Garg D. Comparison between lignocaine nebulization and airway nerve block for awake fiberoptic bronchoscopy-guided nasotracheal intubation: a single-blind randomized prospective study. Korean journal of anesthesiology. 2018 Apr 2;71(2):120-6.
6. Kundra P, Kutralam S, Ravishankar M. Local anaesthesia for awake fibreoptic nasotracheal intubation. Acta Anaesthesiol Scand 2000; 44: 511-6
7. Webb AR, Fernando SS, Dalton HR, Arrowsmith JE, Woodhead MA, Cummin AR. Local anaesthesia for fibreoptic 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 anesthesia for fiberoptic bronchoscopy. Chest 1992; 102: 704-7.
9. Kumar MP, Patro M, Panigrahy S, Samal S, Kartheek BS. Comparison between intravenous dexmedetomidine and spray as you go with 4% lignocaine versus intravenous fentanyl and transtracheal injection of 4% lignocaine for awake nasotracheal intubation with flexible vedioscope–A randomized single-blind prospective study. Anesthesia: Essays and Researches. 2021 Apr 1;15(2):213.