ORIGINAL RESEARCH

A comparative study designed to investigate the effects of perioperative infusion of Lidocaine versus Dexmedetomidine on hemodynamic parameters during the perioperative period in patients undergoing laparoscopic cholecystectomy surgery

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Revised date: 26 December, 2023 Acceptance date: 25 January, 2024

ABSTRACT

Background: Laparoscopic cholecystectomy (LC), a procedure associated with significant hemodynamic alterations due to factors such as pneumoperitoneum, patient positioning, and hypercapnia resulting from CO2 absorption, had the paramount goal of achieving optimal postoperative pain control and swift recovery. **Aim and Objective:**To investigate the impact of perioperative infusion of Lidocaine versus dexmedetomidine on hemodynamic parameters in patients undergoing LC.**Methodology:**The study, a non-randomized controlled trial conducted in a hospital setting, took place from 2018-2019 in the department of anaesthesia at Subharti Medical College and Hospital, Dehradun, in India. In this study, patients of either gender between the ages of 18 and 60 were scheduled for laparoscopic cholecystectomy. To perform a laparoscopic cholecystectomy, 124 adult patients of either sex who had ASA grades I or II were admitted. They were randomly split into two groups of 62 patients each.**Result:**In Group D, the most prevalent side effect was observed to be bradycardia, occurring in a notable percentage of cases. Additionally, dry mouth was reported in 19.35% of instances, followed by hypotension in 12.90%, and hypertension in 3.22% of cases. Conversely, in Group L, the predominant side effect was noted to be bradycardia, documented in 22.58% of instances. Dry mouth was reported in 17.74%, hypotension in 9.67%, and notably, no instances of hypertension were recorded in this group.**Conclusion:**The study concluded that both lidocaine and dexmedetomidine infusions were effective and safe adjuvants for enhancing recovery after LC. However, the postoperative recovery profile was notably superior with dexmedetomidine infusion. This suggested that dexmedetomidine may be considered the preferred adjuvant, particularly in the context of outpatient laparoscopic surgery. The study encompassed dexmedetomidine, hemodynamic, perioperative, laparoscopic cholecystectomy, surgery, and Quality of Recovery (QoR).

Keywords: Dexmedetomidine, hemodynamic, perioperative,laparoscopic cholecystectomy, surgery,QoR (Quality of Recovery).

INTRODUCTION

Laparoscopic cholecystectomy has emerged as a widely practiced surgical intervention, established as the preferred therapeutic approach for managing symptomatic cholelithiasis [1]. This minimally invasive methodology confers numerous advantages over traditional open cholecystectomy, encompassing mitigated post-operative pain, reduced incision size, diminished blood loss, abbreviated hospitalization duration, accelerated functional recuperation, and an earlier resumption of preoperative activities and occupational responsibilities [2-4]. Despite the evident reduction in postoperative pain associated with laparoscopic procedures, it does not entirely

abate and remains a significant consideration in clinical management [5]. The presence of pain, albeit alleviated, can contribute to heightened morbidity and constitutes a prevalent factor leading to prolonged hospital stays subsequent to laparoscopic cholecystectomy [6,7]. Patients commonly articulate complaints of back and shoulder discomfort, along with reported unease at the incision sites for ports [8]. Shoulder and sub-diaphragmatic pain manifest in approximately 12% to 60% of patients [9].The zenith of pain intensity is typically experienced within the initial hours postoperatively, gradually subsiding over a period of 2 to 3 days [10].

The insufflation of CO2 into the peritoneum to establish the requisite pneumoperitoneum for laparoscopy introduces consequential alterations in intraoperative ventilatory [4-8] and hemodynamic [9,10] parameters, thereby complicating the aesthetic management of laparoscopic procedures. The requisite patient positioning, whether head-down or head-up, during these interventions also contributes significantly to these physiological changes.

Postoperative recovery encompasses a multifaceted process with diverse outcomes, including pain, physiological parameters, adverse event occurrence, and psychological well-being. Multimodal analgesia has been advocated to address pain relief and mitigate opioid-related side effects. However, the quality of recovery extends beyond pain management, encompassing factors such as nausea, vomiting, duration of ileus, achievement of physical independence, comfort, and early ambulation. Systemic lidocaine has demonstrated effectiveness as an adjunct in alleviating postoperative pain, nausea, vomiting, reducing ileus duration, and shortening hospital stays [11-13]. It is posited that lidocaine acts as a genuine preventive analgesia agent by impeding the induction of central hyperalgesia, thereby enhancing the overall quality of postoperative recovery. Dexmedetomidine, a highly selective α-2 adrenoceptor agonist, contributes to sedation, analgesia, and sympatholysis. Its perioperative administration fosters hemodynamic stability and correlates with decreased postoperative analgesic requirements, reduced incidences of nausea, vomiting, and respiratory depression, thereby promoting an expedited postoperative recovery [14,15].

A study was conducted to investigate postoperative analgesia, characteristics of somato-visceral sensory block, and the stress response following intrathecal bupivacaine administration in women undergoing cesarean section [16,17]. The study included 60 eligible parturients undergoing cesarean section who were administered intrathecal bupivacaine alone or in combination with dexmedetomidine. The addition of dexmedetomidine was observed to prolong the duration of motor and sensory blocks while reducing the need for supplemental doses of lignocaine and fentanyl. The study concluded that the incorporation of dexmedetomidine into bupivacaine resulted in improved somato-visceral sensory block characteristics during the intraoperative period and enhanced postoperative analgesia, with no discernible impact on Apgar scores, side effects, or the stress response [16,17].

The assessment of Quality of Recovery (QoR) has been conducted through the utilization of the Global QoR-40 questionnaire [16]. Numerous studies have consistently demonstrated that intravenous lidocaine contributes to an enhanced QoR following laparoscopic cholecystectomy. Dexmedetomidine, recognized for its hemodynamic stabilizing properties and analgesic and anesthetic-sparing effects, has been associated with improved postoperative recovery, primarily attributed to a reduction in opioid consumption. Based on this rationale, our hypothesis posited that dexmedetomidine might yield a superior quality of recovery in the context of laparoscopic surgeries. To investigate this, the impact of intraoperative intravenous infusions of lidocaine and dexmedetomidine on postoperative pain reduction and the overall recovery profile in patients undergoing laparoscopic cholecystectomy was aimed to be assessed, leveraging the Global QoR-40 questionnaire. The study design involves the comparative analysis of the effects of lignocaine and dexmedetomidine, focusing on their influence on the hemodynamic response and postoperative analgesia, with the intent of substituting opioids in the management of patients undergoing laparoscopic cholecystectomy [16].

MATERIALS AND METHODS

The investigation was conducted as a non-randomized controlled trial within the Department of Anaesthesiology at aSubharti Medical College and Hospital, Dehradun, in India, spanning a duration of 12 months from 2018-2019. The study targeted patients scheduled for Laparoscopic Cholecystectomy within the age range of 18 to 60 years, irrespective of gender. A total of 124 adult patients, encompassing both sexes with ASA grades I or II, admitted for Laparoscopic Cholecystectomy, were randomly allocated into two groups, each comprising 62 individuals.

Upon securing approval from the institutional ethical committee, the 124 eligible adult patients with ASA grades I or II admitted to the College for Laparoscopic Cholecystectomy were randomly assigned to the two groups, each consisting of 62 participants. Subsequent to obtaining informed written consent from the patients, all 124 individuals were categorized into two groups: one group received a 2% intravenous preservative-free Lidocaine (administered as a bolus followed by infusion), while the other group received Dexmedetomidine (administered as a bolus followed by infusion).

The collected data underwent transformation into variables, coding, and entry into Microsoft Excel.

Subsequently, statistical analysis and evaluation of the data were conducted using SPSS-PC-21.

RESULTS

The study was a randomized controlled trial conducted in the Department of Anaesthesiology at a Subharti Medical College and Hospital, Dehradun, in India. It enrolled 124 adult patients, encompassing both sexes, with either ASA grade I or grade II, admitted for Laparoscopic Cholecystectomy. The participants were randomly divided into two groups, with each group comprising 62 individuals. Group L received a 2% intravenous preservative-free Lidocaine, administered as a bolus followed by infusion. On the other hand, Group D received Dexmedetomidine, administered as a bolus followed by infusion.

Table 1: Demographic data distribution of study subject and comparison between both groups

Demographic Distribution		Number (%)	
		Group D (n=62)	Group L (n=62)
Gender	Male	39 (62.90 %)	43 (69.35 %)
	Female	23 (37.09 %)	19 (30.64 %)
ASA Grade	Grade I	52 (83.87 %)	55 (88.70 %)
	Grade II	10 (16.12 %)	7 (11.29 %)
Mean age in years		55.54 ± 6.66	57.36 ± 4.89
Weight (Kgs)		72.84 ± 8.74	80.03 ± 9.46

Table 1 presented the demographic distribution of study subjects and a comparative analysis between two groups, Group D and Group L. Firstly, with regard to the gender distribution, it was observed that in Group D, 62.90% of participants were male, while 37.09% were female. In contrast, in Group L, there were 69.35% male participants and 30.64% female participants. Turning to the ASA Grade (American Society of Anesthesiologists), it was found that in Group D, the majority (83.87%) were classified as Grade I, with the remaining 16.12% falling into Grade II. Meanwhile, in Group L, 88.70% were in Grade I, and 11.29% were categorized as Grade II.The mean age of participants in Group D was reported to be 55.54 years with a standard deviation of 6.66, whereas in Group L, it was noted to be 57.36 years with a standard deviation of 4.89. Additionally, the average weight in Group D was recorded as 72.84 kg with a standard deviation of 8.74, and in Group L, it was documented as 80.03 kg with a standard deviation of 9.46.

Table 2:A comparative analysis of SBP and MAP at distinct phases of the perioperative period in both study groups.

		Group D (n= 62)	Group L (n= 62)	*p-value**
		Mean ± SD		
SBP (mmHg)	Preoperative	119.77 ± 11.52	119.33 ± 8.69	0.71
	After bolus drug	117.29 ± 7.66	117.63 ± 6.18	0.83
	After induction	119.73 ± 7.08	120.96 ± 7.07	0.49
	After intubation	118.31 ± 7.77	119.89 ± 6.66	0.26
	After pneumo-peritoneum1min	115.21 ± 10.03	123.39 ± 7.68	0.001
	After pneumo-peritoneum15min	119.74 ± 6.10	127.25 ± 6.09	0.001
	After pneumo-peritoneum30min	113.10 ± 10.84	123.05 ± 5.82	0.001
	After pneumo-peritoneum 45min	109.46 ± 11.90	120.37 ± 7.68	0.001
	After pneumo-peritoneum 60min	109.84 ± 9.96	117.31 ± 6.26	0.001
	Postreleasepneumo-peritoneum	107.48 ± 10.30	116.49 ± 7.48	0.001
	Postextubation	119.12 ± 6.90	118.56 ± 5.99	0.71
MAP (mmHg)	Preoperative	89.35 ± 7.13	88.88 ± 6.32	0.77
	After bolus drug	87.26 ± 6.07	89.87 ± 6.01	0.06
	After induction	91.14 ± 5.68	94.16 ± 8.03	0.07
	After intubation	86.77 ± 6.33	92.59 ± 8.13	0.01
	After pneumo-peritoneum1min	86.88 ± 6.94	93.45 ± 6.15	0.001
	After pneumo-peritoneum15min	90.47 ± 3.76	95.81 ± 6.58	0.010
	After pneumo-peritoneum30min	86.35 ± 7.95	91.65 ± 7.40	0.010
	After pneumo-peritoneum45min	84.63 ± 7.02	89.46 ± 5.82	0.010
	After pneumo-peritoneum60min	83.35 ± 6.33	86.89 ± 4.65	0.010
	Postreleasepneumo-peritoneum	80.89 ± 7.91	86.02 ± 6.28	0.010
	Postextubation	86.11 ± 5.11	90.17 ± 5.15	0.010

** $p<0.05$ (Significant)*

In **Table 2**, valuable insights into the effects of perioperative infusions of Lidocaine and dexmedetomidine during laparoscopic cholecystectomy surgery were provided by the data from the study. A comparison was made between Group D (receiving Lidocaine) and Group L (receiving dexmedetomidine). In the preoperative phase, comparable Systolic Blood Pressure (SBP) levels were exhibited by both groups, indicating a similar baseline before intervention (p-value = 0.71). This suggested that the randomization process effectively balanced the two groups at the outset.

During the intraoperative period, particularly after bolus drug administration, induction, and intubation, no statistically significant differences were observed in SBP between the two groups (p-values ranging from 0.26 to 0.83). However, distinct variations emerged after the initiation of pneumo-peritoneum. At 1, 15, 30, 45, and 60 minutes after pneumo-peritoneum, as well as post-release and post-extubation, significantly higher SBP was consistently displayed by Group L compared to Group D (p-values = 0.001). This indicated a notable and consistent hemodynamic response to dexmedetomidine infusion during specific phases of laparoscopic cholecystectomy surgery. The findings regarding SBP were aligned with the study's aim of assessing the effects of the two different perioperative infusions on hemodynamic parameters. The data implied that dexmedetomidine infusion was associated with a significant increase in SBP compared to Lidocaine, particularly during the pneumo-peritoneum phase. These variations were considered crucial in understanding and managing the hemodynamic responses in patients undergoing laparoscopic cholecystectomy surgeries, providing valuable information for perioperative care decisions.

Detailed insights into the variations in Mean Arterial Pressure (MAP) at different time points during laparoscopic cholecystectomy surgery were provided by the study comparing the effects of perioperative infusion of Lidocaine and dexmedetomidine. Both Group D and Group L exhibited comparable baseline MAP levels before intervention, with mean values of 89.35 ± 7.13 and 88.88 ± 6.32, respectively (p-value = 0.77). This suggested that the baseline MAP was similar between the two groups, indicating a balanced starting point.

Following bolus drug administration, a slightly lower MAP was displayed by Group L compared to Group D, although this difference was not statistically significant (p-value = 0.06). After induction, intubation, and during pneumo-peritoneum at 1, 15, 30, 45, and 60 minutes, significant differences were observed (p-values ranging from 0.001 to 0.010). Group L consistently exhibited higher MAP values than Group D during these intraoperative stages, indicating a distinct hemodynamic response to dexmedetomidine infusion.

Significant differences in MAP between the two groups were observed post-release of pneumo-peritoneum, post-extubation, and subsequent intervals (p-value = 0.010). Higher MAP was maintained by Group L compared to Group D during these postoperative stages. The MAP data aligned with the trends observed in Systolic Blood Pressure (SBP), indicating that dexmedetomidine infusion was associated with a consistent increase in MAP compared to Lidocaine during specific phases of laparoscopic cholecystectomy surgery. These findings contributed to a comprehensive understanding of the hemodynamic effects of the two perioperative infusions and their potential implications for patient care during this surgical procedure.

Table 3: Comparative Analysis of Pulse Rate and sPO2 at Various Intervals in Both Groups

Pulse rate and sPO_2		**Group D (n = 62)**	**Group L (n = 62)**	***p-value****
		Mean ± SD		
Pulserate	Preoperative	77.06 ± 9.93	78.12 ± 7.55	0.52
	After bolus drug	78.23 ± 12.20	76.86 ± 7.34	0.83
	After induction	79.70 ± 11.61	81.18 ± 14.00	0.69
	After intubation	82.16 ± 7.89	86.96 ± 11.76	0.09
	After pneumo-peritoneum 1min	77.40 ± 8.06	87.58 ± 10.79	0.01
	After pneumo-peritoneum 15 min	77.53 ± 10.19	85.67 ± 10.79	0.01
	After pneumo-peritoneum 30 min	75.07 ± 10.01	84.70 ± 9.85	0.01
	After pneumo-peritoneum 45 min	74.27 ± 10.44	85.70 ± 9.50	0.001
	After pneumo-peritoneum 60 min	72.33 ± 6.71	83.87 ± 11.33	0.001
	Post release pneumo-peritoneum	72.13 ± 8.00	80.04 ± 12.34	0.01
	Post extubation	79.19 ± 12.25	85.93 ± 13.19	0.01
sPO_2	Preoperative	99.29 ± 0.85	99.52 ± 0.79	0.26
	After bolus drug	99.46 ± 0.97	99.57 ± 0.59	0.56
	After induction	99.74 ± 0.50	99.69 ± 0.46	0.63
	After intubation	99.74 ± 0.44	99.66 ± 0.66	0.54
	After pneumo-peritoneum 1min	99.72 ± 0.51	99.66 ± 0.53	0.65
	After pneumo-peritoneum 15 min	99.66 ± 0.57	99.60 ± 0.53	0.68

	After pneumo-peritoneum 30 min	99.66 ± 0.66	99.43 ± 0.59	0.20
	After pneumo-peritoneum 45 min	99.49 ± 0.79	99.52 ± 0.54	0.86
	After pneumo-peritoneum 60 min	99.43 ± 0.74	99.46 ± 0.59	0.86
	Post release pneumo-peritoneum	99.57 ± 0.59	99.68 ± 0.59	1.00
	Post extubation	99.66 ± 0.53	99.60 ± 0.53	0.66

** p<0.05 (Significant)*

Table 3, showed that the Pulse Rate and Oxygen Saturation (sPO2) at Different Time Points in the Study Comparing the Effects of Perioperative Infusion of Lidocaine and Dexmedetomidine during Laparoscopic Cholecystectomy Surgery.

The preoperative pulse rates were similar in both Group D and Group L, with mean values of 77.06 ± 9.93 and 78.12 ± 7.55, respectively (p-value = 0.52), suggesting a balanced baseline before intervention. No significant differences were observed in pulse rate after bolus drug administration and induction (p-values of 0.83 and 0.69, respectively). However, after intubation and during pneumo-peritoneum at various intervals (1, 15, 30, 45, and 60 minutes), significant differences were observed (p-values ranging from 0.001 to 0.09). Higher pulse rates were consistently demonstrated by Group L compared to Group D during these intraoperative stages.

Significant differences in pulse rate between the two groups were observed post-release of pneumo-peritoneum and post-extubation (p-values = 0.01). Higher pulse rates were maintained by Group L compared to Group D during these postoperative stages. The data on oxygen saturation (sPO2) during various phases of laparoscopic cholecystectomy surgery, comparing the effects of perioperative infusion of Lidocaine and dexmedetomidine in Group D and Group L, provide insights into respiratory status.

Similar sPO2 levels before intervention were exhibited by both Group D and Group L, with mean values of 99.29 ± 0.85 and 99.52 ± 0.79, respectively (p-value = 0.26), indicating a balanced baseline oxygen saturation between the two groups before the start of the surgical procedure. No significant differences were observed in sPO2 levels after bolus drug administration, induction, intubation, and during pneumo-peritoneum at various time intervals (1, 15, 30, 45, and 60 minutes). The p-values ranged from 0.20 to 0.86, suggesting that oxygen saturation remained comparable between Group D and Group L during these phases. No significant differences in sPO2 levels between the two groups were observed post-release of pneumo-peritoneum and post-extubation (p-values = 1.00 and 0.66, respectively). Oxygen saturation levels remained consistent between Group D and Group L in the postoperative period. The sPO2 data indicate that the choice of perioperative infusion (Lidocaine or dexmedetomidine) did not result in significant differences in oxygen saturation levels during laparoscopic cholecystectomy surgery. This information contributes to understanding the respiratory effects of the two perioperative interventions and suggests a comparable impact on oxygen saturation between the two study groups.

Table 4: Comparative Study of Side Effects in Both Study Groups

Side effects	Group D (n=62)	Group L (n=62)	*p-value**
Hypotension	8 (12.90%)	6 (9.67%)	0.56
Hypertension	2 (3.22%)	0 (0%)	-
Bradycardia	19 (30.64%)	14 (22.58%)	0.30
Tachycardia	6 (9.67%)	7 (11.29%)	0.77
Respiratory depression	0 (0%)	0 (0%)	-
Dryness of mouth	12 (19.35%)	11 (17.74%)	0.81
Fever	5 (8.06%)	2 (3.22%)	0.24
Other	4 (6.45%)	8 (12.90%)	0.22

*z-score proportion test, * p<0.05 (Significant)*

Table 4, indicated that the incidence of hypotension was 12.90% in Group D and 9.67% in Group L, with a non-significant p-value of 0.56. It was suggested that both Lidocaine and dexmedetomidine had a comparable impact on blood pressure, indicating no significant difference in the occurrence of hypotension between the two groups.Hypertension occurred in 3.22% of patients in Group D, while no cases were reported in Group L.

The occurrences of bradycardia 30.64% in Group D, 22.58% in Group L and tachycardia 9.67% in Group D, 11.29% in Group L did not exhibit significant differences between the groups, with p-values of 0.30 and 0.77, respectively. This indicated that both Lidocaine and dexmedetomidine had a comparable impact on heart rate during the perioperative period. No cases of respiratory depression were reported in either group (0% in both Group D and Group L). Various other side effects, including dryness of

mouth, fever, and other unspecified effects, showed no significant differences between the two groups, with p-values 0.24 & 0.22.

The comparative study indicated that both Lidocaine and dexmedetomidine infusions during laparoscopic cholecystectomy surgery resulted in a similar incidence of most reported side effects, including hypotension, bradycardia, tachycardia, dryness of mouth, fever, and other specified effects. The findings contributed to understanding the safety profiles of the two interventions in the context of hemodynamic parameters during the perioperative period.

DISCUSSION

The consideration of the hemodynamic response during laryngoscopy and endotracheal intubation dates back to as early as 1940. Burstein CL et al. were among the pioneers in identifying these hemodynamic changes during intubation and laryngoscopy in 1940. They also attributed the cause of this hemodynamic response to an increased sympathetic reaction stimulated by the laryngopharynx and epipharynx [18]. Prys-Roberts later confirmed and supported these findings. The sympathetic outflow to the heart, T1-4, and the sympathetic outflow to the adrenal medulla, T3-L3, play significant roles in these responses.

In the Dexmedetomidine group, the mean age was 55.54±6.66 years, while in the Lignocaine group, it was 57.36±4.89 years. The mean weight in the Dexmedetomidine group was 72.84±8.74 kgs, and in the Lignocaine group, it was 80.03±9.46 kgs. Both groups exhibited comparable demographic distributions. In the Dexmedetomidine group, 39 (62.90%) were males and 23 (37.09%) were females. In the Lignocaine group, 43 (69.35%) were male, and 19 (30.64%) were females.

The mean systolic blood pressure at baseline was comparable in both groups, measuring 119.77±11.52 mm Hg in group D and 119.33±8.69 mm Hg in group L. Following intubation, there was an increase in systolic blood pressure observed in both groups. However, the Dexmedetomidine group exhibited an attenuation of the sharp rise in systolic blood pressure compared to the Lignocaine group. This difference was statistically significant and persisted until 60 minutes post-intubation. After extubation, systolic blood pressure in both groups returned to the baseline range. This finding aligns with the observations of Barkha B et al [19], who also noted significant variations in systolic blood pressure between the Dexmedetomidine and placebo groups starting from ten minutes after drug administration, and this difference continued throughout the observation period, consistent with our study.

The mean arterial pressure at baseline was comparable in both groups, measuring 89.35±7.13 mm Hg in group D and 88.88±6.32 mm Hg in group L. Following the administration of the bolus drug and bolus infusion, no significant difference was observed between the two groups. However, after intubation, there was a notable attenuation of the pressor response in the Dexmedetomidine group compared to the Lignocaine group. This difference was statistically significant ($p < 0.05$) between the groups and persisted until post-extubation.

The findings of Barkha B et al [19] align with our study, as they observed statistically significant variations in mean arterial blood pressure between the Dexmedetomidine and placebo groups starting from ten minutes after drug administration, continuing throughout the observation period. Additionally, a study by Swarup VP et al [17] reported that the Dexmedetomidine group demonstrated control of the mean arterial pressure increase after intubation with a statistically significant difference compared to the Lignocaine group. This attenuation was observed until 10 minutes post-intubation, consistent with our study.

Adverse effects associated with dexmedetomidine, such as hypotension and bradycardia, have been reported in several studies. However, modifications to the protocols, including the slow infusion of a loading dose of dexmedetomidine, have significantly reduced the occurrence of these side effects. In our study, the most common side effect in group D was bradycardia (30.64%), followed by dryness of the mouth (19.35%), and hypotension (12.90%). In contrast, in group L, dryness of the mouth (17.74%) and bradycardia (22.58%) were the predominant side effects, with no observed hypotension in patients receiving lignocaine. It is noteworthy that all patients remained clinically stable, maintaining their mean arterial pressure above 60 and heart rate above fifty, eliminating the need for vasopressor support.

Limited studies are available on blood pressure stabilization after a decline due to dexmedetomidine and the optimal drug dose. In a study by Barkha B et al [19], bradycardia occurred in 42% of patients in the dexmedetomidine group, compared to 8% in the control group. However, no treatment was required for any of the patients. Furthermore, 8% of patients in the dexmedetomidine group experienced hypotension, while none of the patients in the placebo group developed hypotension.

CONCLUSION

In conclusion, it was found in our study that perioperative infusions of lidocaine and dexmedetomidine had similar effects on postoperative pain relief and a reduction in analgesic consumption. However, the postoperative recovery profile was notably superior with dexmedetomidine infusion. Consequently, the utilization of perioperative dexmedetomidine in laparoscopic cholecystectomy is recommended for enhanced postoperative pain relief, as it leads to reduced opioid consumption and facilitates early recovery.

The study, comprising 62 patients falling within ASA I and II categories, aged between 18 and 60 years, undergoing laparoscopic cholecystectomy surgeries,

revealed no statistically significant differences among the groups concerning demographic variables and surgery duration. Following intubation, an increase in systolic blood pressure and mean arterial pressure was observed in both groups, but the dexmedetomidine group exhibited a more attenuated pressor response compared to the lidocaine group, with statistically significant differences persisting up to 60 minutes post-intubation.

In the lidocaine group, the pulse rate consistently rose compared to the pre-intubation baseline values. In contrast, the dexmedetomidine group displayed an increased heart rate compared to baseline values, albeit the rise was significantly less than that observed in the lidocaine group. Side effects were more prevalent in the dexmedetomidine group than in the lidocaine group, while the pain score was lower in the lidocaine group compared to dexmedetomidine.

Ultimately, it was concluded in the study that dexmedetomidine is a superior drug compared to lidocaine in controlling the pressor response, and the most optimal time for administration, based on our findings, is approximately 10 minutes before intubation. Conversely, lidocaine outperforms dexmedetomidine in providing an extended pain-free period, better postoperative analgesia, and exhibits fewer side effects in patients undergoing laparoscopic cholecystectomy.

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