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A Comparative Study of Haemodynamic Response during Endotracheal Intubation between Injection Dexmedetomidine versus Combination of Paracetamol+Tramadol+ Lignocaine+ Magnesium Sulphate in Patients Undergoing Abdominal Laparoscopic Surgeries

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Abstract: Background: Direct laryngoscopy and tracheal intubation frequently provoke sympathetic surge that can destabilize cardiovascular parameters. Several pharmacologic agents are used to blunt this stress response and improve perioperative analgesia. Dexmedetomidine, a selective α_2-agonist, provides predictable hemodynamic control as well as analgesia, whereas a practical multimodal mixture containing paracetamol, tramadol, lignocaine, and magnesium sulfate ("Shivmix") is often employed in resource-limited environments. This research assessed comparative effectiveness of dexmedetomidine and this multimodal combination in patients undergoing elective laparoscopic abdominal procedures. **Methods:** In total, 120 adults between ages of 18-50, who have been scheduled for an elective laparoscopic cholecystectomy and classified as ASA I–II were divided into 2 groups of 60 each for this prospective, randomized, double-blind research. Group B received an infusion of paracetamol 20mg/kg, tramadol 2mg/kg, lignocaine 1.5mg/kg, and magnesium sulfate 40mg/kg in 100 mL saline for the same duration as Group A, which received intravenous dexmedetomidine 1µg/kg over ten minutes. Infusions were both finished 15 minutes before laryngoscopy. All patients had the same anesthetic technique. Hemodynamic variables were monitored at preset intervals, and pain has been assessed by using the VAS scale for 24 hours post-surgery. **Results:** Groups' baseline characteristics were similar. There was no difference between the groups, and neither regimen caused an increase in HR during intubation. Systolic and diastolic blood pressure increases during and after intubation were more effectively prevented by dexmedetomidine ($P<0.05$). In contrast, the combination of multimodal was consistently associated with lower postoperative VAS scores at the majority of time points and significantly lower rates of rescue analgesia (30% vs 63%, $P<0.05$). Dexmedetomidine group experienced transient bradycardia only. Other adverse effects have been comparable and minimal. **Conclusion:** Dexmedetomidine has been more effective in suppressing the pressor response to intubation, and multimodal infusion "Shivmix" was more effective and maintained postoperative analgesia. The multimodal approach is a viable alternative when access to opioids and/or dexmedetomidine is limited. Selection of therapy may thus be influenced by the clinical need for immediate haemodynamic control or for long-term analgesia.

Keywords: Magnesium sulphate, hemodynamic response, tramadol, lignocaine, dexmedetomidine, tracheal intubation, paracetamol.

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INTRODUCTION

Laryngoscopy and tracheal intubation are known to cause brief but significant sympathetic activation, which may result in tachycardia and hypertension [1]. When pneumoperitoneum is created, and during the change of position during laparoscopic procedures, this stress response is further determined by cardiovascular dynamics and frequently amplified [2]. Many surgical patients will suffer from significant postoperative pain without proper analgesics, potentially prolonging recovery and increasing the risk of chronic pain syndromes [3]. Furthermore, after laparoscopy, frequent postoperative nausea and vomiting, and shoulder pains from diaphragmatic irritation are observed [4]. Therefore, perioperatively, the general goal is to reduce sympathetic surges associated with intubation, reduce the physiological burden of pneumoperitoneum, and provide adequate analgesia for the smooth postoperative recovery.

Multimodal and opioid-sparing strategies are now increasingly favored as approaches to enhance recovery profiles and reduce adverse effects [5]. Pneumoperitoneum has been shown to increase the

levels of circulating catecholamines and vasopressin, which in turn leads to an increase in mean arterial pressure and systemic vascular resistance [2]. Several adjuncts have been investigated to improve the hemodynamic stability of these events, such as β-blockers, vasodilators, magnesium sulfate, lignocaine, clonidine, and dexmedetomidine [1].

Dexmedetomidine is highly selective α2-adrenergic agonist that causes central sympatholysis and sedation, and causes mild analgesia without a significant respiratory depression [6]. It is well established for attenuating the hemodynamic changes associated with laryngoscopy and reducing anesthetic requirements [7]. However, bradycardia and hypotension may occur, particularly with rapid administration [7].

In many settings, resource constraints encourage the use of simple multimodal combinations. A mixture of paracetamol, tramadol, lignocaine, and magnesium sulfate—referred to as "Shivmix"—provides synergistic benefits for hemodynamic control and analgesia [8]. Lignocaine blunts airway-related sympathetic reflexes [9], magnesium sulfate reduces catecholamine release through its calcium-antagonist and NMDA-modulating properties [10], tramadol offers dual-mechanism analgesia, and paracetamol contributes central analgesic action with limited hemodynamic impact.

Despite widespread use of dexmedetomidine and growing interest in opioid-free anesthesia (OFA), direct comparisons between dexmedetomidine and this multimodal non-opioid infusion remain scarce. Based on pharmacologic differences, we anticipated that dexmedetomidine would better blunt acute pressor response to laryngoscopy, whereas the multimodal combination might provide superior postoperative analgesia.

MATERIALS & METHODS

Study Design and Setting

Followed by receiving approval from "Institutional Ethics Committee (IEC)", this randomized, double-blind, prospective, active-controlled clinical research was carried out in a teaching facility for tertiary care. Written informed consent was given by each participant, and all procedures followed the Declaration of Helsinki's.

Patient Selection

Adults scheduled for elective laparoscopic abdominal surgery (primarily laparoscopic cholecystectomy) who were between the ages of 18 and 50, of either sex, and classified as ASA physical status I or II have been eligible. If a patient refused to participate, they were excluded, had an ASA status ≥III, age outside the defined range, major systemic disease (e.g., uncontrolled hypertension, cardiac disease, diabetes, COPD), expected difficult airway, emergency surgery, pregnancy or lactation, psychiatric illness, history of substance abuse, or recorded allergy to study medication. 120 qualified patients were enrolled.

Randomization and Blinding

Participants were divided into 2 groups (n=60 in each group) employing computer-generated randomization procedure. The sealed, opaque envelopes used for allocation to groups were opened just before induction. Patients and outcome assessors were blind to the type of infusion because it has been produced by an anesthesiologist who has not been included in intraoperative management or data collection.

Intervention Protocol

Standard ASA monitoring (pulse oximetry, ECG, non-invasive blood pressure) has been conducted after the patient reached the operating room, and baseline vital signs were documented. Patients were instructed to score their postoperative pain utilizing 10-cm VAS(Visual Analog Scale).

Group A: Over ten minutes, 100milliliters of normal saline were diluted with 1μg/kg of dexmedetomidine.

Group B: For the same duration, a mixture comprising 20mg/kg of paracetamol, 2mg/kg of tramadol, 1.5mg/kg of lignocaine, and 40mg/kg of magnesium sulfate in 100mL of saline has been infused.

Both infusions were completed 15 minutes before laryngoscopy. Pre-induction hemodynamic readings were recorded at the end of the infusion.

A uniform anesthetic technique was used in all cases: fentanyl 1μg/kg and propofol (approximately 2mg/kg) for induction, followed by succinylcholine 1.5mg/kg for tracheal intubation. Intubation has been performed using a Macintosh laryngoscope. Maintenance consisted of oxygen–nitrous oxide (40%/60%), isoflurane titrated to ~1% end-tidal concentration, and intermittent vecuronium boluses. Ventilation has been controlled to maintain end-tidal CO_2 at 35-40mmHg. Pneumoperitoneum was created using CO_2 at an intra-abdominal pressure of 12–15mmHg, with a 15–20° reverse Trendelenburg position.

Hemodynamic Monitoring

SpO_2, Heart rate (HR), diastolic blood pressure, systolic blood pressure have been assessed at baseline, after infusion (pre-induction), at intubation, and at 3, 5, 10, 30, 60, 90, and 120 minutes, depending on case duration. Fluids and, if required, ephedrine have been used to treat hypotension (SBP<90mmHg or >30% decline from baseline). Atropine 0.6mg IV has been employed to treat bradycardia (HR<50bpm).

Postoperative Analgesia Assessment

VAS scores were recorded at recovery and at 1, 2, 3, 4, 6, 12, and 24 hours. Diclofenac (75mg IM or 1.5mg/kg IV) has been administered as rescue analgesia for VAS≥4. Adverse effects—including sedation, PONV, shivering, and dizziness—were monitored for 24 hours.

Statistical Analysis

Hemodynamic change in HR, SBP, DBP through peri-intubation was primary endpoint. Time to first rescue analgesia, incidence of side effects, postoperative VAS scores were secondary endpoints. The sample size was determined using α=0.05 and 80% power for identifying 20% difference in mean arterial pressure. SPSS v24 has been employed for statistical analysis. The unpaired Student's t-test has been used to evaluate continuous variables, and repeated-measures ANOVA has been used for determining within-group trends. Chi-square or Fisher's exact test has been employed to evaluate categorical data. P-value of <0.05 has been considered significant.

RESULT

Patient Characteristics: All 120 patients (60 per group) completed the study. Groups have been comparable in baseline and demographic characteristics. Mean age has been 34.3±9.1 years in Group A vs. 33.8±8.7 years in Group B (p=0.79). Each group had a female predominance (85% in Group A and 81.7% in Group B), reflecting epidemiology of gallstone disease; gender distribution was similar between groups. All patients have been ASA I–II, with a comparable proportion of ASA II (18% in Group A vs. 15% in Group B, p>0.05). Duration of surgery was also similar: ~75% of cases in both groups lasted under 60 minutes (remaining cases under 90 minutes), with no significant difference in operative time.

Hemodynamic Response to Intubation: Both regimens effectively blunted the expected rise in heart rate during laryngoscopy and intubation (see **Figure 1**). The baseline HR (before infusion) was 88.8±13.2bpm in Group A and 85.8±11.6bpm in Group B (p>0.05). After study drug infusion (pre-induction), HR decreased in both groups due to the premedication effect (to 72.9±10.5 vs. 73.0±10.8 bpm, respectively). At intubation, a slight increase in HR occurred in both groups, but peak values remained below baseline in most patients. The maximum HR during intubation was 75.3±9.5bpm in Group A vs. 77.6±8.3bpm in Group B (p=0.15). By 3 minutes post-intubation, HR averaged 71.1±9.3 (Group A) vs. 74.5±7.8bpm (Group B), and at 5 minutes, 69.3±9.4 vs. 72.5±8.2bpm, but these differences have been not statistically significant (p>0.05). Thereafter, heart rates in both groups gradually trended back toward baseline over 10–30 minutes. There have been no statistical differences in HR between groups at any time point during the operation (Figure 1). In particular, 2 patients (3.3%) in Group A developed bradycardia (HR<40bpm) during or immediately following the dexmedetomidine loading infusion; bradycardia was brief and transient in both cases, improving promptly with atropine 0.6mg IV. None of the patients in Group B had an HR below 50bpm. No episodes of tachycardia (HR>100bpm) occurred in Group A, and only 1 patient in Group B had a brief HR of ~102bpm during pneumoperitoneum (resolving without intervention). Thus, regarding chronotropic response, both treatments were equally effective in attenuating the laryngoscopy-induced heart rate increase.

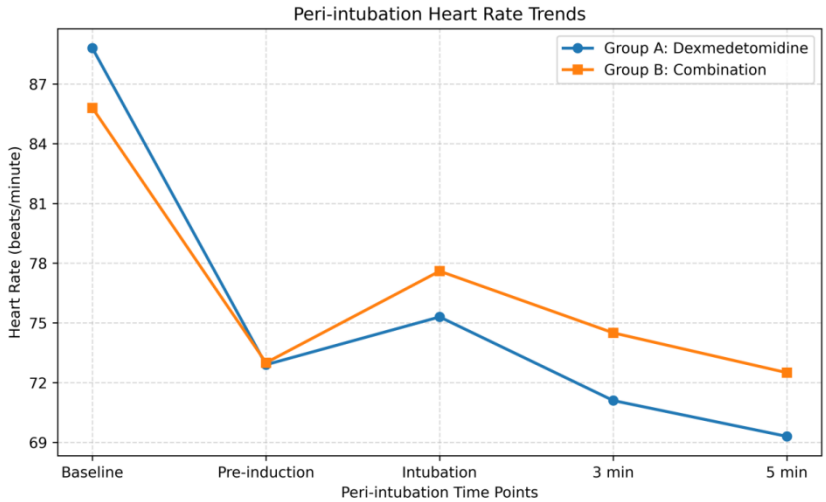

Figure-1: The Heart Rate (HR) trend at key peri-intubation time points (mean ± SD). Group A (Dexmedetomidine) vs Group B (Paracetamol + Tramadol + Lignocaine + $MgSO_4$

Blood Pressure Response: Systolic and diastolic blood pressure profiles of two groups are illustrated in Figure 2 and summarized in Table 1. Baseline mean systolic BP has been relatively higher in Group A (128.6 ± 12.9mmHg) compared to Group B (116.3 ± 7.4mmHg). This baseline difference reached statistical significance (P<0.001), presumably due to random variability. However, after the administration of study drugs (pre-induction), SBP decreased in both groups: pre-induction SBP fell to 114.1 ± 13.1mmHg in Group A and 110.9 ± 6.9mmHg in Group B (a reduction of ~11% and ~5% from respective baselines).

The drop has been relatively greater in the dexmedetomidine group, and inter-group difference at pre-induction has been modestly significant (P<0.05).

At the critical moment of intubation, Group A showed significantly less increase in SBP compared to Group B. The intubation SBP averaged 118.1 ± 12.6 mmHg in Group A versus 113.6 ± 7.2mmHg in Group B (P<0.05). In fact, in Group A, SBP remained close to the pre-induction level at intubation (reflecting effective blunting of the laryngoscopic pressor response), whereas in Group B, there was a slight rise from pre-induction (though still below baseline). The difference became more pronounced 3 minutes after intubation: SBP was 113.4 ± 12.6mmHg in Group A V/S 109.9 ± 7.4mmHg in Group B (P<0.05). A similar pattern was noted at 5 minutes post-intubation (111.6 ± 11.5 vs 108.5 ± 6.8 mmHg, P<0.05). These findings indicate that dexmedetomidine maintained a lower arterial pressure during the immediate post-intubation period. By 10 minutes post-intubation, SBP values in the two groups converged (111.3 ± 11.6mmHg V/S 109.4 ± 7.2mmHg, P=0.27). Thereafter, during steady-state pneumoperitoneum (30 to 60 minutes), the SBP remained stable and showed no significant differences between groups. At 30 minutes intraoperatively, SBP was 109.4 ± 11.1mmHg in Group A vs 107.1 ± 7.1mmHg in Group B (P=0.22). At 60 minutes, SBP was 109.3 ± 10.9 vs 107.6 ± 7.9 mmHg (P = 0.40). Near the end of surgery (90-minute mark, applicable in ~35% of patients with longer duration), Group A had a slight uptick in SBP to 113.4 ± 10.7 mmHg while Group B remained around 106.8 ± 6.8 mmHg, making SBP again significantly lower in Group B at that point (P<0.05). This late difference might be attributed to fading of dexmedetomidine's effect over time, as no supplemental doses were given.

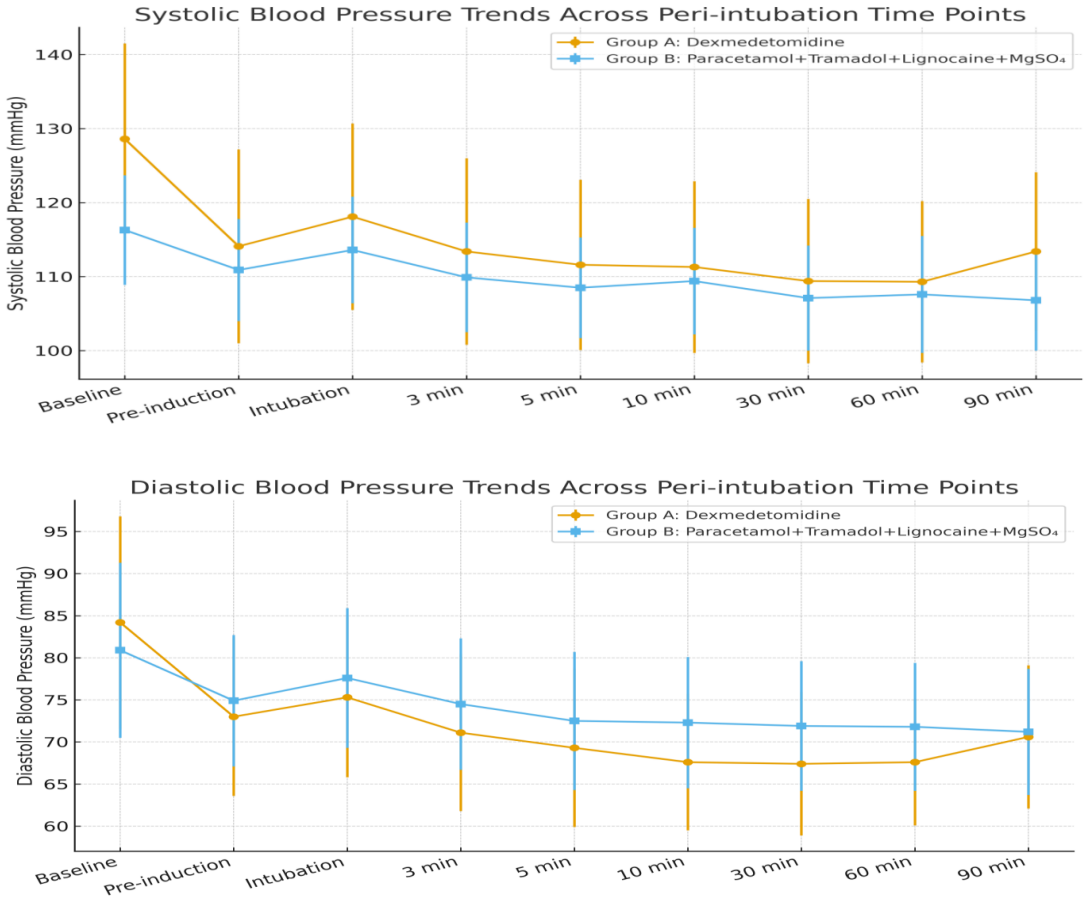

Figure-2: Blood pressure (BP) trend at key peri-intubation time points (mean ± SD). Group A (Dexmedetomidine) vs Group B (Paracetamol + Tramadol + Lignocaine + $MgSO_4$).

Diastolic blood pressure (DBP) followed a trend broadly similar to SBP (Table 1). Dexmedetomidine consistently resulted in lower DBP readings compared to the combination group from pre-induction through most of the intraoperative period. For instance, pre-induction DBP was 73.0 ± 9.4 mmHg in Group A vs 74.9 ± 7.8 mmHg in B (P<0.05). During intubation, Group A's mean DBP was 75.3 ± 9.5mmHg vs 77.6 ± 8.3mmHg in B (P<0.05). At 3 min post-intubation, DBP in Group A had decreased to 71.1 ± 9.3mmHg compared to 74.5 ± 7.8mmHg in B (P<0.05). This significant difference persisted at 5, 10, 30, and 60 minutes (with Group A maintaining slightly lower DBP than Group B, all P<0.05 at those points).

By 90 minutes, DBP was nearly equivalent (≈71 mmHg in both, $P = 0.60$). In summary, dexmedetomidine achieved a greater attenuation of SBP or DBP responses related to laryngoscopy and intubation, particularly evident in first 5 minutes after intubation (Figure 2). Thereafter, with surgical stimulation underway, blood pressures were similarly controlled in both groups, except for a minor divergence toward the end of longer cases.

Table-1: Intraoperative Blood Pressure (mean ± SD)

Time Point	Group A: Dexmedetomidine (mmHg)	Group B: Combination (mmHg)	*P* value (A vs B)
Systolic BP			
Baseline (pre-drug)	128.6 ± 12.9	116.3 ± 7.4	< 0.0001 ‡
Pre-induction (post-drug)	114.1 ± 13.1	110.9 ± 6.9	0.03 *
During intubation	118.1 ± 12.6	113.6 ± 7.2	0.02 *
3 min after intubation	113.4 ± 12.6	109.9 ± 7.4	0.04 *
5 min after intubation	111.6 ± 11.5	108.5 ± 6.8	0.047 *
10 min	111.3 ± 11.6	109.4 ± 7.2	0.27
30 min	109.4 ± 11.1	107.1 ± 7.1	0.22
60 min	109.3 ± 10.9	107.6 ± 7.9	0.40
90 min	113.4 ± 10.7	106.8 ± 6.8	0.03 *
Diastolic BP			
Baseline	84.2 ± 12.6	80.9 ± 10.4	0.04 *
Pre-induction	73.0 ± 9.4	74.9 ± 7.8	0.04 *
During intubation	75.3 ± 9.5	77.6 ± 8.3	0.048 *
3 min after intubation	71.1 ± 9.3	74.5 ± 7.8	0.03 *
5 min after intubation	69.3 ± 9.4	72.5 ± 8.2	0.04 *
10 min	67.6 ± 8.1	72.3 ± 7.8	0.01 *
30 min	67.4 ± 8.5	71.9 ± 7.7	0.02 *
60 min	67.6 ± 7.5 §	71.8 ± 7.6 §	0.03 *
90 min	70.6 ± 8.5 †	71.2 ± 7.5 †	0.60

Notes: P-value (unpaired t-test, between Group A and Group B) at each time. Consider P<0.05 to be significant (marked by *). Significant baseline difference noted despite randomization. § At 60 min, n=58 in Group A, n=58 in Group B (2 patients in each group had completed surgery by this time). † At 90 min, n=16 in Group A, n=19 in Group B (only patients with longer surgical duration included).

Overall, dexmedetomidine was more effective at reducing pressor response to laryngoscopy and intubation (systolic and diastolic pressures have been both significantly lower in immediate post-intubation period in the dexmedetomidine group). The multi-modal infusion of paracetamol, tramadol, lignocaine, magnesium also blunted the surge in haemodynamics, but in the initial minutes after intubation, the effect was comparatively milder. During the induction phase, both groups showed a stable cardiovascular profile without significant fluctuations of hypertension or hypotension during the laparoscopic surgery. No patients needed to receive any antihypertensive medication during the operation, nor was any additional fentanyl administered. Temporary mild hypotension (SBP 85-90 mmHg) has been observed in 3 subjects (5%) in Group A and 2 subjects (3.3%) in B during pneumoperitoneum, who were all administered intravenous fluid without vasopressor use. No arrhythmias or ischemic changes were detected during the process in any of the participants.

Postoperative Pain and Analgesia: The postoperative pain pattern within the first 24 hours was significantly different among study groups. Patients in Group B (multimodal group) consistently reported lower VAS scores during the early recovery phase when compared to those in Group A (dexmedetomidine alone) (Figure 3). On arrival to the recovery area (0 hour), mean VAS has been 2.1±1.3 in Group B vs 3.2±1.5 in Group A (P<0.05). By first hour, analgesia remained superior in Group B (1.2±0.9 V/S 1.6±1.1; P<0.05). Similar advantages were observed at 2 hours (1.5±1.0 V/S 1.9±1.1; P<0.05) and 3 hours (1.8±1.1 V/S 2.2±1.2; P<0.05). Pain scores rose gradually after 4 hours as drug effects diminished, but Group B continued to outperform Group A (2.0±1.2 vs 2.7±1.3 at 4h; 2.6±1.4 vs 3.6±1.5 at 6 h; both P<0.001). The multimodal regimen was also shown to provide superior pain control at 12-24hrs(Group B had pain scores of 2.3 V/S 3.5 and 2.4 V/S 3.6, respectively; P<0.001).

This is consistent with these findings, as rescue analgesic requirements were higher in the patients receiving dexmedetomidine. Diclofenac was required in 38/60 patients (63%) in Group A, compared to only 18/60 (30%) in Group B (χ^2 test, P<0.001). There has also been significant difference in time to first rescue

dose, with Group B patients waiting on average for 5.8 hours after surgery to require analgesia, while Group A required it at ~3.4 hours. In addition, of the 70% of Group B patients (42/60) who were comfortable (VAS≤3) without supplemental analgesia during at least 6 hours after surgery, only 33% of Group A patients (20/60) achieved this result. This long pain-free period is a sign of how effective the multimodal combination is in managing early postoperative pain.

Neither group experienced severe pain (VAS >7), and only one received rescue medication when VAS reached ~4 or when requested. 8 patients in Group A and 5 patients in Group B had shoulder pain from residual CO_2 noted during the first postoperative day and were treated conservatively with positioning and analgesia. The multimodal group seemed to have better patient comfort (informal impression), with a lower number of patients reporting postoperative discomfort.

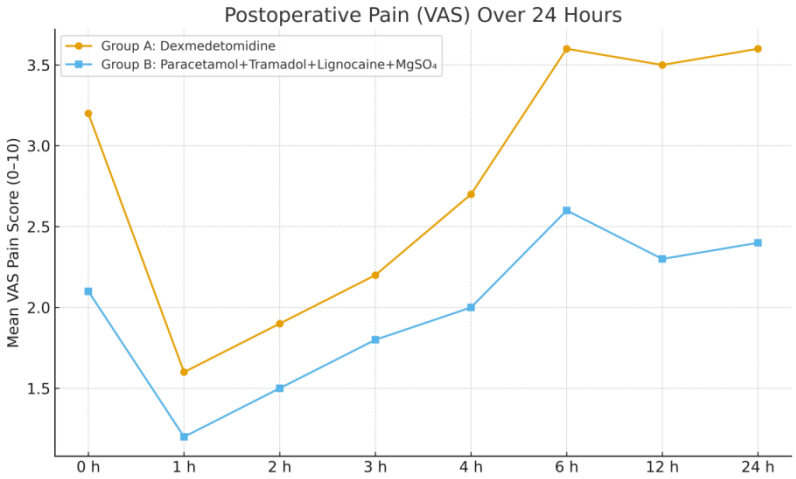

Figure-3: Postoperative pain intensity (VAS 0–10) at rest over 24 hours. Group B shows consistently lower VAS at all time points

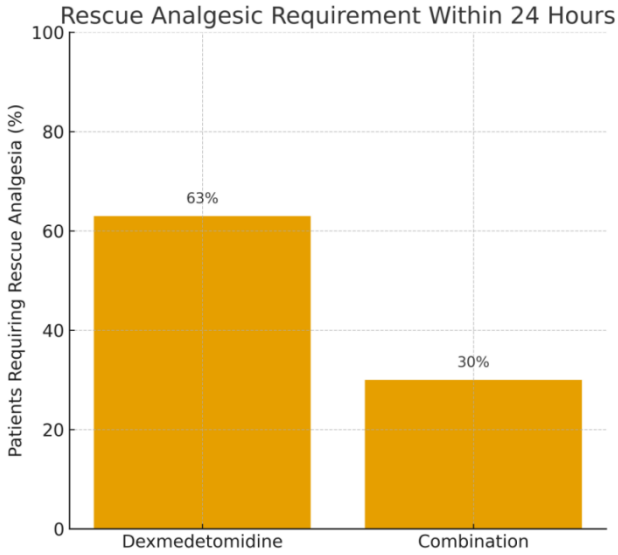

Figure-4: Proportion of patients requiring rescue analgesia within 24 hours (Dexmedetomidine 63% vs Combination 30%)

Adverse Effects: Incidence of side effects was low and didn't vary significantly among groups, except for bradycardia as noted. Intraoperatively, two patients (3.3%) in Group A developed bradycardia (<40 bpm) during the dexmedetomidine infusion; both were young ASA I individuals. These episodes were transient and promptly treated with atropine, with no further hemodynamic instability. Mild hypotension (SBP 85–90mmHg) has been observed in 5% of Group A and 3.3% of Group B patients, as mentioned, with no case of severe hypotension (< 80 mmHg) in either group. No patient had bronchospasm or oxygen desaturation < 94% during induction or surgery.

Postoperative nausea and vomiting (PONV) prophylaxis (ondansetron given intraoperatively) was

effective in most patients. Only 4 patients (6.7%) in Group A and 3 patients (5%) in Group B reported mild nausea in PACU or ward, and only one patient in each group had a single episode of vomiting in the first 6 hours. All responded with another dose of ondansetron. The patient sedation scores were not formally recorded, but patients in Group A seemed to be slightly more sedated in immediate postoperative period (possibly as a result of residual effect of dexmedetomidine); no patients required naloxone or other intervention for sedation or respiratory depression. All patients were arousable and breathing adequately. 3 patients in Group A and 2 in Group B shivered (treated with warming and low-dose IV tramadol as necessary). No allergic reaction nor emergence of agitation was observed. Both regimens were safe and well tolerated in general, and no major side effects have been attributed to study drugs.

DISCUSSION

Sympathetic response to laryngoscopy and tracheal intubation has been well described as physiologic reflex, and various drugs have been studied to reduce these sudden, dramatic hemodynamic changes. Both dexmedetomidine and paracetamol–tramadol–lignocaine–magnesium combination were effective in reducing increase in HR and blood pressure at intubation. Ability to inhibit central sympathetic tone may explain its more effective action in suppressing both systolic and diastolic blood pressure during early post-intubation period, as reported previously [7].

The multimodal regimen was also clinically acceptable and provided clinically acceptable stability, although dexmedetomidine had a stronger attenuation of the immediate cardiovascular response. The advantage of combination may be due to the complementary mechanisms of lignocaine and magnesium sulfate: Lignocaine is thought to have an effect on airway reflexes and sympathetic outflow [9], and magnesium affects reducing the release of catecholamines through calcium antagonism and NMDA receptor modulation[2][10]. Importantly, the multimodal approach was not correlated with the bradycardia that occurred in a subset of those patients who were treated with dexmedetomidine.

One difference was observed regarding postoperative analgesia. The multimodal group had significantly lower VAS scores and needed fewer rescue analgesics. This is consistent with the principles of multimodal and opioid-sparing analgesia, wherein utilization of various agents with distinct mechanisms of action yields sustained analgesic effects [5,8]. These results reflect a combined mechanism with tramadol and a central mechanism with paracetamol, supporting the value of this combination in the early postoperative recovery. These results are consistent with those found in the literature of opioid-free anesthesia (OFA), which have demonstrated that lidocaine and magnesium infusions reduce postoperative pain and analgesic needs [8,10,11].

Dexmedetomidine has clinical potential to be especially useful under circumstances where there is the need for tight control of immediate pressor response (e.g., in patients with limited cardiovascular reserve, neurosurgical conditions). The multimodal approach, conversely, is more appropriate for a situation that emphasizes postoperative comfort, opioid minimization, or when dexmedetomidine is not available or contraindicated. Both treatments were well tolerated, and the adverse events were limited to the expected pharmacologic effects.

The overall findings confirm the importance of an individualized anesthetic plan. Both approaches have roles, and selection should be based on the balance between intraoperative haemodynamic objectives and postoperative analgesic requirements.

CONCLUSION

Both dexmedetomidine and multimodal “Shivmix” (non-opioid multimodal) were successful at reducing the haemodynamic effects of laryngoscopy and intubation in patients experiencing laparoscopic surgery. Dexmedetomidine provided better control of arterial blood pressure during intubation and immediately after intubation, while the multimodal technique maintained significantly greater postoperative analgesia and met the objectives of an “opioid-free” anesthesia technique[11]. Where opioids are limited or dexmedetomidine use is restricted, this simple multimodal regimen is a viable strategy to achieve adequate postoperative pain control and maintain hemodynamic stability. These strategies can be personalized to the patient; dexmedetomidine may be preferable if tight peri-intubation hemodynamic control is desired, and the “Shivmix” combination may be more useful in prolonging postoperative analgesia and improving recovery. The results support the feasibility of opioid-sparing multimodal anesthesia in general surgery and suggest that adequate pain management could be obtained without utilization of traditional opioids. These techniques will be optimized by further research, such as studies in high-risk patients and in various surgical settings, and by examining the possibility of combining these techniques for additive improvements.

Declaration by Authors

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Conflict of Interest: NIL

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ETHICS COMMITTEE

(For Biomedical Health & Research)
Room No. 125, Ist Floor, GSVM Medical College, Kanpur
E-mail: ecgsvm@gmail.com

Ref. No. EC/196/Oct./2021 Date: 16/10/2021

To,

Dr. Indumathi PS
Junior Resident
Department of Anesthesia
GSVM Medical College, Kanpur

Study Title: "A Comparative Study of Heamodynamic Response During Endotracheal Intubation Between Injection Dexmedetomidine Versus Combination of Paracetamol + Tramadol + Lignocaine + Magnesium Sulphate In Patients Undergoing Abdominal Laparoscopic Surgeries".

Ref No.: EC/BMHR/2021/88, Dated 18-09-2021

Sub: Decision of Ethics Committee, GSVM Medical College, Kanpur for above protocol.

Dear Dr. Indumathi,

The meeting of Ethics Committee (For Biomedical Health & Research), GSVM Medical College, Kanpur was held on 12, October, 2021 at 03:00 pm. In CRS Committee Hall First Floor, GSVM Medical College, Kanpur under the chairmanship of Dr. Meera Agnihotri. Following Members attended the meeting held on 12-10-2021 –

S.No.	Name	Qualification	Affiliation with Institute	Designation in Committee
1.	Dr. Meera Agnihotri	MBBS, M.S., DGO (Obs. & Gynae.), FICOG, FICS, FIC, MCH	No	Chairperson
2.	Dr. Vinay Krishna	MBBS, MS, M.Ch (Cardio Vascular & Thoracic Surgery)	Yes	Member/Clinician
3.	Dr. G.C. Upadhyay	MBBS, MD (Microbiology)	Yes	Member/Basic Scientist
4.	Dr. Neena Gupta	MBBS, MS (Obst. &Gyne.)	Yes	Member/Clinician
5.	Dr. G.D. Yadav	MBBS, MS (Surgery)	Yes	Member/Clinician
6.	Dr. Saurabh Agarwal	MBBS, MD (Medicine)	Yes	Member Secretary/Clinician
7.	Dr. Pooja Agarwal	MBBS, MD (Pharmacology)	Yes	Member/Basic Scientist
8.	Mr. Ajay Singh Bhadauria	LLB	No	Member / Legal Expert
9.	Mr. Ajay Goel	B.Com	No	Member / Layman

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ETHICS COMMITTEE

(For Biomedical Health & Research)
Room No. 125, Ist Floor, GSVM Medical College, Kanpur
E-mail: ecgsvm@gmail.com

5. No deviations from, or changes in the protocol and informed consent document should be initiated without prior written approval by the Ethics Committee, GSVM Medical College, Kanpur. The investigator should promptly report to the Ethics Committee, any deviations from or changes in the protocol to eliminate immediate hazards to the research participants and about any new information that may affect adversely the safety of the research participants or the conduct of the study.
6. You are required to inform Ethics Committee about the commencement of study & thereafter submit 6 monthly reports from date of issue of this approval letter on prescribed format by e-mail/hard copy. At the time of completion of study you must file your site specific final closure report to Ethics Committee within 2 weeks.
7. Clinical trials shall be registered at Clinical trials Registry of India before enrolling the first patient for the study.
8. Any failure to comply with the conditions laid will lead to automatic withdrawal of approval given for the study.

(Dr. Saurabh Agarwal)
Member Secretary
Member Secretary
Ethics Committee
GSVM Medical College, Kanpur