International Journal of Scientific Research in Dental and Medical Sciences

www.ijsrdms.com

# Comparison of Two Doses of Nebulized Dexmedetomidine with Lignocaine for Awake Fiberoptic Intubation: A Randomized Double-Blind Trial

Surendra Kumar Sethi *, Abhay Kumar Lodhi, Arti Kuldeep, Sandeep Sharma, Basant Kumar Dindor, Manoj Kumar Jain

*Department of Anaesthesiology, Rabindranath Tagore Medical College, Udaipur, Rajasthan, India*

**ARTICLE INFO**

*Article history:*
Received 11 September 2025
Received in revised form 26 October 2025
Accepted 06 November 2025
Available online 22 November 2025

*Keywords:*
Anesthesia
Dexmedetomidine
Hemodynamics
Intubation
Patient Satisfaction

**ABSTRACT**

**Background and aim:** Nebulized dexmedetomidine is a promising non-invasive technique of topical anesthesia as an adjunct to lignocaine for awake fiberoptic intubation (AFOI). The study aimed to compare two different doses of dexmedetomidine with lignocaine nebulization for AFOI in patients undergoing elective surgery.

**Material and methods:** Ninety-six adult patients of either sex aged 18 to 50 years, belonging to the American Society of Anesthesiologists (ASA) Physical Status (PS) I or II, for AFOI, were enrolled and randomly allocated into three groups of 32 each. Patients received nebulization with either lignocaine alone (Group C) or lignocaine and dexmedetomidine (Groups D1 and D2) for 15 minutes. Cough severity was the primary outcome, while intubation comfort score, post-intubation behavior assessment, patient satisfaction score, Ramsay sedation scale (RSS) score, hemodynamics, and side effects were secondary outcomes.

**Results:** The median cough scores were 2(1-2), 1(1-2) and 1(1-1); median intubation comfort scores were 1(1-2), 1(0-1) and 0(0-0); median post intubation behavior scores were 1(1-2), 1(0-1) and 0(0-0); median postoperative patient satisfaction scores were 2(1-2), 0(0-1) and 0(0-0); and median Ramsay sedation scores were 1(1-2), 2(2-3) and 3(2-3) in Group C, Group D1 and Group D2 respectively and the differences were statistically significant, ($P<0.05$). The difference in hemodynamic parameters was also statistically significant ($P<0.05$).

**Conclusions:** Although both doses of nebulized dexmedetomidine (1 μg/kg and 2 μg/kg) are safe and effective for AFOI, the nebulized dexmedetomidine (2 μg/kg) appears to be more effective for AFOI.

## 1. Introduction

Airway management is a critical component of general anesthesia, essential for maintaining ventilation and oxygenation, delivering anesthetic gases, and preventing aspiration. It is a significant concern for anesthesiologists due to the potential for life-threatening complications when an airway is difficult to manage.[1] Awake fiberoptic intubation (AFOI) is a technique that allows visualization of the vocal cords via either the oral or nasal route, facilitating the passage of an endotracheal tube under direct vision, and is considered the gold standard for managing a recognized difficult airway.[2] The awake technique is preferred over the conventional technique when it is unsafe to anesthetize the patient due to anticipated difficulties in bag-mask ventilation, laryngoscopy, or endotracheal intubation. In addition, the nasal route is usually preferred over the oral route due to its better patient tolerance.[3] A successful AFOI requires appropriate anesthesia of the nose, oropharynx, larynx, and trachea, along with adequate sedation to obtund airway reflexes and minimize patient discomfort.[4] Several techniques are employed for airway anesthesia, including topical application of local anesthetics (LAs) such as sprays, viscous solutions, soaked cotton pledgets, and nebulization. Nebulization with lignocaine is a commonly used technique for topical anesthesia; however, it may be inadequate for some patients.[5, 6] Various drugs, including propofol, benzodiazepines, alpha-2 adrenergic agonists (dexmedetomidine and clonidine), opioids (fentanyl and remifentanil), and N-methyl-D-aspartate receptor antagonists (ketamine and magnesium sulphate), are used for sedation for AFOI. Dexmedetomidine is preferable for AFOI because of its desirable properties, including sedation, amnesia, analgesia, anxiolysis, sympatholysis, and antisialogogue effects, with no respiratory depression or airway obstruction. However, intravenous (IV) administration of dexmedetomidine may lead to hemodynamic changes like hypotension and bradycardia.[7] Nebulized dexmedetomidine is a promising non-invasive technique for topical anesthesia, offering several advantages over IV administration, with favorable bioavailability of 65% and 82% through nasal and buccal mucosa, respectively. Nebulized dexmedetomidine, used as an adjunct to lignocaine nebulization before AFOI, can reduce adverse events during bronchoscopy due to its local action and

* Corresponding author. *Surendra Kumar Sethi*
E-mail address: drsurendrasethi80@gmail.com
Department of Anaesthesiology, Rabindranath Tagore Medical College, Udaipur, Rajasthan, India
https://doi.org/10.30485/IJSRDMS.2026.562631.1689

bronchodilator properties. It also decreases salivary secretions, an advantage during fiberoptic intubation[4], which has been reported to provide a smooth induction of anesthesia, rapid recovery, and minimal side effects in pediatric dental procedures.[8-11] Despite the proven efficacy of IV dexmedetomidine for sedation during AFOI, literature on the nebulized dexmedetomidine-lignocaine combination is limited. Although a few studies have reported the use of this combination with varying doses of dexmedetomidine (0.6 µg/kg - 2.0 µg/kg)[8-11], to date, no study has compared the effectiveness of two different doses (1 µg/kg and 2 µg/kg) of nebulized dexmedetomidine with lignocaine for AFOI. We hypothesized that the combination of nebulized dexmedetomidine with lidocaine would reduce the incidence of moderate-to-severe coughing during AFOI, improve intubation comfort, post-intubation tolerance, and patient satisfaction, while maintaining adequate sedation and stable hemodynamics. So with this hypothesis, the present study was conducted to compare two different doses of dexmedetomidine with lignocaine nebulization for AFOI in patients undergoing elective surgery under general anesthesia, with severity of cough as a primary outcome measure, while intubation comfort score, post-intubation behavior assessment, patient satisfaction score, Ramsay sedation scale (RSS) score, hemodynamics, and side effects or complications as secondary outcome measures.

## 2. Material and methods

### *Ethical approval*

After approval from institutional ethics committee (RNT/ACAD./IEC/2023/650/dated 04.08.2023) and obtaining informed consent from patients, the present study was carried out at our tertiary institute among 96 adult patients of either sex aged between 18 and 50 years belonging to American Society of Anesthesiologists (ASA) Physical Status (PS) I or II and Mallampati[12] Grade I or II undergoing various elective surgeries under general anesthesia with awake fiberoptic nasal endotracheal intubation over a period of six months. The study was registered under the Clinical Trial Registry-India (CTRI/2023/10/059186/dated 27/10/2023).

### *Study population and methodology*

The patients who had not given consent, aged <18 and >50 years, ASA PS III or above, Mallampati Grade III or IV, body mass index >35 kg/m², allergy to study drugs, had nasal infection or complete obstruction or any other contraindication for nasal intubation, resting heart rate <50/min, pregnancy and lactation, any known cardiac, respiratory, renal, or hepatic disease, any psychiatric and neurological disease or seizure disorder, and bleeding disorders were excluded from the study. The study population was randomly allocated into three groups of 32 patients each using computer-generated random numbers, and group allocation concealment was done using the sequentially numbered, opaque sealed envelope technique (Fig. 1). All patients received nebulization with lignocaine 4% (5 ml) (Group C), nebulization with lignocaine 4% + dexmedetomidine 1 µg/kg (5 ml) (Group D1), or nebulization with lignocaine 4% + dexmedetomidine 2 µg/kg (5 ml) (Group D2) over 15 minutes.

After performing a pre-anesthetic evaluation and explaining the AFOI procedure, informed written consent was obtained from all patients. Standard monitoring was attached, and baseline vital parameters, i.e., heart rate (HR), systolic blood pressure (SBP), diastolic blood pressure (DBP), mean arterial pressure (MAP), peripheral oxygen saturation (SpO2), and respiratory rate (RR), were recorded in the anesthesia procedure room. After securing a 20G IV cannula, IV glycopyrrolate (0.005 mg/kg) and midazolam (0.02 mg/kg) were administered as premedication. After testing nasal patency, xylometazoline (0.1%) nasal drops were instilled in the chosen nostril. Patients were nebulized with either lignocaine 4% (LOX, injection; Neon Laboratories Ltd., India) alone or with dexmedetomidine (Dextomid injection, Neon Laboratories Ltd., India) at 1 or 2 µg/kg over 15 minutes using an ultrasonic nebulizer, as per group allocation, to achieve procedural sedation. To ensure double blinding, nebulization was administered by an independent anesthesiologist who was not involved in the study. Fiberoptic intubation was performed by another anesthesiologist, blinded to group allocation, who recorded study parameters. Subsequently, patients were transferred to the operating room, and vital parameters were recorded again. One puff of 10% lignocaine spray was administered over each tonsillar area. An experienced senior anesthesiologist performed the fiberoptic bronchoscopy-guided intubation. A flexible fiberoptic bronchoscope, preloaded with an appropriately sized endotracheal tube (ETT), was used. Endotracheal placement of the ETT was confirmed by capnography. The cough severity score and intubation comfort score evaluated the intubation condition. The cough severity score was graded as: Score 1-No cough, Score 2-Slight cough (no more than 2 coughs in sequence), Score 3 - Moderate cough (3-5 coughs in sequence), and Score 4-Severe cough (>5 coughs in sequence). The intubation comfort score was graded as: Score 0 - no reaction; Score 1-slight grimacing; Score 2-heavy grimacing; Score 3-verbal objection; and Score 4-defensive movements. Tolerance to intubation was evaluated using the post-intubation behavior score, which was graded as: Score 0-Co-operative; Score 1- Restless/Minimal Resistance; Score 2 - Severe resistance/requirement for immediate general anesthesia. Hemodynamic parameters, i.e., HR, SBP, DBP, MAP, SpO2, and RR, were recorded at baseline, after nebulization, immediately after intubation, 1, 3, 5, and 10 min after intubation. Side effects, if any, like nausea/vomiting, bradycardia, hypotension, respiratory depression, or oxygen desaturation, etc., were noted. Hypotension, bradycardia, and desaturation were promptly corrected in accordance with the relevant protocol. Nausea/Vomiting was managed with ondansetron 4 mg IV; bradycardia with atropine 0.6 mg IV; and hypotension with IV fluids and/or mephentermine/ephedrine. Respiratory depression and desaturation were managed with oxygen supplementation or assisted ventilation using Bain's circuit with 100% oxygen. Patient satisfaction score and RSS score were recorded in the postoperative period. The postoperative patient satisfaction score was graded as follows: Score 0-excellent; Score 1-good; Score 2-reasonable/fair; Score 3-poor. The level of sedation was assessed using RSS score[13] which was graded as: Score 1-Anxious, agitated or restless, Score 2- Co-operative, oriented and tranquil, Score 3- Sedated but responds to command, Score 4-Asleep, brisk glabellar reflex, responds to loud noise, Score 5- Asleep, sluggish glabellar reflex, responds to loud noise and Score 6- Asleep with no response to a painful stimulus.

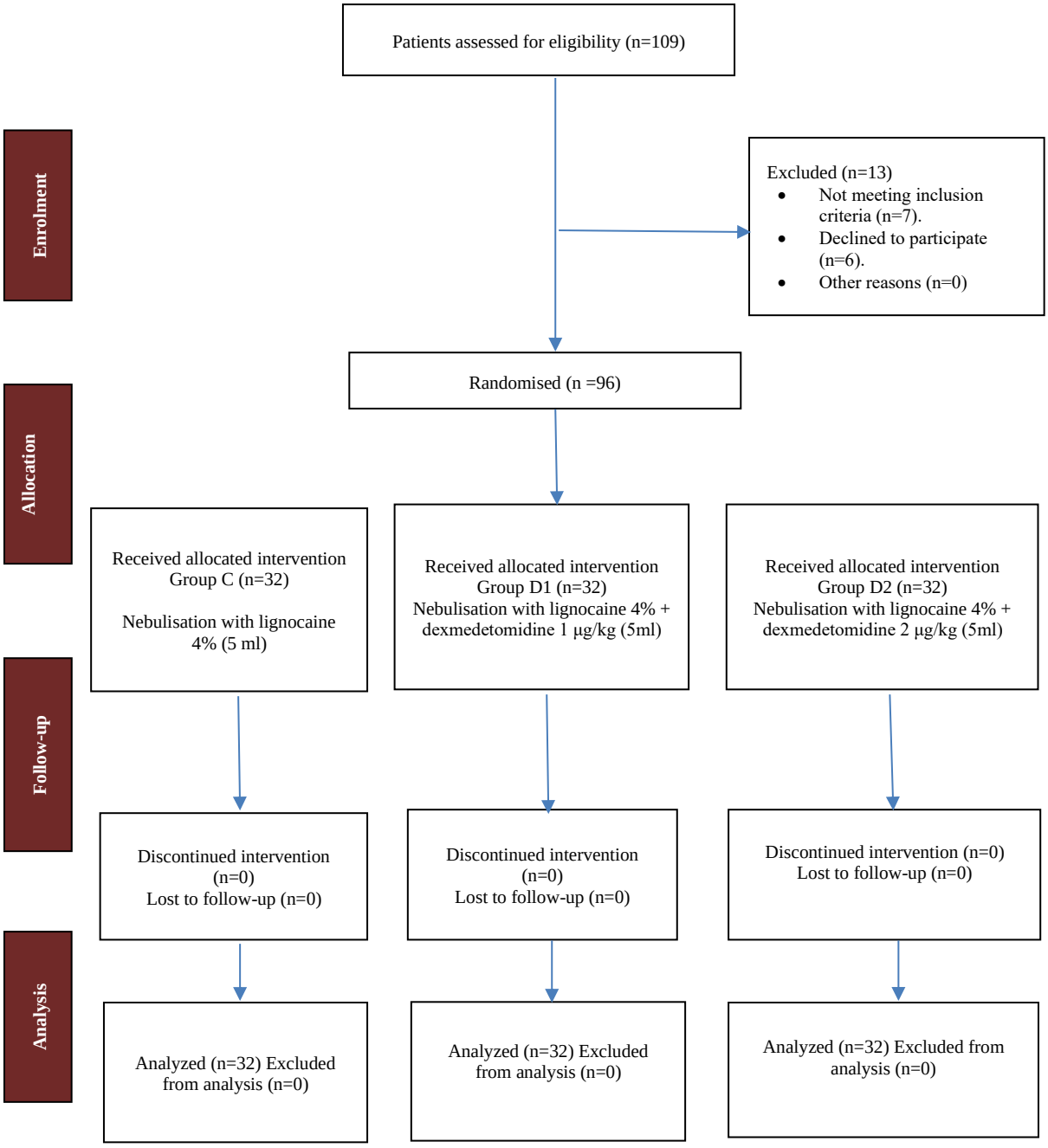


**Fig. 1. Consort flow diagram.**

***Statistical analysis***

For the sample size calculation, the cough score was assumed to be 0.8 higher in the control group than in the study group. A sample size of 29 patients per group was required. After accounting for 10% dropouts, a total of 96 patients were required, with 32 patients per group, for 80% power and 5% alpha error. Continuous variables were presented as mean ± standard deviation (SD) and compared using Student's t-test and analysis of variance (ANOVA). Ordinal data were presented as median ± interquartile range (IQR) and analyzed using the Mann-Whitney U test and the Kruskal-Wallis test. Categorical data were presented as numbers (proportions) and compared with the chi-square test. Statistical analysis was done using the Statistical Package for Social Sciences (SPSS) version 25 software. $P<0.05$ and $P<0.01$ were considered statistically significant and statistically highly significant, respectively.

## 3. Results

The three study groups were comparable with respect to demographic profile, ASA-PS classification, and modified Mallampati Grade ($P > 0.05$). (Table 1)

Table 1. Demographic profile among three study groups.

| Variables | Group C (n=32) | Group D1 (n=32) | Group D2 (n=32) |
|---|---|---|---|
| Age (in years) | 38.03±7.79 | 35.09±10.92 | 37.56±10.37 |
| Weight (in kg) | 56.93±10.56 | 56.75±9.34 | 58.59±12.82 |
| Sex (M/F) | 19/13 | 16/16 | 12/20 |
| ASA PS I/II | 21/11 | 23/9 | 20/12 |
| MMP Grade I/II | 15/17 | 16/16 | 14/18 |

* Data presented as Mean±standard deviation and number.

†Group C- Control group; Group D1- Dexmedetomidine 1 µg/kg group; Group D2- Dexmedetomidine 2µg/kg group; ASA PS- American Society of Anesthesiologists Physical Status; MMP- Modified Mallampati.

The median cough scores were 2(1-2), 1(1-2), and 1(1-1) in Group C, Group D1, and Group D2 respectively. The median scores differed significantly among the three groups (P<0.05). Patients with higher median cough score were more in Group C than in Group D1 and Group D2 (P<0.05), and in Group D1 than in Group D2 (P<0.05) [Group C > Group D1 > Group D2]. (Table 2) (Fig. 2) The median intubation comfort scores were 1(1-2), 1(0-1), and 0(0-0) in Group C, Group D1, and Group D2 respectively. The median intubation comfort scores differed significantly among the three groups (P<0.001).The median post-intubation behavior scores were 1(1-2), 1(0-1), and 0(0-0) in Group C, Group D1, and Group D2 respectively. The median post-intubation behavior scores differed significantly among the three groups (P<0.01). (Table 2) (Fig. 2) The median postoperative patient satisfaction scores were 2(1-2), 0(0-1), and 0(0-0) in Group C, Group D1, and Group D2 respectively. Similarly, the median RSS scores were 1(1-2), 2(2-3), and 3(2-3) in Group C, Group D1, and Group D2 respectively. The difference in median postoperative patient satisfaction scores and RSS scores was also statistically significant among the three groups (P<0.01). (Table 2) (Fig. 2)

Table 2. Comparison of different parameters among the three study groups.

| Parameters | Group C (n=32) | Group D1 (n=32) | Group D2 (n=32) | P-value | P-value | | |
|---|---|---|---|---|---|---|---|
| | | | | | C/D1 | C/D2 | D1/D2 |
| Cough severity score (1-4) | 2(1-2) | 1(1-2) | 1(1-1) | 0.0114 | 0.0226 | < 0.001 | 0.035 |
| Intubation comfort score (0-4) | 1(1-2) | 1(0-1) | 0(0-0) | < 0.001 | < 0.001 | < 0.001 | 0.004 |
| Post intubation behavior score (0-2) | 1(1-2) | 1(0-1) | 0(0-0) | < 0.001 | < 0.001 | < 0.001 | 0.010 |
| Postoperative patient satisfaction score (0-3) | 2(1-2) | 0(0-1) | 0(0-0) | < 0.001 | < 0.001 | < 0.001 | 0.003 |
| Ramsay sedation score (1-6) | 1(1-2) | 2(2-3) | 3(2-3) | < 0.001 | < 0.001 | < 0.001 | 0.007 |

* Data presented as Median (Interquartile range).

†Group C- Control group; Group D1- Dexmedetomidine 1 µg/kg group; Group D2- Dexmedetomidine 2µg/kg group; ASA PS- American Society of Anesthesiologists Physical Status; MMP- Modified Mallampati.

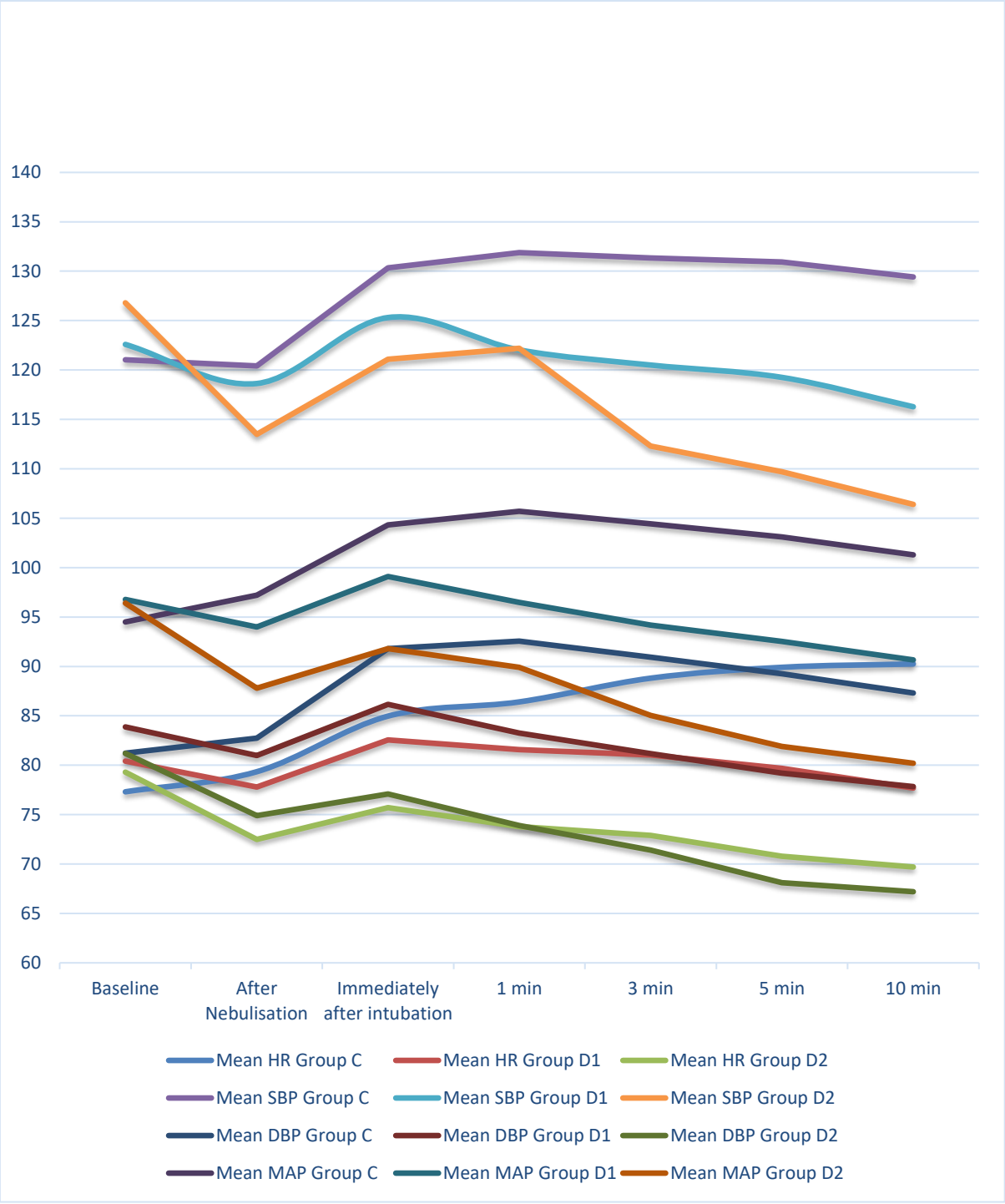


Fig. 2. Comparison of hemodynamic parameters among three study groups.
HR: heart rate, MAP: mean arterial pressure, SBP: systolic blood pressure, DBP: diastolic blood pressure.

Compared with hemodynamic parameters, differences in mean HR, mean SBP, mean DBP, and MAP were statistically significant at different time points across the three study groups ($P<0.05$). Similarly, differences in mean HR, mean SBP, mean DBP, and MAP from baseline were statistically significant at different time points in all three study groups ($P < 0.05$). In Group C, the mean HR, mean SBP, mean DBP, and MAP were significantly increased from baseline and remained elevated for 10 min after intubation ($P<0.05$). However, in Group D1, these were comparable to baseline at all time intervals after nebulization, after intubation, and at 1, 3, 5, and 10 min after intubation ($P>0.05$). In Group D2, these parameters decreased from baseline after nebulization and remained lower than baseline at all time intervals ($P<0.05$). (Fig. 3) The difference in the incidence of postoperative side effects/complications was found to be statistically insignificant among the three study groups ($P>0.05$). (Table 3)

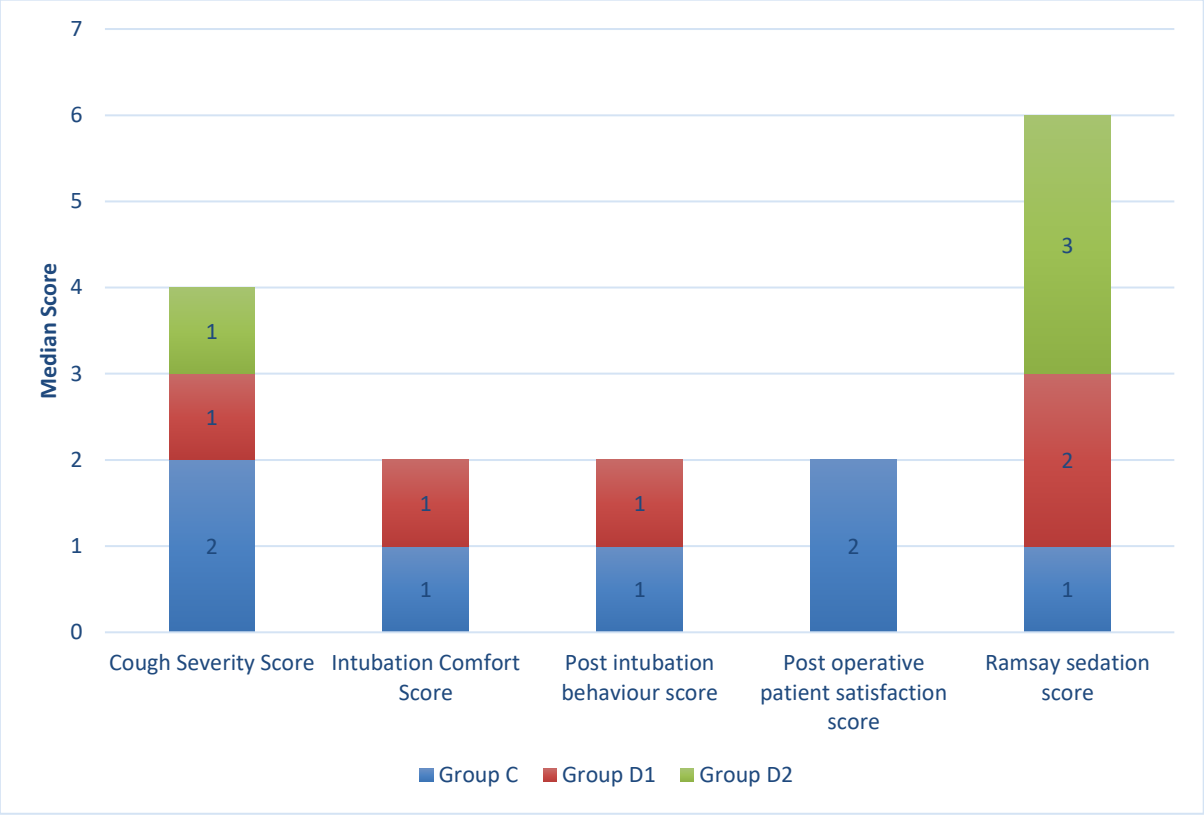


Fig. 3. Comparison of median scores of different parameters among three study groups.

Table 3. Incidence of postoperative side effects/complications among three study groups.

| Side effects / Complications | Group C (n=32) | Group D1 (n=32) | Group D2 (n=32) |
|---|---|---|---|
| Nausea/Vomiting | 0 (0%) | 0 (0%) | 0 (0%) |
| Bradycardia | 0 (0%) | 0 (0%) | 2 (6.25%) |
| Hypotension | 0 (0%) | 0 (0%) | 3 (9.37%) |
| Respiratory depression | 0 (0%) | 0 (0%) | 0 (0%) |
| Hypoxemia | 0 (0%) | 0 (0%) | 0 (0%) |

* Data presented as number (percentage).

†Group C- Control group; Group D1- Dexmedetomidine 1 µg/kg group; Group D2- Dexmedetomidine 2µg/kg group; ASA PS- American Society of Anesthesiologists Physical Status; MMP- Modified Mallampati.

## 4. Discussion

The present study demonstrated that nebulized dexmedetomidine, particularly at a dose of 2 μg/kg, was more effective than 1 μg/kg and lignocaine alone for awake fiberoptic intubation (AFOI). Patients receiving 2 μg/kg experienced less coughing, better intubation conditions, improved tolerance, higher satisfaction, adequate sedation, and more stable hemodynamics with minimal adverse effects. Cough suppression is an important determinant of successful AFOI. In the present study, cough severity was significantly reduced in both dexmedetomidine groups, with the greatest reduction observed in the 2 μg/kg group. These findings are consistent with previous studies reporting improved cough suppression with nebulized dexmedetomidine, particularly at higher doses.[4, 7–12] The favorable effect may be attributed to its high mucosal bioavailability, bronchodilatory action, and sedative and anxiolytic properties.[15-23] Better cough control was associated with significantly improved intubation comfort and post-intubation tolerance, particularly in the 2 μg/kg group. Similar observations have been reported in previous studies evaluating nebulized dexmedetomidine for AFOI and flexible bronchoscopy.[4, 7-11] Patients receiving dexmedetomidine also demonstrated higher postoperative satisfaction and deeper but appropriate conscious sedation, with the highest scores observed in the 2 μg/kg group. These findings agree with previous reports demonstrating dose-dependent improvements in sedation and patient satisfaction.[4, 7-12, 14] Hemodynamic responses during and after intubation remained more stable in the dexmedetomidine groups, especially with the higher dose. While intravenous dexmedetomidine has been associated with hypotension and bradycardia, nebulized administration appears to provide effective sympatholysis with fewer clinically significant cardiovascular effects.[7, 8, 10-12,18-22] The present study has several limitations. Patients with anticipated difficult airways and significant comorbidities were excluded, intubation time and plasma drug concentrations were not measured, and only elective adult patients were included. Therefore, further multicenter randomized trials involving high-risk populations are required to confirm these findings and determine the optimal nebulized dose for AFOI.

## 5. Conclusion

Although both doses of nebulized dexmedetomidine (1 μg/kg and 2 μg/kg) are safe and effective to be used for AFOI, but the nebulized dexmedetomidine (2 μg/kg) appears to be more effective than its lower dose (1 μg/kg) for AFOI in terms of less cough severity, better intubation conditions and tolerance to intubation, improved patient satisfaction, optimal sedation along with stable hemodynamics and minimal side effects. So, dexmedetomidine (2 μg/kg) can be used effectively for AFOI via the nebulized route.

## Conflict of Interest

The authors declared that there is no conflict of interest.

## Acknowledgments

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

## References

[1] Khandelwal M, Saini VK, Kothari S, Sharma G. Role of lignocaine nebulization as an adjunct to airway blocks for awake fiber-optic intubation: a comparative study. Anesthesia Essays and Researches. 2018;12(3):735-41. https://doi.org/10.4103/aer.AER_112_18.

[2] Eldemrdash A. A comparative study between dexmedetomidine versus fentanyl on intubating conditions and side effects during awake fiberoptic nasal intubation under topical anesthesia in patients underwent elective surgical operation. Open Journal of Anesthesiology. 2017;7:415-25. https://doi.org/10.4236/ojanes.2017.712043.

[3] Kini P, Umesh G, Prasad K, Kini K. Comparison of intubating conditions using'spray-as-you-go'technique versus transtracheal instillation of lignocaine for airway topical anesthesia during awake nasal fiberoptic intubation. Indian Journal of Respiratory Care. 2021;10(1):82.

[4] Kumari P, Kumar A, Sinha C, Kumar A, Rai DK, Kumar R. Fentanyl vs dexmedetomidine nebulization as adjuvant to lignocaine: A comparative study during awake flexible fiberoptic bronchoscopy. Trends in Anaesthesia and Critical Care. 2021;37:18-22. https://doi.org/10.1016/j.tacc.2020.09.009.

[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;71(2):120-6. https://doi.org/10.4097/kjae.2018.71.2.120.

[6] Hassanein A, Talaat M, Shehatah O. Airway nerve blocks as an adjunct to lignocaine nebulization for awake fiberoptic intubation. Egyptian Journal of Anaesthesia. 2020;36(1):162-9.

[7] Sancheti AG, Swami SS, Konnur SL, Amin N. A comparative study between local dexmedetomidine and intravenous dexmedetomidine during awake fiberoptic nasotracheal intubation. Anesthesia Essays and Researches. 2022;16(3):407-11. https://doi.org/10.4103/aer.aer_140_22.

[8] Kumar A, Kumari P, Sinha C, Kumar A, Kumar R, Kumar A. Dexmedetomidine nebulization as adjuvant to lignocaine during awake flexible fiberoptic intubation. Saudi Journal of Anaesthesia. 2019;13(2):152-3. https://doi.org/10.4103/sja.SJA_579_18.

[9] Antony T, Acharya VK, Acharya PR. Effectiveness of nebulized dexmedetomidine as a premedication in flexible bronchoscopy in Indian patients-a prospective, randomized, double-blinded study. Contemporary Clinical Trials Communications. 2023;33:101111. https://doi.org/10.1016/j.conctc.2023.101111.

[10] Gaikawad J, Choudhary S, Sharma S, Meena K, Verma D, Bedi V. Comparative evaluation of lignocaine nebulization with and without dexmedetomidine for flexible videoendoscopic guided awake nasal intubation for general anaesthesia. Journal of Anaesthesiology Clinical Pharmacology. 2023;39(3):372-8. https://doi.org/10.4103/joacp.joacp_483_21.

[11] Gu W, Xu M, Lu H, Huang Q, Wu J. Nebulized dexmedetomidine-lidocaine inhalation as a premedication for flexible bronchoscopy: a randomized trial. J Thorac Dis 2019;11:4663-70. https://doi.org/10.21037/jtd.2019.10.59

[12] Kumar A, Kumari P, Sinha C, Kumar A, Karmakar S. Effect of different doses of dexmedetomidine as an adjuvant to lignocaine nebulization: A comparative study during awake flexible fiberoptic bronchoscopy. J Anaesthesiol Clin Pharmacol 2024;40:56-62. https://doi.org/10.4103/joacp.joacp_60_22

[13] Harjai M, Alam S, Bhaskar P, Harjai M, Alam Sr S. Clinical relevance of Mallampati grading in predicting difficult intubation in the era of various new clinical predictors. Cureus. 2021;13(7):e16396. https://doi.org/10.7759/cureus.16396.

[14] Dawson R, von Fintel N, Nairn S. Sedation assessment using the Ramsay scale. Emergency Nurse. 2010;18(3):18-20. https://doi.org/10.7748/en2010.06.18.3.18.c7825.

[15] Anupriya J, Kurhekar P. Randomised comparison between the efficacy of two doses of nebulised dexmedetomidine for premedication in paediatric patients. Turkish Journal of Anaesthesiology and Reanimation. 2019;48(4):314-20. https://doi.org/10.5152/TJAR.2019.78889.

[16] Zanaty OM, El Metainy SA. A comparative evaluation of nebulized dexmedetomidine, nebulized ketamine, and their combination as premedication for outpatient pediatric dental surgery. Anesthesia & Analgesia. 2015;121(1):167-71. https://doi.org/10.1213/ANE.0000000000000728.

[17] Kumar NR, Jonnavithula N, Padhy S, Sanapala V, Naik VV. Evaluation of nebulised dexmedetomidine in blunting haemodynamic response to intubation: A prospective randomised study. Indian journal of anaesthesia. 2020;64(10):874-9. https://doi.org/10.4103/ija.IJA_235_20.

[18] Liu HH, Zhou T, Wei JQ, Ma WH. Comparison between remifentanil and dexmedetomidine for sedation during modified awake fiberoptic intubation. Experimental and therapeutic medicine. 2015;9(4):1259-64. https://doi.org/10.3892/etm.2015.2288.

[19] Srinivas C, Tiwari T, Prakash R, Prabha R, Raman R, Arshad Z. A randomized comparison of intravenous versus nebulized routes for administering Dexmedetomidine and ketamine combination to facilitate awake fibreoptic intubation. Cureus. 2023;15(4):e38322. https://doi.org/10.7759/cureus.38322.

[20] Kaur M, Kumar P, Rekhi BK, Priyaa Cathrine K. Efficacy of Intranasal Dexmedetomidine with Lidocaine Versus Intranasal Lidocaine Alone in Awake Fiberoptic Nasotracheal Intubation A Randomised Clinical Study. Journal of Clinical & Diagnostic Research. 2022;16(8).

[21] Mondal S, Ghosh S, Bhattacharya S, Choudhury B, Mallick S, Prasad A. Comparison between dexmedetomidine and fentanyl on intubation conditions during awake fiberoptic bronchoscopy: A randomized double-blind prospective study. Journal of Anaesthesiology Clinical Pharmacology. 2015;31(2):212-6. https://doi.org/10.4103/0970-9185.155151.

[22] Misra S, Behera BK, Mitra JK, Sahoo AK, Jena SS, Srinivasan A. Effect of preoperative dexmedetomidine nebulization on the hemodynamic response to laryngoscopy and intubation: a randomized control trial. Korean journal of anesthesiology. 2021;74(2):150-7. https://doi.org/10.4097/kja.20153.

[23] Niyogi S, Biswas A, Chakraborty I, Chakraborty S, Acharjee A. Attenuation of haemodynamic responses to laryngoscopy and endotracheal intubation with dexmedetomidine: A comparison between intravenous and intranasal route. Indian journal of anaesthesia. 2019;63(11):915-23. https://doi.org/10.4103/ija.IJA_320_19.

**How to Cite this Article:** Sethi SK, Lodhi AK, Kuldeep A, Sharma S, Dindor BK, Jain MK. Comparison of Two Doses of Nebulized Dexmedetomidine with Lignocaine for Awake Fiberoptic Intubation: A Randomized Double-Blind Trial. International Journal of Scientific Research in Dental and Medical Sciences. 2025;7(4):182-189. https://doi.org/10.30485/IJSRDMS.2026.562631.1689.