

COMPARATIVE EVALUATION OF PROSEAL LMA INSERTION CONDITION USING DEXMEDETOMIDINE - PROPOFOL Vs FENTANYL-PROPOFOL IN ELECTIVE SURGERIES PERFORMED UNDER GENERAL ANESTHESIA

Bhuvaneswari S¹, Madhubala A², Balasubramaniaguhan V³

Received : 13/09/2025
Received in revised form : 01/11/2025
Accepted : 18/11/2025

Keywords:
Dexmedetomidine, Propofol, Fentanyl,
Laryngeal Mask Airway,
Haemodynamic, Anaesthesia.

Corresponding Author:
Dr. Bhuvaneswari S,
Email: bhuviyashika@gmail.com

DOI: 10.47009/jamp.2025.7.6.64

Source of Support: Nil,
Conflict of Interest: None declared

Int J Acad Med Pharm
2025; 7 (6); 327-332



¹Senior Resident, Department of Anaesthesiology and Critical Care, Jawaharlal Institute of Postgraduate Medical Education & Research, Puducherry, India

²Assistant Surgeon, Department of Anaesthesiology, Government Hospital, Anaicut, Vellore, Tamilnadu, India

³Assistant Professor, Department of Anaesthesia Kapv Government Medical College Trichy, Tamilnadu, India

ABSTRACT

Background: The ProSeal Laryngeal Mask Airway (PLMA) is widely used for airway management during short surgical procedures. Optimal insertion requires adequate anaesthetic depth and haemodynamic stability. Dexmedetomidine and fentanyl are commonly used with propofol to improve insertion conditions. This study compared dexmedetomidine–propofol and fentanyl–propofol combinations for PLMA insertion. **Materials and Methods:** A prospective, double-blind, randomised study was conducted at Mahatma Gandhi Memorial Hospital, Trichy, from February 2020 to September 2021, on 60 ASA I–II patients undergoing elective breast surgeries. Patients received either dexmedetomidine propofol (Dp) or fentanyl propofol (Fp), and insertion conditions, haemodynamic, respiratory parameters, and complications were statistically analysed. **Result:** Baseline characteristics were comparable between groups ($p > 0.05$). Optimal jaw relaxation was achieved in 93.3% of Group Dp and 66.7% of Group Fp ($p = 0.062$). Absence of cough was higher in Group Dp (96.7%) than in Group Fp (66.7%; $p = 0.026$). First-attempt success was 100% in Group Dp and 86.7% in Group Fp ($p = 0.038$). Group Dp showed significantly lower heart rates after drug administration ($p < 0.05$) and more stable systolic and diastolic pressures during observation. Oxygen saturation remained higher in Group Dp ($p < 0.01$), with higher respiratory rates (RR) maintained throughout ($p < 0.001$). Complications were none in Group Dp (0%) than in Group Fp (13.3%; $p = 0.117$). **Conclusion:** Dexmedetomidine propofol shows smoother insertion, superior haemodynamic, respiratory stability, and no complications, supporting its use for PLMA insertion in elective surgeries.

INTRODUCTION

An advanced supraglottic airway device, the ProSeal Laryngeal Mask Airway (PLMA), was introduced by Archie Brain in 2000 and is used during brief surgical procedures under general anaesthesia. It permits gastric drainage, ensures stable hemodynamics, and provides efficient ventilation with minimal airway trauma while offering a safe airway seal.^[1] The PLMA, an upgraded version of the traditional Laryngeal Mask Airway (LMA), features a drain tube and improved cuff design. Compared to an endotracheal tube, the LMA is simpler to use and requires less experience. It is suitable for emergencies, challenging airways, and brief surgical procedures because its insertion requires less muscle

relaxation and a lower depth of anaesthesia.^[2] A sufficient depth of anaesthesia is necessary for successful insertion to relax the jaw muscles and inhibit airway reflexes, preventing coughing, gagging, and movement.^[3]

Although it has a slower onset, requires higher concentrations, is more expensive, and pollutes the theatre, inhalational induction with volatile anaesthetic agents can achieve sufficient depth for airway insertion. Despite its effectiveness in certain situations, it is less popular for routine adult airway management.^[4] Compared to endotracheal intubation, the LMA provides a dependable airway with fewer complications and less hemodynamic disturbance. Research indicates that, compared to tracheal intubation and laryngoscopy, LMA insertion causes fewer cardiovascular changes in adults.^[5,6]

To achieve the desired depth of anaesthesia while minimising side effects, co-induction involves giving a small dose of a sedative or anaesthetic before the main induction agent.^[6] This method decreases the primary agent dose, enhances jaw relaxation, and makes airway insertion smoother. It also preserves hemodynamic stability while reducing adverse effects such as injection pain, fentanyl-induced cough, and delayed recovery.^[7] Cardiovascular changes caused by laryngoscopy require a sufficient depth of anaesthesia. Adjuvant agents enhance anaesthesia quality and reduce the required induction drug dose. Dexmedetomidine, an α_2 -adrenoceptor agonist, lowers the need for propofol and helps maintain hemodynamic stability, while fentanyl, often combined with propofol, can cause chest wall rigidity.^[8]

The opioid fentanyl improves insertion conditions and effectively relieves pain, but can cause respiratory depression.^[9] Dexmedetomidine, a selective α -adrenoceptor agonist, provides sedation and analgesia with minimal respiratory depression. Reducing stress responses during surgery and airway manipulation preserves hemodynamic stability.^[10] Both drugs enhance insertion conditions and hemodynamic control when combined with propofol; however, dexmedetomidine offers better respiratory preservation.^[11]

Blood pressure and heart rate can change as a result of PLMA insertion. For stable hemodynamics and smooth insertion, the optimal co-induction combination must be selected. This study evaluates the ease of insertion and hemodynamic responses of fentanyl propofol, and dexmedetomidine propofol combinations for PLMA insertion in elective surgeries.

MATERIALS AND METHODS

This prospective, double-blinded, randomised controlled study was conducted at Mahatma Gandhi Memorial Hospital, Trichy, from February 2020 to September 2021, involving 60 participants. Ethical approval was obtained from the Institutional Ethics Committee before commencing the study, and informed consent was obtained from all participants.

Inclusion criteria

Patients classified as ASA physical status I, aged between 18 and 60 years, weighing 30 to 70 kg, and with Mallampati class I scheduled for elective superficial breast surgeries, such as excision of fibro adenoma or Webster's operation for gynecomastia, were included.

Exclusion criteria

Patients with ASA physical status from II and Mallampati class from II, those with asthma, respiratory or oropharyngeal disorders, on antihypertensive therapy, at risk of aspiration, with known drug allergies, or who declined participation were excluded.

Methods: Group Fp (Propofol with Fentanyl) and Group Dp (Propofol with Dexmedetomidine) each included 30 patients. One day before surgery, informed consent and a pre-anaesthesia evaluation were obtained. After fasting for ten hours, patients were taken to the operating room, connected to monitors, and baseline measurements such as NIBP, pulse rate, and SpO₂ were recorded. All patients received 30 minutes before surgery, premedication with Glycopyrrolate 0.2 mg IM, Ranitidine 50 mg IV, and Ondansetron 4 mg IV. Group Dp received 1 μ g/kg of dexmedetomidine, and Group Fp received 2 μ g/kg of fentanyl, both diluted in 100 ml of normal saline and infused over 10 minutes. To ensure blinding, an independent anaesthesiologist prepared and administered the study medications unlabelled.

Data collected included demographic information, jaw relaxation and coughing scores, number of insertion attempts, placement adequacy, complications such as blood-stained LMA, bronchospasm, or laryngospasm, and hemodynamic parameters recorded at intervals. After the study medication, 2 mg/kg IV propofol was given. After 90 seconds, the ProSeal LMA was inserted using the introducer technique, and the ease of insertion was assessed. Placement was confirmed by auscultation, chest movement, and capnography. Failed insertions were managed with an additional 0.5 mg/kg dose of propofol or endotracheal intubation. Anaesthesia was maintained with oxygen, nitrous oxide, sevoflurane, and injection of Vecuronium bromide 0.1 mg/kg, and reversed at the end with injection of Neostigmine 50 μ g/kg and injection of Glycopyrrolate 10 μ g/kg before LMA removal. Bradycardia was treated with Inj. Atropine 0.6 mg IV, and hypotension was managed with Inj. Ephedrine 6 mg IV.

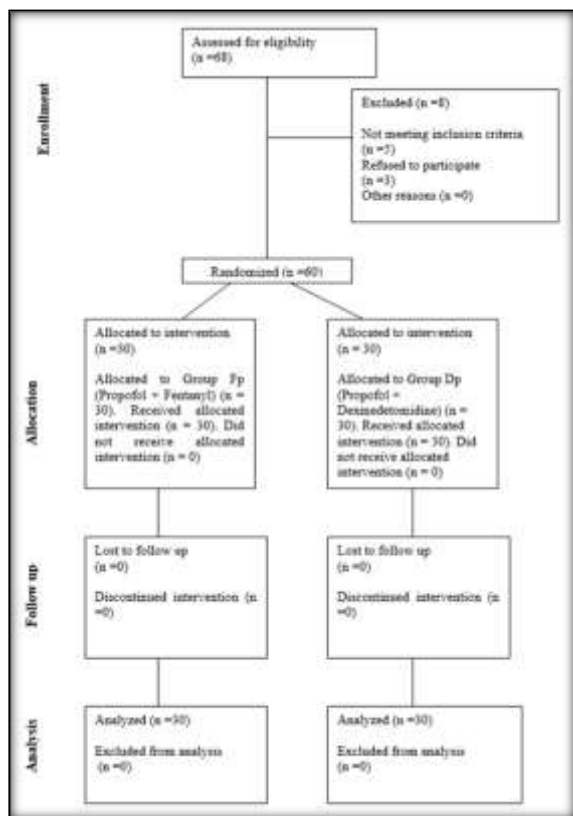


Figure 1: Consort diagram

Statistical analysis

Data were analysed using IBM SPSS Statistics version 27. Continuous variables were expressed as mean $\pm$ standard deviation (SD), and categorical variables as frequencies and percentages. Comparative analysis was done by student's t-test for parametric data and chi-square test for nonparametric data, with p-values ≤ 0.05 considered statistically significant.

RESULTS

Mean age was 27.63 ± 4.71 (Fp) vs. 26.90 ± 5.16 years (Dp; $p = 0.568$), and weight 50.40 ± 5.73 vs. 49.60 ± 6.16 kg ($p = 0.605$). Most were female (93.3% vs. 90%; $p = 0.64$). Fibro adenoma and excision biopsy predominated in both groups, with similar surgery duration (47.67 ± 9.35 vs. 48 ± 8.46 min; $p = 0.885$) [Table 1].

Table 1: Comparison of demographic and baseline characteristics between groups

Variable	Group Fp	Group Dp	P-value
Age (years)	27.63 ± 4.71	26.90 ± 5.16	0.568
Weight (kg)	50.40 ± 5.73	49.60 ± 6.16	0.605
Gender	Male	2 (6.7%)	0.64
	Female	28 (93.3%)	
ASA status (I)	30 (100%)	30 (100%)	-
Mallampati class (I)	30 (100%)	30 (100%)	-
Diagnosis	Fibro adenoma	28 (93.3%)	0.64
	Gynecomastia	2 (6.7%)	
Type of Procedure	Excision biopsy	28 (93.3%)	0.64
	Webster operation	2 (6.7%)	
Duration of surgery (min)	47.67 ± 9.35	48 ± 8.46	0.885

Group Dp showed better insertion conditions, with optimal jaw relaxation in 93.3% vs. 66.7% ($p = 0.062$), absence of cough in 96.7% vs. 66.7% ($p = 0.026$), and first-attempt success in 100% vs. 86.7%

($p = 0.038$). Adequate ventilation occurred in 93.3% vs. 76.7% ($p = 0.175$), and complications were none in Group Dp (0%) compared to Group Fp (13.3%; $p = 0.117$) [Table 2].

Table 2: Comparison of airway management parameters between groups

Variable	Group Fp	Group Dp	p-value
Jaw relaxation grading	Grade 1	20 (66.7%)	0.062
	Grade 2	6 (20%)	
	Grade 3	2 (6.7%)	
	Grade 4	2 (6.7%)	
Cough grading	Grade 1	20 (66.7%)	0.026
	Grade 2	6 (20%)	
	Grade 3	3 (10%)	
	Grade 4	1 (3.3%)	
Number of attempts	1 attempt	26 (86.7%)	0.038
	2 attempt	4 (13.3%)	
Adequacy of ventilation	Grade 1	23 (76.7%)	0.175
	Grade 2	6 (20%)	
	Grade 3	1 (3.3%)	
Incidence of complications	None	26 (86.7%)	0.117
	Mild	1 (3.3%)	
	Severe	3 (10%)	
Unacceptable for LMA insertion	Yes	9 (30%)	0.117

	None	21 (70%)	26 (86.7%)	
--	------	----------	------------	--

The mean heart rate was comparable at baseline between Group Fp (92.83 ± 13.86 bpm) and Group Dp (89.50 ± 12.54 bpm; $p = 0.333$). After drug administration, Group Dp showed a significant reduction (83.57 ± 18.69 bpm) vs Group Fp (94.53 ± 16.19 bpm; $p = 0.018$). This difference continued before LMA insertion (76.77 ± 12.72 vs 89.23 ± 14.05 bpm; $p = 0.001$) and after insertion (83.60 ± 15.20 vs 95.07 ± 15.22 bpm; $p = 0.005$). Throughout the observation period, heart rate remained significantly lower in Group Dp compared to Group Fp at 1 to 60 min ($p < 0.05$) [Figure 2].

Ephedrine usage was higher in Group Dp (3.20 ± 3.77 mg) than in Group Fp (1.60 ± 2.70 mg; $p = 0.064$). Atropine was required only in Group Dp (0.08 ± 0.21 mg), with none used in Group Fp ($p = 0.039$) [Table 3].

Table 3: Comparison of ephedrine and atropine usage between the groups

Variable	Group Fp	Group Dp	P value
Ephedrine usage	1.60 ± 2.7	3.2 ± 3.77	0.064
Atropine usage	0	0.08 ± 0.21	0.039

At baseline, SBP was similar between Group Fp (116.23 ± 8.76 mmHg) vs Group Dp (117.03 ± 7.95 mmHg; $p = 0.713$). After LMA insertion, Group Dp showed consistently lower SBP compared to Group Fp, with significant differences observed from 1 minute ($p = 0.005$) to 40 minutes ($p < 0.001$). Differences were not significant at 50 minutes ($p = 0.304$) and 60 minutes ($p = 0.051$) [Figure 3].

At baseline, DBP was comparable between Group Fp (74.13 ± 5.84 mmHg) vs Group Dp (73.97 ± 6.91 mmHg; $p = 0.920$). After LMA insertion, Group Dp showed consistently lower DBP compared to Group Fp, with significant differences from 1 minute ($p = 0.040$) to 60 minutes ($p = 0.001$). The differences occurred at 3 minutes ($p < 0.001$) and 20 minutes ($p < 0.001$) [Figure 4].



Figure 3: Distribution of SBP between groups

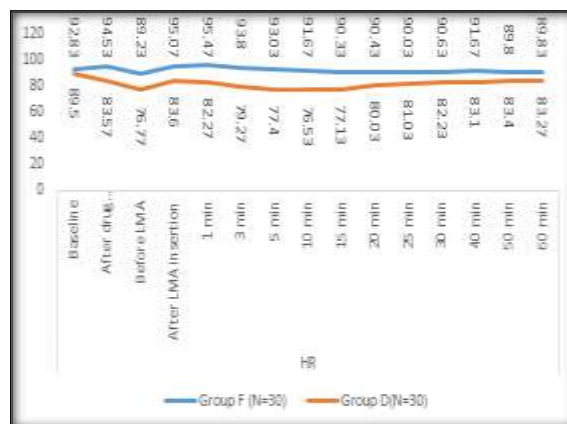


Figure 2: Distribution of HR changes between the groups.



Figure 4: Distribution of diastolic blood pressure between groups



Figure 5: Distribution of SpO2 between groups

At baseline, mean SpO₂ was slightly lower in Group Fp ($98.80 \pm 0.81\%$) compared with Group Dp ($99.40 \pm 0.67\%$; $p = 0.003$). After drug administration, Group Fp recorded $99.97 \pm 0.18\%$ vs $99.70 \pm 0.47\%$ in Group Dp ($p = 0.005$). Both groups maintained full saturation (100%) before and after LMA insertion. During subsequent intervals, SpO₂ remained consistently higher in Group Dp at 5 min to 50 min ($p < 0.05$). At 60 min, SpO₂ values were comparable between both groups ($p = 0.321$) [Figure 5].

At baseline, respiratory rates (RR) were similar between Group Fp (15.50 ± 2.32 breaths/min) and

Group Dp (15.40 ± 1.54 breaths/min; $p = 0.845$). Following drug administration, Group Dp consistently showed higher RR than Group Fp at all measured intervals 30 seconds (10.10 ± 3.11 vs. 5.10 ± 2.98), 1 min (10.30 ± 2.05 vs. 5.33 ± 2.14), 2 min (11.67 ± 2.01 vs. 6.43 ± 2.57), 3 min (11.63 ± 1.75 vs. 7.63 ± 2.28), 5 min (12.80 ± 1.75 vs. 9.03 ± 2.93), 10 min (14.40 ± 1.83 vs. 10.60 ± 1.59), 15 min (15.57 ± 1.81 vs. 11.53 ± 1.50), and 25 min (16.53 ± 2.00 vs. 12 ± 1.11) shows ($p < 0.05$) [Figure 6].

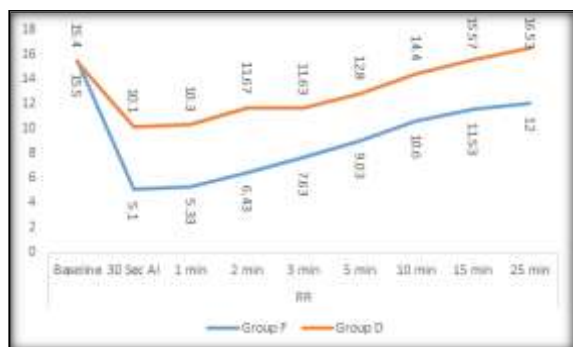


Figure 6: Distribution of respiratory rate between groups

DISCUSSION

This study compares dexmedetomidine propofol, and fentanyl propofol combinations for PLMA insertion in elective surgeries, evaluating insertion conditions and haemodynamic stability between the two groups. There were no significant differences observed in demographic, clinical, or surgical parameters between groups. Similarly, Choudhary et al. found that both groups were comparable in baseline characteristics: mean age 39.2 ± 12.0 (PD) vs 41.0 ± 11.7 (PF, $p = 0.519$), weight 66.9 ± 13.0 vs 66.9 ± 9.8 kg ($p = 1.000$), gender ($p = 0.642$), and ASA I/II ($p = 0.469$).^[8] This shows that Dp offers smoother insertion and better haemodynamic control; thus, it may be preferred for PLMA insertion in elective surgeries.

In our study, Group Dp showed better jaw relaxation, smoother insertion, higher first-attempt success, and fewer minor complications compared to Group Fp, with no major adverse events observed. Similarly, Ramaswamy and Shaikh found that jaw relaxation was complete in all patients of Group Dp and 97.5% of Group Fp ($p = 0.250$). Absence of coughing occurred in 92.5% and 90%, respectively ($p = 0.12$). Spontaneous ventilation was higher in Group Dp (65%) than in Group Fp (42.5%) ($p = 0.008$). Apnoea duration averaged 227 s vs 290 s.^[11] Choudhary et al. show that optimal jaw relaxation was achieved in 91.9% of the dexmedetomidine–propofol group and 83.8% of the fentanyl–propofol group ($p > 0.05$). Coughing was less frequent with dexmedetomidine ($p < 0.05$). Hemodynamics were more stable, while apnea lasted longer with fentanyl ($p = 0.011$).^[8] Therefore, Dp offers smoother insertion and stable

hemodynamics, making it preferable for PLMA insertion.

Our study shows that heart rates were initially similar between groups, but Group Dp showed a sustained and significant reduction in heart rate after drug administration. Similarly, Suja et al. found that baseline heart rate was similar between groups (F: 80.93 ± 3.98 ; D: 81.37 ± 4.12). After insertion, heart rate remained higher in Group Fp, while Group Dp showed a steady decline to 74.40 ± 4.08 at 10 minutes, indicating better stability.^[12] In this case, Dp ensures better heart rate control and stability.

In this study, ephedrine use was slightly higher in Group Dp without a significant difference, while atropine was administered only in Group Dp. Similarly, Park et al. in 116 patients receiving spinal anaesthesia with dexmedetomidine, those pre-treated with ephedrine required less rescue ephedrine (1.04 ± 2.89 mg vs 2.03 ± 3.25 mg; $p = 0.007$) and atropine (0.09 ± 0.21 mg vs 0.28 ± 0.41 mg; $p = 0.001$).^[13] Fujii et al. in a study of 108 patients, heart rate was consistently lower in the dexmedetomidine group ($n=69$) compared to the control group ($n=14$) at all time points ($p < 0.025$). In contrast, the propofol group ($n=25$) showed a significant decrease only 60 minutes after atropine administration ($p=0.002$).^[14] Thus, Dp may cause bradycardia, requiring cautious monitoring.

In the present study, both groups had comparable baseline systolic and diastolic pressures. Group Dp showed lower diastolic values, higher oxygen saturation, and consistently higher respiratory rates, indicating better haemodynamic and respiratory stability after drug administration. Similarly, Muthachen et al. found that baseline systolic blood pressure values were comparable between the two groups ($p = 0.713$). Following LMA insertion, Group Dp demonstrated significantly lower SBP from 1 to 40 minutes ($p \leq 0.005$). However, no significant differences were observed at 50 and 60 minutes ($p = 0.304$ and $p = 0.051$).^[15]

Similarly, Nellore et al. diastolic blood pressure decreased in both groups but remained significantly higher with dexmedetomidine–propofol (70.4 ± 5.2 mmHg) than fentanyl–propofol (63.3 ± 4.9 mmHg) after LMA insertion ($p < 0.001$).^[16] Yuan et al. in the study comparing dexmedetomidine fentanyl (DF) and propofol fentanyl (PF) groups ($n=50$ each), the mean SpO₂ was significantly higher in the DF group ($99.3 \pm 0.5\%$) than in the PF group ($98.6 \pm 0.8\%$; $p < 0.01$). Hypoxemia occurred in 1 patient (2%) in the DF group vs 7 patients (14%) in the PF group ($p < 0.05$).^[17]

Similarly, Muthachen et al. in a randomised study, baseline respiratory rates were similar between the groups (Group Dp: 17.8 ± 3.66 vs Group Fp: 16.7 ± 4.09 ; $p = 0.376$). However, after insertion, Group Dp maintained significantly higher respiratory rates at 1 to 20 minutes ($p < 0.05$).^[15] In this way, Dp maintains stable blood pressure, higher oxygen saturation, and steady respiratory rates, ensuring superior

haemodynamic and respiratory stability during PLMA insertion.

Limitations

This single-centre study with a small sample size and limited to ASA I patients lacks invasive haemodynamic monitoring and drug level measurement, restricting generalisability and comprehensive assessment of dexmedetomidine and fentanyl's pharmacodynamic effects.

CONCLUSION

Dexmedetomidine propofol was a better co-induction option for elective surgeries than Fp because it allows smoother PLMA insertion, enhances hemodynamic and respiratory stability, and causes fewer complications. It improves patient safety and procedural efficiency by maintaining stable cardiovascular parameters and adequate ventilation.

REFERENCES

1. Chidipothu K, Choudhary (Verma) N. Comparison of I-gel and Laryngeal Mask Airway Proseal for clinical performance in short surgical procedures under general anaesthesia: A study protocol. *J Pharm Res Int* 2021;33(62A):65–71. <https://journaljpri.com/index.php/JPRI/article/view/5308>.
2. Parsa T, Dabir S, Radpay B. Ventilation with ProSeal Laryngeal Mask Airway during short-term elective gynecologic surgery. *Tanaffos* 2006;5(3):19–23. https://applications.emro.who.int/imemrf/Tanaffos_2006_5_3_19_23.pdf?
3. Dutt A, Joad AK, Sharma M. Induction for classic laryngeal mask airway insertion: Does low-dose fentanyl work? *J Anaesthesiol Clin Pharmacol* 2012;28:210–3. <https://doi.org/10.4103/0970-9185.94877>.
4. Paneerselvam S, Nandakumar M. A randomised controlled trial on comparison of sevoflurane induction to propofol induction for insertion of laryngeal mask airway in adults. *Indian J. Clin. Anaesth* 2016;3(4): 616–620 <https://doi.org/10.18231/2394-4994.2016.0025>.
5. Venugopal K, Murthy VK, Pavankumar P. Comparison of haemodynamic responses to insertion of Classic LMA and endotracheal tube: A randomised controlled study in adult patients posted for elective surgery under general anaesthesia. *J Cardiovasc. Dis. Res.* 2021;12:2284–91. <https://doi.org/10.48047/>.
6. Ubeja D, Ravishankar RB. A comparative study of small doses of ketamine and midazolam as co-induction agents to propofol in patients undergoing elective surgeries under general anaesthesia. *J Evid Based Med Healthc* 2020;7(44):2557–2561. <https://doi.org/10.18410/jebmh/2020/528>.
7. Prathapadas U, Gomathamma M, Arulvelan A, Lionel KR, Hrishi AP. A study comparing propofol auto-coinduction and standard propofol induction in patients undergoing general anaesthesia without midazolam pretreatment: A prospective randomised control trial. *Anesth Essays Res* 2018;12:690–4. https://doi.org/10.4103/aer.AER_102_18.
8. Choudhary A, Singh S, Singh S, Alam F, Kumar H. Bispectral index-guided comparison of dexmedetomidine and fentanyl as an adjuvant with propofol to achieve an adequate depth for endotracheal intubation - A double-blind randomised controlled trial. *Indian J Anaesth* 2024;68:334–9. https://doi.org/10.4103/ija.ija_884_23.
9. Muthachen NR. A comparison of dexmedetomidine-propofol and fentanyl-propofol for laryngeal mask airway insertion: A randomised double-blind study. *Cureus* 2025;17:e91713. <https://doi.org/10.7759/cureus.91713>.
10. Weerink MAS, Struys MMRF, Hannivoort LN, Barends CRM, Absalom AR, Colin P. Clinical pharmacokinetics and pharmacodynamics of dexmedetomidine. *Clin Pharmacokinet* 2017;56:893–913. <https://doi.org/10.1007/s40262-017-0507-7>.
11. Ramaswamy AH, Shaikh SI. Comparison of dexmedetomidine-propofol versus fentanyl-propofol for insertion of the laryngeal mask airway. *J Anaesthesiol Clin Pharmacol* 2015;31:217–20. <https://doi.org/10.4103/0970-9185.155152>.
12. Suja KC, Sethunath R, Joseph E, Cheeram ST. Comparative evaluation of the effects of dexmedetomidine-propofol and fentanyl-propofol on various parameters during I-gel insertion. *Asian J Pharm Clin Res* 2023;16:134–138. <http://dx.doi.org/10.22159/ajpcr.2023v16i8.47757>.
13. Park J-H, Shim J-K, Hong H, Lim HK. The efficacy of intramuscular ephedrine in preventing hemodynamic perturbations in patients with spinal anaesthesia and dexmedetomidine sedation. *Int J Med Sci* 2020;17:2285–91. <https://doi.org/10.7150/ijms.48772>.
14. Fujii E, Tanaka-Mizuno S, Fujino K, Fujii M, Furuno M, Sugimoto Y, et al. Dexmedetomidine attenuates the positive chronotropic effects of intravenous atropine in patients with bradycardia during spinal anaesthesia: a retrospective study. *JA Clin Rep* 2018;4:70. <https://doi.org/10.1186/s40981-018-0207-9>.
15. Muthachen NR. A comparison of dexmedetomidine-propofol and fentanyl-propofol for laryngeal mask airway insertion: A randomised double-blind study. *Cureus* 2025;17:e91713. <https://doi.org/10.7759/cureus.91713>.
16. Nellore SS, Waychal AD, Rustagi PS. Comparison of dexmedetomidine-propofol versus fentanyl-propofol on insertion conditions of Proseal laryngeal mask airway. *J Clin Diagn Res* 2016;10(11):UC06–9. <https://doi.org/10.7860/JCDR/2016/23244.8934>.
17. Yuan F, Fu H, Yang P, Sun K, Wu S, Lv M, et al. Dexmedetomidine-fentanyl versus propofol-fentanyl in flexible bronchoscopy: A randomised study. *Exp Ther Med* 2016;12:506–12. <https://doi.org/10.3892/etm.2016.3274>.