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Original Research Article

Comparative Evaluation of Dexmedetomidine Infusion with Midazolam versus Midazolam for Awake Fiberoptic Nasal Intubation: A Randomized Prospective Study

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Abstract:

Background: Awake fiberoptic intubation (AFOI) is a favoured method of handling difficult airways, necessitating the best sedation for patient comfort with the preservation of spontaneous ventilation. Dexmedetomidine is a drug that causes sedation with less respiratory depression and can be an alternative to midazolam.

Objective: To compare the efficacy of dexmedetomidine with midazolam versus midazolam alone for AFOI in intubation ease, patient comfort, hemodynamic stability, and complications.

Materials and Methods: A double-blind, randomized trial was performed on 60 ASA I–II adult patients who were undergoing elective surgery under general anaesthesia (GA). The patients were divided into two groups: Group M received midazolam 0.05 mg/kg IV, and Group DM received dexmedetomidine 1 µg/kg IV over 10 minutes, followed by midazolam 0.025 mg/kg IV. All the patients were given 4% lidocaine nebulization and airway blocks prior to intubation. The main outcomes measured were the onset of sedation, intubation time, ease of intubation, comfort of the patient, hemodynamic variables, and complications. GA was induced with propofol, fentanyl, and rocuronium after successful AFOI. Statistical analysis was done using SPSS, and $p<0.05$ was taken as significant.

Results: Group DM showed a much more rapid onset of sedation (2.78 ± 0.99 min vs 4.10 ± 1.42 min, $p<0.001$), improved hemodynamic stability, and less additional anaesthetic required (6.67% vs 30%, $p<0.05$). Intubation was ranked as easy in 90% of Group DM patients versus 60% of Group M patients ($p=0.015$). Patient comfort scores were greater in Group DM ($p<0.0001$), and fewer adverse events were reported.

Conclusion: The combination of dexmedetomidine and midazolam improves the quality of sedation, makes AFOI smoother, and increases patient comfort while providing stable hemodynamics. The combination seems to be a better option for managing difficult airways than using midazolam alone.

Keywords: Awake fiberoptic intubation, Dexmedetomidine, Midazolam, Intubation efficiency, Patient comfort, Hemodynamic stability.

Introduction

All airways are 'intubatable,' but the question is, how? This is the prime concern of clinicians when they deal with a patient's airway. Airway management and intubation remain central issues of concern for anesthesiologists globally. However, the possibility of dealing with a challenging airway sends even veteran anesthesiologists into a panic mode. Difficulties in intubating difficult airway patients can be as simple as being unable to ventilate, unable to intubate, or experiencing both. A difficult airway algorithm strongly promotes the creation of a strategy—Plan A, Plan B, Plan C—prior to attempting intubation. Difficult airways result from a multifactorial interplay among patient-specific factors, the clinical setting, and the anaesthesiologist's skills [1,2].

Awake fiberoptic intubation (AFOI) is an essential procedure in the care of a known difficult airway

patient. AFOI makes a gentle oral or nasal flexible approach possible under good vision to see the vocal cords clearly, and it places an endotracheal tube inside the trachea through direct visualization. AFOI differs from general anesthetic-facilitated fiberoptic intubation since AFOI leaves the patient conscious. Even if patients are sedated during AFOI, they should remain responsive and competent to sustain their airways themselves. Though a critical intervention, AFOI is underutilized because it is not familiar. The best conditions for AFOI involve a comfortable, cooperative patient without oropharyngeal secretions or blood and with spontaneous ventilation capability. These conditions are achieved by utilizing a short-acting, titratable pharmacologic agent with adequate sedation but not compromising spontaneous ventilation. A typical combination for sedation in AFOI has been midazolam and fentanyl, but this combination carries the risk of hypoxemia and aspiration [3,4].

Dexmedetomidine, an α2 agonist, has the benefits of less salivary secretions, lower sympathetic activity, sedation without causing respiratory depression, and analgesia. These factors make it a preferred option to increase the clinical environment during AFOI, both in performance and quality. Dexmedetomidine has also become a recent favourite as a substitute for the use of classic opioid combinations in AFOI procedures [5].

The main aim of this research was to evaluate the performance and quality of AFOI with the supplementation of a prophylactic dexmedetomidine infusion to midazolam against sedation using midazolam alone. The study measured aspects such as intubation efficiency, patient comfort, hemodynamic stability, and complications. Other measures were intubation time, number of attempts, and ease of intubation. Patient comfort and post-procedure satisfaction were measured, in addition to the subjective evaluation of the performer regarding ease of performing AFOI. Hemodynamic alterations, such as heart rate, blood pressure, and oxygen saturation, were followed during the procedure. The investigation also assessed and compared the complications experienced by both groups upon AFOI.

Materials and Methods

The randomized prospective, double-blind study was carried out in the Department of Anaesthesiology after attaining permission from the institutional ethical committee. Informed consent was obtained from all patients entering the study. A total of 60 adult patients of either sex, aged over 18 years and classified as ASA I or II, who were scheduled to undergo elective surgical procedures under general anaesthesia, were enrolled. These patients were randomly divided into two groups. Group M (Midazolam group) received only Inj. Midazolam as a sedative agent for awake fiberoptic bronchoscopy-assisted intubation, while Group DM (Dexmedetomidine & Midazolam group) received both Inj. Dexmedetomidine and Inj. Midazolam. The present study was conducted using the double-blinded technique, so both the personnel who performed the procedure and those assessing the results were unaware of which drug was used. An independent person carried out the randomization and administration of drugs, and patients were also blinded to the treatment they received. The sample size in the study was determined using a power analysis, which took into consideration data from the previous studies, ensuring that the group would have good power to detect meaningful differences between the groups.

Patients aged 18 years or more with an ASA status I or II were included in this study. Additional inclusion criteria were male and non-lactating female patients, where female patients were either not of childbearing potential or were using acceptable birth control methods. Patients requiring awake fiberoptic intubation due to anticipated difficult airways, such as a history of difficult intubation, prominent protruding teeth, small mouth opening, or other related conditions, were included. Patients who gave voluntary written informed consent were considered for inclusion. Exclusion criteria included those who had had experimental drug use within 30 days prior to the study, who suffered from central nervous system diseases, uncontrolled seizure disorders, alcohol intoxication at the time of investigation, or cardiovascular problems such as recent myocardial infarction, abnormal heart rhythms, or uncontrolled hypertension. Other exclusion factors included severe liver dysfunction, allergy or contraindications to study drugs, and conditions that could compromise patient safety.

Detailed preoperative evaluations were conducted, including history taking, physical examinations, and necessary investigations. Patients were classified according to ASA status and had their airways assessed using the Mallampati classification. Those who satisfied the criteria for the study were selected before surgery and received oral antacid prophylaxis. Standard fasting also preceded surgery to ensure maximum patient safety in handling. The sample size was calculated using standard statistical techniques, thus providing sufficient power for the study to detect any significant differences. With results from the analysis of Gupta et al., the formula for sample size computation was applied by using the propofol requirement in both groups [6]. Based on this, the sample size was calculated to be 30 patients per group, which meant 60 participants in total. Statistical power and significance levels were set at 90% and 0.001, respectively.

Baseline hemodynamic parameters, including heart rate, systolic blood pressure, diastolic blood pressure, and mean arterial pressure, were noted upon entry into the operating room. All patients received intravenous injections of Ondansetron and Glycopyrrolate as part of the preoperative regimen. Nasal decongestion was achieved through the administration of xylometazoline drops and lignocaine-soaked gauze, which were applied to the nostrils for 10 minutes. The oral mucosa was anaesthetized with 10% lignocaine, and local anaesthesia was given to the superior and recurrent laryngeal nerves. Patients in Group M received midazolam (0.02 mg/kg) intravenously, while patients in Group DM received both dexmedetomidine (1 µg/kg) and midazolam. Dexmedetomidine was given as a bolus over 15 minutes, followed by a continuous infusion to maintain sedation. Midazolam was administered in the same dose as Group M. The hemodynamic parameters were repeated after drug administration to assess the effects of sedation.

Fiberoptic bronchoscopy was done by passing the bronchoscope through the predetermined nostril while keeping the patient in the "sniffing of morning air" position. The bronchoscope was advanced up to the visibility of the vocal cords. In case of any coughing or discomfort, lignocaine could be given to the patient to alleviate the problem. Once the bronchoscope was passed through the vocal cords and the trachea and carina were identified, an endotracheal tube was passed under direct fiberoptic guidance. Tube placement was confirmed by auscultation and capnography. If supplementation of anaesthesia was needed, either propofol was given.

The study outcomes of hemodynamic stability were measured based on the patient's comfort during the procedure, the ease of intubation, and any complications such as bronchospasm, laryngospasm, or desaturation. Additional anaesthesia requirements and the patient's satisfaction with the procedure were also gathered. This latter was evaluated with the help of the Visual Analogue Scale (VAS). All data were statistically analyzed using SPSS, and results are presented as means ± standard deviations for continuous variables and numbers or percentages for categorical data. The outcomes between the groups were compared using appropriate statistical tests, such as the student's unpaired t-test for continuous variables and the chi-square test for categorical data. A p-value of <0.05 was considered statistically significant.

Results

This study included 60 healthy adult patients who were planned for elective surgeries requiring general anaesthesia and endotracheal intubation with an anticipated difficult airway. The participants were randomly divided into two groups, Group M, which received Inj. Midazolam and Group DM were administered in Inj. Dexmedetomidine, in addition to Inj. Midazolam. Both groups received airway blocks with local anaesthetics. The baseline characteristics of the two groups, which included age, gender, body mass index (BMI), Mallampatti classification (MPC), and American Society of Anaesthesiologist's (ASA) physical status, were comparable, hence ensuring that the groups were well-matched for comparison, as seen in Table 1.

Table 1: Demographic Characteristics

S. No.	Variable	Group M	Group DM	P-value
1	Age (years)	47.96 ± 17.01	47.83 ± 15.13	0.974
2	BMI	21.68 ± 3.33	20.55 ± 2.51	0.144
3	Gender (M:F)	26:4 (86.67%:13.33%)	24:6 (80%:20%)	0.73
4	MPC III/IV	12:18	16:14	0.444
5	ASA I/II	21:9	24:6	0.371

The onset time, from when the drug is given to reaching appropriate sedation to manage airway, was considerably shorter for Group DM than it was in Group M. This was from a mean value of 2.78 ± 0.99 minutes to achieve adequate sedation in patients assigned to receive midazolam with dexmedetomidine, to 4.10 ± 1.42 minutes in Group M. Dexmedetomidine added to midazolam, as suggested by the outcome, achieved rapid onset to midazolam alone as seen in Table 2.

Table 2: Onset Time in minutes

S. No.	Variable	Group M (mean ± SD)	Group DM (mean ± SD)	P-value
1	Onset time (minutes)	4.10 ± 1.42	2.78 ± 0.99	<0.001

Heart rate (HR) and blood pressure were recorded at each stage of the procedure, as seen in Table 3. Both groups were equal in baseline heart rates and blood pressures. However, during the study, Group DM exhibited a more significant reduction in both heart rate and blood pressure compared to Group M. The heart rate in Group M decreased from 85.72 ± 4.76 beats per minute to 78.33 ± 3.12 beats per minute, while in Group DM, it decreased from 85.42 ± 5.08 beats per minute to 71.95 ± 3.94 beats per minute.

Similarly, systolic and diastolic blood pressures (SBP and DBP) were more markedly reduced in Group DM. Group M's SBP decreased from 129.17 ± 7.32 mmHg to 124.56 ± 6.89 mmHg, while the SBP of Group DM decreased from 128.64 ± 7.01 mmHg to 116.23 ± 7.44 mmHg. Group M had a DBP that reduced from 79.42 ± 6.21 mmHg to 77.05 ± 5.09 mmHg, while Group DM had the most significant reduction, from 79.17 ± 5.67 mmHg to 68.68 ± 5.25 mmHg. It means that dexmedetomidine affects heart rate and blood pressure significantly, an effect that would be helpful in airway management.

Table 3: Comparison of vital parameters between the two groups

S. No.	Variable	Group M (mean ± SD)	Group DM (mean ± SD)	P-value
1	Heart rate (before drug administration)	85.72 ± 4.76	85.42 ± 5.08	0.927
2	Heart rate (after drug administration)	78.33 ± 3.12	71.95 ± 3.94	<0.001
3	Systolic BP (before drug administration)	129.17 ± 7.32	128.64 ± 7.01	0.864
4	Systolic BP (after drug administration)	124.56 ± 6.89	116.23 ± 7.44	<0.001
5	Diastolic BP (before drug administration)	79.42 ± 6.21	79.17 ± 5.67	0.911
6	Diastolic BP (after drug administration)	77.05 ± 5.09	68.68 ± 5.25	<0.001

The average time required for intubation, as seen in Table 4, was only marginally smaller in Group DM than in Group M. That is 368 ± 188.24 seconds for the former and 396 ± 186.83 seconds for the latter. Nevertheless, this did not achieve a significant difference in value since p = 0.56 was higher than 0.05. This shows that though it reduces the average time to effect intubation with the administration of dexmedetomidine and midazolam combined, the amount of reduction cannot be statistically significant.

Table 4: Total time required for intubation

S. No.	Variable	Group M (mean ± SD)	Group DM (mean ± SD)	P-value
1	Total time required for intubation	396 ± 186.83 seconds	368 ± 188.24 seconds	0.56

The table depicts that 30% of the patients in Group M, or 9 out of 30, needed supplemental anaesthetic drugs during the procedure, whereas 6.67% of patients in Group DM, or 2 out of 30, needed supplementation, as seen in Table 5. This difference is statistically significant between the two groups, with a p-value less than 0.05. This means that the addition of dexmedetomidine to midazolam reduces the requirement for supplemental anaesthetic drugs during intubation.

Table 5: Requirement of additional anaesthetic drugs

S. No.	Variable	Group M (n = 30)	Group DM (n = 30)	P-value
1	Requirement of additional anaesthetic drugs	9 (30%)	2 (6.67%)	< 0.05

Table 6 shows the grades of ease of intubation given by the performer after performing the procedure with a fiberoptic bronchoscope. In Group M, 18 out of 30 patients were intubated quickly; in Group DM, 27 out of 30 patients were swiftly intubated. In Group M, 11 patients were graded as having moderate difficulty in comparison with the three similar patients out of 30 that were found in Group DM. One patient had difficulty being intubated within Group M, and no such situation was seen with Group DM patients. The results indicate that the addition of dexmedetomidine to midazolam in performing airway fiberoptic intubation (Group DM) was significantly more straightforward than that of midazolam alone (Group M). The difference was statistically significant with a p-value of 0.015, which indicated that the addition of dexmedetomidine improves the ease of intubation.

Table 6: Ease of intubation

S. No.	Ease of Intubation	Group M (n = 30)	Group DM (n = 30)	P-value
1	Grade 1 (Easy)	18	27	0.015
2	Grade 2 (Moderate)	11	3	
3	Grade 3 (Difficult)	1	0	

Ambuel's Total Comfort Score in the fiberoptic bronchoscope insertion and the endotracheal tube insertion both showed highly significant differences between the two groups, Group M and Group DM. Group M had higher levels of discomfort, with a large proportion of them having comfort score ranges between 17-24, indicating moderate to high levels of discomfort in fiberoptic bronchoscope insertion. Specifically, 15 patients in Group M were within the score range of 17-20, and 5 patients scored in the 21-24 range. Comparatively, there were no patients in the higher discomfort ranges for Group DM [17-24]. Most patients in Group DM scored in the comfort range of 9-16, significantly lower than any score in discomfort. The statistical analysis showed a very significant difference of P = 0.000 between the two groups, signifying that the patients who were given both midazolam and dexmedetomidine were significantly comfortable during the insertion procedure of fiberoptic bronchoscope. Again, during the endotracheal tube insertion process, Group DM also showed an excellent comfort score as compared with Group M. In Group M, 14 patients had comfort scores that were in the range of 21-24, which depicted moderate discomfort; 9 had scores in the range of 25-28, which reflects even higher degrees of discomfort. On the other hand, in Group DM, fewer patients reported high discomfort. Only one patient had a score in the 21-24 range. Moreover, a significantly greater number of patients who had lower comfort scores [9-16] were seen in Group DM. This indicates that they experienced less discomfort overall. For example, 15 patients in Group DM had comfort scores in the 13-16 range. According to statistical analysis again, the gap between the two sets was significantly more significant at 0.000 P. To summarize, comfort levels were substantially higher for endotracheal tube and fiberoptic bronchoscope placement procedures for subjects in Group DM who were taken on combination drug dexmedetomidine midazolam as against controls in Group M who received solely midazolam. The addition of dexmedetomidine to midazolam resulted in a marked improvement in patient comfort, making this combination a more practical approach for minimizing discomfort during these procedures. This is shown in Table 7.

Table 7: Showing the Ambuel's Total Comfort Score in Both Groups During Fiberoptic Bronchoscope and Endotracheal Tube Insertions

Total Comfort Score	Group M Fiberoptic Bronchoscope	Group DM Fiberoptic Bronchoscope	P-value	Group M Endotracheal Tube Insertion	Group DM Endotracheal Tube Insertion	P-value
05-08	0	0	<0.0001	0	0	<0.0001
09-12	2	17		0	3	
13-16	8	13		1	15	
17-20	15	0		4	11	
21-24	5	0		14	1	
25-28	0	0		9	0	
29-32	0	0		1	0	
33-35	0	0		0	0	

The complications that arose during the process of fiberoptic bronchoscope intubation were notably different between Group M and Group DM. In the treatment group M, 7 out of 30 patients reported a decrease in SpO2 below 95%, whereas in the placebo group DM, only 2 out of 30 patients showed such a drop. This difference has been statically significant with a P-value of 0.010, which would demonstrate that the use of dexmedetomidine with midazolam proved to prevent hypoxia during intubation in more patients. In terms of coughing during intubation, 14 out of 30 patients in Group M developed coughing, while only 3 out of 30 patients in Group DM experienced this complication. This difference was also statistically significant (P-value of 0.002), suggesting that dexmedetomidine in combination with midazolam may reduce the occurrence of coughing during the procedure. There were no laryngospasm and bronchospasm complications seen in the groups, so the two regimens were adequate for preventing the above severe complications occurring during intubation through fiberoptic bronchoscope. In conclusion, Group DM had fewer complications; SpO2 drops and coughing showed statistical significance over Group M. It establishes the added beneficial role of dexmedetomidine in association with midazolam during intubation procedures, as seen in Table 8.

Table 8: Complications in both groups

S. No.	Variable	Group M	Group DM	P-value
1	No. of patients whose SpO2 < 95%	7	2	0.01
2	No. of patients who had developed coughing	14	3	0.002
3	No. of patients who had developed laryngospasm	0	0	-
4	No. of patients who had developed bronchospasm	0	0	-

Discussion

AFOI remains the gold standard for managing anticipated difficult airways, where the patient's anatomy, physiology, or medical condition makes conventional intubation techniques challenging or unsafe. However, AFOI can be associated with significant discomfort and requires not only the clinician's skill but also the patient's cooperation. The procedure requires the patient to stay awake and responsive throughout the intubation process to ensure airway protection and prevent aspiration. To achieve this, adequate airway blockade of the recurrent laryngeal, superior laryngeal, and glossopharyngeal nerves is necessary. Yet, for optimal performance, additional sedation, analgesia, and amnesia are crucial to reduce pain and anxiety, thereby improving patient cooperation. Despite using a range of sedative agents, including fentanyl, remifentanil, ketamine, propofol, and midazolam, respiratory depression remains a significant concern. These sedatives can impair respiratory drive, leading to hypoventilation, hypercarbia, and hypoxia, which may compromise the success of the AFOI procedure. Hence, there is a demand for an ideal sedative agent that can provide adequate sedation, analgesia, and amnesia without causing significant respiratory depression or desaturation while still maintaining cardiovascular stability throughout the procedure [6–8].

Dexmedetomidine, an α2-adrenoreceptor agonist, has emerged as a promising agent for this purpose. Unlike other sedatives, dexmedetomidine is highly selective compared to its predecessor, clonidine, and has a unique ability to sedate patients without significantly impairing their respiratory drive. It allows patients to remain sedated yet awake with spontaneous respiration, making it particularly useful in procedures such as AFOI [9,10]. Dexmedetomidine has significant analgesic properties, which is beneficial in reducing the discomfort associated with airway manipulation. Its ability to allow neurologic assessments post-intubation also enhances its appeal. Several previous studies, including those by Bergese et al., Venn et al., and Hatfield et al., have noted dexmedetomidine's minimal effect on respiratory function, as well as its ability to blunt the hemodynamic response to intubation, which further supports its use in complex airway management [11–13].

Both groups were comparable in terms of age, BMI, sex ratio, and ASA grade. No significant differences were found between the groups at baseline regarding these demographic factors, ensuring the study's fairness and reliability. These are in accordance with the studies of Demiraran et al. and Gao et al. [14,15]. After premedication with either midazolam alone or a combination of dexmedetomidine and midazolam, the groups underwent the AFOI procedure. The study found that the mean intubation time in the dexmedetomidine group was slightly lower (368 seconds) compared to the midazolam group, which took an average of 396 seconds. While the difference was not statistically significant, dexmedetomidine may lead to a slightly more efficient procedure. These are similar to the study done by Bano et al. [16]. Fewer patients in Group DM required supplementary anaesthetic agents, indicating that dexmedetomidine combined with midazolam was compelling enough on its own to maintain patient comfort during the procedure. The first-attempt intubation success rates were identical in both groups, and no failed attempts were noted. However, the ease of intubation was significantly higher in the DM group, with 90% of patients being intubated easily compared to only 60% in the M group. These results are similar to the study by Wang et al. [17].

Patient reactions during the procedure also differed between the two groups. Patients in Group DM exhibited milder reactions to the procedure, with significantly fewer severe grimaces during endotracheal tube insertion (3.3% in Group DM vs 20% in Group M). These are in accordance with the study by Tsai et al. [18]. Comfort scores were also significantly higher in the DM group during both the fiberoptic insertion (12 vs. 17.4) and tube insertion (15.8 vs. 23.6), highlighting the superior patient comfort with dexmedetomidine. These findings align with those of Gupta et al., who also found that dexmedetomidine improves patient comfort compared to other sedatives during AFOI [6]. Additionally, patients in the DM group reported higher satisfaction, as reflected in their VAS (8.66 vs. 5.86 in Group M), a statistically significant difference. These findings corroborate the results of other studies that have demonstrated that dexmedetomidine offers superior patient satisfaction during AFOI compared to midazolam alone. The enhanced comfort and satisfaction could likely be attributed to the lower discomfort levels during airway manipulation and better sedation

without compromising respiratory function [6,17,18].

In terms of hemodynamic stability, the study found no significant differences in HR, SBP, or DBP between the two groups before the onset of premedication, which aligns with baseline readings. Following the administration of premedication, both groups exhibited statistically comparable HR, SBP, DBP, and MAP values, suggesting that neither dexmedetomidine nor midazolam had a pronounced effect on hemodynamics in the pre-intubation phase. This is consistent with findings by Bergese et al. and Tsai et al., who also observed no significant changes in hemodynamics after the administration of these drugs. Post-intubation, there was a marked difference between the two groups in terms of HR, SBP, and MAP responses. In Group M, the mean HR increased significantly to 92.93 ± 6.67 beats per minute, whereas in Group DM, the mean HR decreased to 71.23 ± 6.16 beats per minute ($p = 0.000$). This data indicates that the dexmedetomidine group experienced a more controlled stress response to intubation, with a decrease in HR from baseline, which is consistent with previous studies by Bergese et al. and Tsai et al. [11,18]. These studies also observed a blunted increase in HR during intubation in the dexmedetomidine group compared to other sedatives. Similarly, the SBP response to intubation was significantly different between the two groups. Group M exhibited a rise in SBP by 14 mm Hg, while Group DM showed a decrease of 13 mm Hg from baseline ($p = 0.000$). These findings suggest that dexmedetomidine more effectively blunted the stress response to intubation, which is in line with the results reported by Bergese et al., who also noted a reduction in SBP with dexmedetomidine [11]. This difference in blood pressure response can be attributed to the sympatholytic effects of dexmedetomidine, which may reduce the sympathetic response to the stress of intubation. For MAP, Group DM also exhibited a significant decrease (10 mm Hg) compared to Group M, which showed a rise of 14 mm Hg ($p < 0.05$). These hemodynamic changes suggest that dexmedetomidine provides better cardiovascular stability during the procedure, which is particularly important in high-risk patients [13,18].

Regarding complications, the study found that the incidence of desaturation ($SpO2 < 95\%$) was significantly lower in the DM group (7%) compared to the M group (23%). This finding aligns with previous research by Cattano et al. and Tsai et al., who reported lower rates of desaturation with dexmedetomidine compared to other agents like remifentanil or propofol. The reduced incidence of desaturation in the DM group can likely be attributed to shorter procedure times, better patient tolerance, and fewer episodes of breath-holding.

Coughing, another common complication during AFOI, was significantly less frequent in Group DM (10%) compared to Group M (47%), which may be due to better patient comfort and reduced discomfort during the intubation process. This result is consistent with the findings of Gupta et al., who noted fewer coughing incidents in patients receiving dexmedetomidine compared to those receiving other sedatives [6]. Although no statistically significant differences were found in this study, the trend toward fewer coughing incidents in the DM group further supports the idea that dexmedetomidine improves patient tolerance during AFOI. No cases of laryngospasm or bronchospasm were observed in either group, suggesting that both sedative regimens provided effective airway management without leading to significant airway complications.

Conclusion

This study contrasted the administration of dexmedetomidine with midazolam against the use of midazolam alone for AFOI in patients with predicted difficult airways. The combination of dexmedetomidine and midazolam resulted in quicker intubation, greater patient comfort, and reduced requirements for supplemental anaesthetics. Patients were less anxious, had fewer reactions, and received better satisfaction scores compared to patients receiving midazolam alone. The rates of successful intubation were comparable between groups. Still, hemodynamic stability was improved in the dexmedetomidine group with reduced sympathetic response to intubation, as well as reduced desaturation and coughing episodes. Overall, the combination of dexmedetomidine and midazolam improved AFOI quality with good hemodynamic results and reduced side effects, and is a good choice for the management of difficult airways unless contraindicated.

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