Effect of Low Dose Dexmedetomidine Infusion on Hemodynamics in Patients Undergoing Laparoscopic Cholecystectomy: A Prospective Observational Study

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ABSTRACT

Introduction: Dexmedetomidine is a relatively new potent and highly selective α_2-adrenoceptor agonist that has been used to provide sympatholysis, analgesia and sedation in the perioperative period. We conducted this study to evaluate the effects of dexmedetomidine on the haemodynamics of patients undergoing laparoscopic cholecystectomy.

Material and Methods: After obtaining approval from Hospital Ethics Committee, 60 patients undergoing laparoscopic cholecystectomy were enrolled for the study with their informed consent. They were divided into groups of thirty each. One group received propofol and dexmedetomidine during maintenance of anaesthesia while the other received only propofol. Haemodynamic parameters were noted and analysed.

Results: It was found that dexmedetomidine significantly reduces heart rate, systolic, diastolic and mean arterial blood pressure values as compared to when only propofol was used, and reduces requirement of propofol while maintaining stable haemodynamics.

Conclusion: Dexmedetomidine effectively attenuates haemodynamic stress response during laparoscopic cholecystectomy with reduction in requirement of concomitantly-administered propofol.

Keywords: Dexmedetomidine, Haemodynamic Stress Response, Laparoscopic Cholecystectomy

INTRODUCTION

In the current era, laparoscopic cholecystectomy is considered the gold standard of treatment for symptomatic cholelithiasis, given the benefits of better postoperative pain profiles, lesser surgical wound complications and reduced hospital stay.[1]

The anaesthesiologist however is still faced with the problems of stress response induced by anaesthesia and surgery. Instrumentation of the airway and creation of pneumoperitoneum are events that involve intense sympathetic stimulation and eventually give rise to increase in heart rate, blood pressure, systemic and pulmonary vascular resistance, and reduced cardiac output via increase in plasma nor-epinephrine, epinephrine levels and plasma renin activity.[2]

The reverse Trendelenburg position required for the surgical procedure has been shown to variably reduce cardiac index[3], but others found no change in cardiac index while at the same time concluding that the induction of anaesthesia had the most profound effect on the hemodynamic performance while insufflation had modest effect on cardiac function.[4]

The anaesthetic management hence has aimed at minimizing effects of sympathetic stimulation by incorporating opioids, benzodiazepines, beta adrenergic blockers and calcium channel blockers into the anaesthetic regimen. α2 adrenergic agonists are increasingly being used to reduce stress response to anaesthesia and surgery for their analgesic, anxiolytic, sedative and sympatholytic properties.

In December 1999, dexmedetomidine, a highly selective α2 agonist similar to clonidine but with a greater affinity for the α2 receptor, was approved for introduction into clinical practice as a short-term sedative (<24 hours).[5] α2 adrenergic agonists decrease sympathetic tone, attenuate neuroendocrine and hemodynamic responses to anaesthesia and surgery, reduce anaesthetic and opioid requirements and cause sedation and analgesia while allowing preservation of psychomotor function as the patient rests comfortably.[5] While clonidine has a specificity of 220:1 (α-2:α-1), dexmedetomidine exhibits a specificity of 1620:1.22. It is the pharmacologically active d-isomer of medetomidine, a full agonist of α2 adrenergic receptors.[6]

Thus, dexmedetomidine could be an important part of the armamentarium of the anaesthesiologist that can be used in the efforts to achieve good control of the haemodynamics of the patient undergoing laparoscopic surgery with pneumoperitoneum. We decided to study the haemodynamic effect of dexmedetomidine administered within the low dose range approved by the FDA in such patients.

MATERIAL AND METHODS

After Hospital Ethics Committee approval, we investigated 60 patients undergoing laparoscopic cholecystectomy. Patient identity was kept confidential. All data was collected anonymously.

Inclusion Criteria

1) Laparoscopic cholecystectomy.
2) Age Group 18-60 years.

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3) ASA I or II.
4) Weight 40 to 70 kg.
5) Any gender.

Exclusion Criteria:

1) History of allergy to dexmedetomidine or any of the drugs to be administered.
2) Cardiac disorders.
3) Current beta blocker / calcium channel blocker / digoxin therapy.
4) Hepatic, renal, haematologic, neuromuscular diseases.
5) ASA grade including and higher than III.
6) Pregnant or lactating female.
7) Patients with known history of substance abuse.
8) Patients with airway problems (anticipated / unanticipated difficult airway / obstructive sleep apnoea).

Sixty patients undergoing laparoscopic cholecystectomy were evaluated. Thirty patients undergoing surgery with dexmedetomidine and propofol infusion (*n* =30) [group A] versus thirty patients with only propofol infusion (*n=30*) [group B] were analysed. Patients with following conditions did not receive dexmedetomidine (only received propofol infusion and were assigned to group B): blood pressure fluctuations, arrhythmias, T wave inversion on ECG, headache, dizziness, neuralgia, neuritis, speech disorder, abdominal pain, diarrhoea, vomiting, hyperglycaemia, muscle weakness, syncope, hallucination, anxiety, depression, urinary retention, bronchospasm, pulmonary congestion, pulmonary hypertension, coughing, and increased sweating. The choice of anaesthesia medication used and the assignment of patients into group A or B was made by the chief anaesthesiologist in charge of the operation theatre based on his/her judgement and patient condition. Only those patients who underwent a simple laparoscopic cholecystectomy without duct exploration or other invasive procedures were included. Patients were excluded if there was any complication, or had to undergo a more invasive procedure, for example insertion of T-tube, or if procedure had to be converted to an open cholecystectomy. All patients received a standard general anaesthetic.

On the day of surgery

- Consent was confirmed.
- Fasting was confirmed.
- Standard anaesthesia trolley, airways and medication with documentation.
- In the OR, monitoring for non-invasive blood pressure, electrocardiogram, pulse oximetry, end tidal CO_2 was started. Baseline heart rate, SpO_2, systolic and diastolic blood pressure, mean arterial blood pressure were recorded.

Study procedure:

Group A: Dexmedetomidine infusion was started 10 minutes prior to intubation. The infusion was prepared by anaesthesiologist in a 50 ml syringe by adding 2ml of the drug solution (100 mcg/ml) to 48 ml 0.9% normal saline to reach a total volume of 50 ml and drug concentration of 4 mcg/ml. Infusion rate was kept at 0.5 mcg/kg/hour (0.125 ml/kg/hour).

Group B: Did not receive dexmedetomidine infusion. General anaesthesia was induced with intravenous propofol 2 mg/kg and vecuronium 0.1 mg/kg and endotracheal intubation performed. Anaesthesia was maintained with propofol infusion in both groups started at 4 mg/kg/hour immediately after intubation. The rate of propofol infusion was adjusted in the dose range of 4 to 6 mg/kg/hour in order to maintain hemodynamic parameters (heart rate, mean arterial pressure, systolic and diastolic BP) ± 20% of baseline. All surgical procedures were performed by an experienced surgeon. Propofol and dexmedetomidine infusions were continued till end of surgery and deflation of pneumoperitoneum. Heart rate, Blood pressure, and SpO_2 were monitored throughout surgery. Rescue medication were documented. If the dexmedetomidine infusion rate needed to be changed at any point of time, then such cases were excluded from the study. Neuromuscular blockade antagonism was achieved with neostigmine 0.05 mg/kg and glycopyrrolate 0.01 mg/kg and the patient extubated at the end of surgery. Patients with complications were excluded from the study.

Outcome measures

Heart rate, systolic BP. diastolic BP and mean arterial BP in group A and group B were measured and compared:

1. At baseline
2. One minute after induction
3. One minute after intubation
4. After pneumoperitoneum (at intervals of 15 minutes)
5. After deflation of pneumoperitoneum

Total volume of propofol used in both groups was compared.

STATISTICAL ANALYSIS

After collection of data, analysis was done with the help of statistical software package. Statistical analysis was done using both parametric and non parametric test. Quantitative data was presented with help of mean, standard deviation (SD) and median. Comparison among study groups was done with the help of Unpaired t test or Mann Whitney test and ANOVA test. Qualitative data between various parameters among study group was assessed by *chi* square test. *P* value < 0.05 was deemed significant.

RESULTS

Demographic data (age, sex, weight and ASA grading) of the patients were comparable in both the study group (*P*>0.05). Base line of hemodynamic data (HR, SBP, DBP and MAP) were comparable in both the group and statistically insignificant (*P*>0.05).

The baseline mean heart rate in beats/minute in both the groups was comparable prior to starting the study drugs. There was a significant fall in heart rate in group A after the starting of the infusion. The heart rate in group A was always significantly lower than that in group B (*P*<0.05) throughout the procedure (Table 1).

Baseline systolic blood pressure (mm hg) in group A (mean=123.27) and group B (mean=122.67) were comparable. There was statistical significance in systolic blood pressure readings at 15 min, 30 min, and 45 min ($P < 0.05$) after pneumoperitoneum. The systolic blood pressure in group A at 15 min (mean=124), 30 min (mean=124.8), 45 min (mean=123) were significantly lower than systolic blood pressure in group B at 15 min (mean=128.20), 30 min (mean=129.2) and 45 min (mean=128.6) ($P<0.05$) after pneumoperitoneum (Table 2).

Baseline diastolic blood pressure (mm Hg) in group A (mean=83.13) and group B (mean=83.07) were comparable. There was statistical significance in diastolic blood pressure readings at 30 min, 45 min, and 60 min after pneumoperitoneum ($P<0.05$). The diastolic blood pressure in group A at 30 min (mean=82.8), 45 min (mean=84.8),

Heart rate at	Group A				Group B				Unpaired t test applied		
	Mean	SD	Median	IQR	Mean	SD	Median	IQR	t-value	*P*-value	Difference is
Baseline	78.23	5.33	78.00	8.25	76.13	4.38	75.50	4.75	1.667	0.101	Not significant
1 min Induction	67.23	5.51	66.00	10.00	72.87	3.55	72.00	5.25	-3.856	0.00012	Significant
1 min Intubation	73.87	5.51	73.00	9.00	86.67	4.50	87.00	6.50	-9.860	5.22E-14	Significant
15 min	73.33	5.92	74.00	8.00	88.47	5.89	88.00	10.00	-9.926	4.08E-14	Significant
30 min	71.40	5.07	71.00	8.00	88.53	5.80	89.00	8.50	-12.183	1.25E-17	Significant
45 min	72.03	4.80	72.00	4.25	88.73	5.52	90.00	8.00	-12.508	4.12E-18	Significant
60 min	73.40	5.09	73.00	6.50	88.33	4.24	88.00	8.00	-12.351	7.05E-18	Significant
Deflation	69.27	5.15	68.00	6.00	87.30	4.15	88.00	6.50	-14.936	1.55E-21	Significant

Table-1: Comparison of heart rate at various intervals between group A and group B

Systolic BP at-	Group A				Group B				Unpaired t test applied		
	Mean	SD	Median	IQR	Mean	SD	Median	IQR	t-value	*P*-value	Difference is-
Baseline	123.27	10.25	122.00	16.00	122.67	9.76	123.00	18.50	0.232	0.817	Not significant
1 min Induction	108.10	7.74	106.00	10.00	111.20	9.89	113.00	16.50	-1.352	0.182	Not significant
1 min Intubation	122.13	9.40	119.00	16.50	126.57	10.97	130.00	16.50	-1.795	0.073	Not significant
15 minutes	124.00	8.24	122.00	12.00	128.20	9.16	130.00	11.00	-2.003	0.04518	Significant
30 minutes	124.80	5.82	126.00	10.50	129.20	7.40	130.00	12.00	-2.560	0.01309	Significant
45 minutes	123.00	5.40	122.00	8.50	128.60	5.73	130.00	6.50	-3.894	0.00026	Significant
60 minutes	125.93	5.77	126.00	8.00	127.73	6.49	128.00	10.00	-1.136	0.261	Not significant
Deflation	112.27	5.48	110.00	8.00	110.73	6.42	110.00	10.50	0.995	0.324	Not significant
Data failed 'normality' test. Hence Mann-Whitney test applied. t value replaced by z value.											

Table-2: Comparison of systolic blood pressure at various time intervals between group A and group B

Diastolic BP at	Group A				Group B				Unpaired t test applied		
	Mean	SD	Median	IQR	Mean	SD	Median	IQR	t-value	*P*-value	Difference is
Baseline	83.13	6.53	84.00	11.00	83.07	5.60	83.00	10.00	0.042	0.966	Not significant
1 min Induction	72.07	6.14	72.00	8.50	70.87	6.64	70.00	8.50	0.727	0.470	Not significant
1 min Intubation	83.67	6.15	84.00	8.50	83.27	5.74	84.00	10.50	0.260	0.795	Not significant
15 minutes	84.40	7.62	86.00	11.00	88.20	7.83	88.00	12.00	-1.905	0.062	Not significant
30 minutes	82.80	6.49	83.00	10.00	91.73	6.45	92.00	7.00	-5.349	1.57E-06	Significant
45 minutes	84.80	7.49	86.00	12.00	91.07	5.58	92.00	10.00	-3.674	0.00052	Significant
60 minutes	86.80	6.90	88.00	12.50	92.33	6.60	92.00	10.00	-3.173	0.00241	Significant
Deflation	78.07	6.84	78.00	9.00	80.80	6.90	80.00	10.00	-1.541	0.129	Not significant
Data failed 'normality' test. Hence Mann-Whitney test applied. t value replaced by z value.											

Table-3: Comparison of diastolic blood pressure at various time intervals between group A and group B

Mean arterial BP at	Group A				Group B				Unpaired t test applied		
	Mean	SD	Median	IQR	Mean	SD	Median	IQR	t-value	*P*-value	Difference is
Baseline	96.51	7.12	95.33	9.50	96.27	5.12	95.33	7.50	0.153	0.879	Not significant
1 min Induction	84.08	5.49	83.00	8.83	84.31	5.73	82.67	6.67	0.000	1.000	Not significant
1 min Intubation	97.11	5.33	97.00	7.33	98.24	4.39	98.33	7.17	-0.899	0.373	Not significant
15 minutes	97.60	5.98	97.00	9.33	101.53	6.01	102.00	8.33	-2.541	0.01374	Significant
30 minutes	96.80	4.83	97.00	5.50	104.22	4.25	104.00	4.83	-6.320	4.02E-08	Significant
45 minutes	97.53	5.45	97.33	9.00	103.58	3.98	104.33	6.33	-4.908	7.84E-06	Significant
60 minutes	99.84	5.04	100.67	8.50	104.13	4.03	104.67	5.50	-3.641	0.00058	Significant
Deflation	89.47	5.24	88.00	8.17	90.78	5.17	90.33	5.00	-0.976	0.333	Not significant
Data failed 'normality' test. Hence Mann-Whitney test applied. t value replaced by z value.											

Table-4: Comparison of mean arterial blood pressure at various time intervals between group A and group B and 60 min (mean=86.8) were significantly lower ($P<0.05$) than diastolic blood pressure in group B at 30 min (mean=91.73), 45 min (mean=91.07), and 60 min(mean=92.33) after pneumoperitoneum (Table 3).

Baseline mean arterial pressure (mm hg) in group A (mean=96.51) and group B (mean=95.33) were comparable. The mean arterial pressure in group A at 15 min (mean=97.6) 30 min (mean=96.8), 45 min (mean=97.53), and 60 min (mean=99.84) were significantly lower ($P<0.05$) than mean arterial pressure in group B at 15 min (mean= 101.53) 30 min (mean=104.22) and 45 min (mean=103.58), and 60 min (mean=104.13) after pneumoperitoneum (Table 4).

DISCUSSION

Laparoscopic surgeries with CO_2 pneumoperitoneum are done with the intention of reducing trauma, morbidity, mortality, pain and stress response to surgery, hospital stay and health care costs. In laparoscopic surgery with pneumoperitoneum, hemodynamic changes can obscure the operative area, jeopardize success of surgery, lead to complications, resulting in increased postoperative hospital stay and cost. Various physiological methods and pharmacological agents have been used for controlling haemodynamics in laparoscopic surgery with varying success. Dexmedetomidine, a relatively new α_2 agonist, provides dose dependent sedation, analgesia, sympatholysis, anxiolysis and controlled hypotension without relevant respiratory depression. Dexmedetomidine has also been found to be effective in attenuating pressor response to intubation and pneumoperitoneum. We decided to study if this agent would be effective in providing stable haemodynamics in laparoscopic surgery. The present study was carried out in 60 ASA grade I and II patients aged 18-60 years undergoing laparoscopic cholecystectomy with CO_2 pneumoperitoneum. These patients were divided into two groups of 30 each. Group A (dexmedetomidine and propofol) received infusion of dexmedetomidine at the rate of 0.5 mcg/kg/hour started 10 minutes prior to intubation. Group B (Propofol) patients did not receive dexmedetomidine infusion. Both groups received propofol infusion in the dose range of 4-6 mg/kg/hour to maintain hemodynamic parameters (heart rate, MAP, systolic and diastolic BP) ± 20% of baseline.

Demography

Both the groups were comparable demographically in terms of sex, ASA grade, age and weight, surgical procedure to be performed and baseline hemodynamic parameters. There was no difference in the average pneumoperitoneum time, group A (Mean: 68.87 ± 3.53 minutes) vs group B (Mean: 69 ± 3.25minutes) with a p value of 1.00 which was not statistically significant.

Effect on heart rate

The baseline heart rate in group A (dexmedetomidine + propofol) showed a significant fall from baseline value once dexmedetomidine infusion was started. The mean baseline heart rate in group A was 78.23 ± 5.33.

There was a statistically significant ($p<0.05$) falling trend in the heart rate after starting the dexmedetomidine infusion. The lowest heart rate recorded in group A was 1 minute after induction (Mean = 67.23 ± 5.51).

The mean baseline heart rate in group B (Propofol) was 76.13 ± 4.38. There was a decrease in heart rate at 1 minute after induction (mean= 72.87 ± 3.55) which was statistically insignificant. Thereafter there was a rising trend in heart rate throughout the pneumoperitoneum, the highest heart rate was recorded at around 45 minutes after pneumoperitoneum (mean = 88.73 ± 5.52). All these changes in heart rate were statistically significant ($p<0.05$).

We compared the reduction in heart rate in both groups and found that dexmedetomidine was effective in reducing the heart rate. The mean heart rate in both the groups was also comparable at baseline but thereafter the heart rate values were significantly lower($p<0.05$) in group A compared to those in group B.

These findings are also consistent with those of Hassan S Bakhamees, Yasser M El-Halafawy, Halam El-Kerdawy, Nevein M Gouda and Sultan Altemyatt who studied effects of dexmedetomidine on morbidly obese patients undergoing laparoscopic bariatric surgery - they also found a decrease in heart rate values in the dexmedetomidine group[7].

Dhurjoti Bhattacharjee, Sushil Nayek, Satrajit Dawn, Gargi Bandopadhyay, Krishna Gupta, observed that heart rate decreased significantly after induction and during pneumoperitoneum in the dexmedetomidine group in laparoscopic cholecystectomy patients. The heart rate values were lower than the group of patients in which only propofol was used[8]. This is consistent with our findings.

Effect on Systolic Blood Pressure (SBP)

In group A mean baseline systolic BP (mm

Variables	Group A				Group B				Unpaired t test applied		
	Mean	SD	Median	IQR	Mean	SD	Median	IQR	t-value	*P*-value	Difference is
Pneumoperitoneum Time (min) ^	68.87	3.53	70.00	6.00	69.00	3.25	70.00	6.00	0.000	1.000	Not significant
Propofol dose (mg)	366.00	27.43	365.00	37.50	453.67	36.72	455.00	57.50	-10.477	5.37E-15	Significant
Propofol dose per hour (mg/kg)	4.31	0.19	4.28	0.34	5.57	0.24	5.58	0.43	-22.873	1.04E-30	Significant

Data failed 'normality' test. Hence Mann-Whitney test applied. t value replaced by z value.

Table-5: Comparison of dose and time variables between Group A and Group B hg) was 123.27 ± 10.25 which was comparable with mean baseline BP in group B (122.67 ± 9.67). After starting dexmedetomidine infusion in group A, the systolic BP did not show any statistically significant difference compared to baseline throughout pneumoperitoneum. However the systolic BP showed significant decrease at 1 minute after induction (108.10 ± 7.74) and at deflation of pneumoperitoneum (112.27 ± 5.48) ($p<0.05$). In group B, there was increasing trend in systolic BP throughout pneumoperitoneum, the highest reading being at 30 minutes of pneumoperitoneum (129.20 ± 7.40) which was statistically significant($p<0.05$). There was a statistically significant ($p<0.05$) decrease in systolic BP at 1 minute post induction (111.20 ± 9.89) and after deflation of pneumoperitoneum (110.73 ± 6.42). Systolic BP in group A at 15, 30, and 45 minutes after pneumoperitoneum was significantly lower ($p<0.05$) than that in group B.

These findings are supported by Poonam Ghodki, Shalini Thombre, Shalini Sardesai, Kalpana Harnagle who studied effects of dexmedetomidine as an adjuvant in laparoscopic surgery using entropy monitoring. They also found a reduction in systolic BP in dexmedetomidine group.[9]

Effect on Diastolic Blood Pressure (DBP)

In group A baseline mean diastolic BP (mm Hg) was 83.13 ± 6.53 which was comparable to mean baseline diastolic BP in group B (83.07 ± 5.6).

After starting dexmedetomidine infusion in group A, the diastolic BP did not show any statistically significant difference compared to baseline throughout pneumoperitoneum. However the diastolic BP showed significant decrease ($p<0.05$)at 1 minute after induction (72.07 ± 6.14) and at deflation of pneumoperitoneum (78.07 ± 6.84).

In group B, there was increasing trend in diastolic BP throughout pneumoperitoneum, the highest reading being at 60 minutes of pneumoperitoneum (92.33 ± 6.6) which was statistically significant($p<0.05$). There was a statistically significant ($p<0.05$) decrease in diastolic BP at 1 minute post induction (70.87 ± 6.64). Diastolic BP in group A at 30, 45, and 60 minutes after pneumoperitoneum was significantly lower ($p<0.05$) than that in group B.

These findings are supported by Poonam Ghodki, Shalini Thombre, Shalini Sardesai, Kalpana Harnagle who studied effects of dexmedetomidine as an adjuvant in laparoscopic surgery using entropy monitoring. They also found a reduction in diastolic BP in dexmedetomidine group.[9]

Effect on Mean Arterial Pressure (MAP)

In group A, the baseline MAP (mm hg) was (Mean=96.51 ± 7.12) versus mean baseline MAP (Mean = 96.27 ± 5.12) which was comparable. In group A, MAP was significantly decreased ($p<0.05$) 1 minute after induction (mean = 84.08 ± 5.49) and after deflation of pneumoperitoneum (mean = 89.47 ± 5.24). MAP value was significantly increased ($p<0.05$) 60 minutes after pneumoperitoneum (mean = 99.84 ± 5.04). Otherwise there was no statistical significance in MAP readings compared with baseline throughout the procedure. In group B, MAP was significantly decreased ($p<0.05$) 1 minute after induction (mean = 84.31 ± 5.73) and after deflation of pneumoperitoneum (mean = 90.78 ± 5.17). Rest of the MAP readings showed a significant rising trend, highest MAP being at 30 minutes after pneumoperitoneum (mean = 104.22 ± 4.25).

Dexmedetomidine maintained significantly lower ($p<0.05$) MAP values compared to group B during pneumoperitoneum.

Dhurjoti Bhattacharjee, Sushil Nayek, Satrajit Dawn, Gargi Bandopadhyay, Krishna Gupta, observed that MAP decreased significantly during pneumoperitoneum in the dexmedetomidine group in laparoscopic cholecystectomy patients. The MAP was lower than the group of patients in which only propofol was used. This is consistent with our findings.[8] These findings are also consistent with Hassan S Bakhamees, Yasser M El-Halafawy, Halam El-Kerdawy, Nevein M Gouda and Sultan Altemyatt who studied effects of dexmedetomidine on morbidly obese patients undergoing laparoscopic bariatric surgery. Arterial pressures were lower in dexmedetomidine group.[7]

Requirement of propofol

The total mean dose of propofol in Group A (dexmedetomidine + propofol) was 366 ± 27.43 mg versus in Group B (propofol) 453.67 ±36.72 mg (Figure 1). This was statistically significant ($p<0.05$). The mean average dosage of propofol required was 4.31 ± 0.19 mg kg^{-1} hr^{-1} in Group A, while it was 5.57 ± 0.24 mg $kg^{-1}hr^{-1}$ in Group B (Figure 2). This was statistically significant ($p<0.05$). Thus dexmedetomidine reduced the requirement of propofol. This observation is supported by Poonam Ghodki, Shalini Thombre, Shalini Sardesai, Kalpana Harnagle who studied effects of dexmedetomidine as an adjuvant in laparoscopic surgery using entropy monitoring. They also found a reduction in propofol dose in dexmedetomidine group.[9]

These findings are also consistent with Hassan S Bakhamees, Yasser M El-Halafawy, Halam El-Kerdawy, Nevein M Gouda and Sultan Altemyatt who studied effects of dexmedetomidine on morbidly obese patients undergoing laparoscopic bariatric surgery. They also found a decrease in propofol dose requirement in the dexmedetomidine group.[7]

Our study demonstrates the efficacy of dexmedetomidine in controlling haemodynamics of patients undergoing

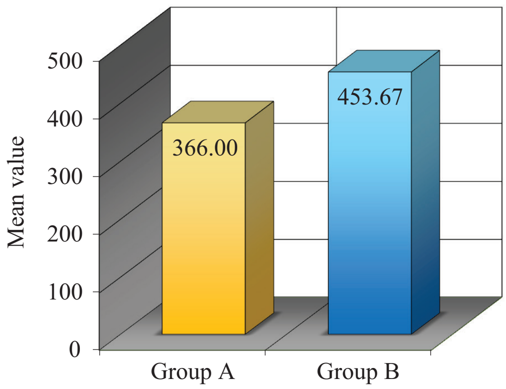

Figure-1: Propofol dose (mg) in Group A and Group B

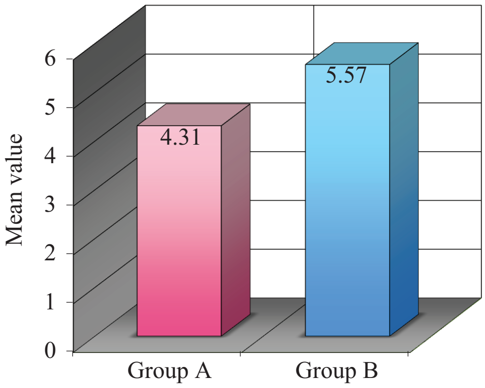

Figure-2: Propofol dose per hour (mg/kg) in Group A and Group B

laparoscopic cholecystectomy and thus reducing requirement of propofol. Heart rate was decreased more in group A than in group B. Systolic blood pressure, diastolic blood pressure, mean arterial pressure was successfully reduced to a greater extent when dexmedetomidine was used than when not used. Propofol dose required per hour was lesser in dexmedetomidine-propofol group than in propofol-only group.

CONCLUSION

These results suggest that low dose dexmedetomidine successfully maintained hemodynamic stability, with reduced requirements of propofol but without dexmedetomidine infusion higher doses of propofol were required to maintain hemodynamic stability.

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