e-ISSN: 0975-1556, p-ISSN:2820-2643

Available online on www.ijpcr.com

International Journal of Pharmaceutical and Clinical Research 2023; 15(1); 1090-1100

Original Research Article

Effects of Low Dose Dexmedetomidine Infusion on Haemodynamic Stress Response in Patients undergoing Laparoscopic Surgery

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Received: 29-11-2022 / Revised: 30-12-2022 / Accepted: 10-01-2023

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Conflict of interest: Nil

Abstract

Background and Aim: Dexmedetomidine attenuates stress response by blocking efferent sympathetic pathway, reduce peripheral sympathetic discharge, provide sedation, and support rapid recovery of patient. The purpose of our study was to evaluate the effects of low dose Dexmedetomidine infusion on haemodynamic stress response to critical incidences in patients undergoing laparoscopic surgery.

Material and Methods: Present Observational study was conducted for period of sixteen months after approval from institutional ethical committee. A total of 64 patients were included in the study and divided into two groups.

Group A: Inj. Dexmedetomidine 0.4 mcg /kg/hr in 50ml normal saline i.v infusion 15 min before induction of anaesthesia.

Group B: Inj. Normal saline 0.9% 50 ml i.v infusion 15 min before induction of anaesthesia. Level of sedation in post-operative period was assessed by Ramsay Sedation Assessment Scale and Post-operative pain assessment was done by Visual analog scale (VAS).

Results: After 1 min after laryngoscopy and intubation, the mean pulse rate increased above the pre infusion level in group A. Though this increase was less compared to increase in group B (P< 0.001). While comparing mean heart rate post-operatively between the two groups; initially after 1 min of post-operative period, Heart rate was lesser in group A 84.62±73.39 per min compared to Group B 102.09±6.56 per min (P<0.001). After events like endotracheal intubation and extubation, the mean SBP was still lower side in group A whereas increased in group B (P<0.001). Throughout intra-operatively, mean DBP was noted significantly lower in group A compared to group B despite of events like endotracheal intubation, pneumoperitoneum, and extubation (P<0.001). Postoperatively, from 1 min to 120 min both group were showing highly significant difference (p value≤0.001) regarding VAS score. So the total duration of analgesia was longer in group A as compared to group B.

Conclusion: Low dose Dexmedetomidine infusion surely attenuates sympathoadrenal response and provides better haemodynamic stability in critical incidences like laryngoscopy, endotracheal intubation and pneumoperitoneum in patients undergoing laparoscopic surgeries as compared to group NS(normal saline).

Keywords: Dexmedetomidine, Haemodynamic Stress Response, Normal saline, Laryngoscopy.

Introduction

Development of laparoscopic surgery has been so impressive in the last decade. It is difficult to credit one individual with the pioneering of the laparoscopic approach. In 1901 Georg Kelling of Dresden, Germany performed the first laparoscopic procedure in dogs and in 1910 Hans Christian Jacobaeusof Sweden performed the first diagnostic laparoscopic surgery in humans. Laparoscopic approach was well practiced in early 1970's as a diagnostic procedure. In the ensuing several decades, numerous individuals refined and popularized the approach further for laparoscopy and the first laparoscopic surgery was performed in late 1980's. Since then laparoscopy has been expanded in both scope and volume [1,2].

Laparoscopic surgery has gained popularity due to its well- known advantages over open surgical procedures. They are less invasive so less post-operative pain, shorter hospitalization, faster functional recovery. It has less chances of nosocomial infections & ultimately it reduces hospital cost. Thus laparoscopic surgery is also termed as patient friendly surgery [3,4].

However, like any other surgery laparoscopic surgery is also associated with stress response induced by anaesthesia and surgery due to insufflation of CO_2 into peritoneal cavity and intraoperative postural changes [5-8].

Anaesthetic maneuvers like direct laryngoscopy, endotracheal intubation and extubation involve sympathetic stimulation. Moreover, the pneumoperitoneum and carbon dioxide insufflations required in laparoscopic surgeries also leads to increase in plasma epinephrine, nor-epinephrine levels and plasma renin activity. All these changes lead to increase in heart rate (HR), mean arterial pressure (MAP), systemic vascular resistance (SVR) and pulmonary vascular resistance (PVR) and thus reduces cardiac output (CO) [9,10].

The reverse trendelenburg position required in laparoscopic surgery leads to diminished venous return and further decrease in cardiac output (CO). These haemodynamic changes predispose the myocardium to ischemia that may be life threatening in a vulnerable patient. The origin of pain post laparoscopic surgery is multifactorial that includes pain arising from incision sites, from operated area and also shoulder painas a consequence of pneumoperitoneum [11].

In modern anesthesia practices, there are several techniques and agents were tried to prevent sympathetic changes and provide haemodynamic stability perioperatively. E.g. TIVA, NSAIDS, opioid analgesics, benzodiazepines, beta blockers, vasodilators and calcium channel blockers have been used to achieve these objectives with variable success. Though opioids are found effective, but they have more side effects. NSAIDS alone are found to be insufficient to provide adequate analgesia [12,13].

Dexmedetomidine is a selective alpha-2 agonist, block the norepinephrine release. Moreover it attenuates stress response by blocking efferent sympathetic pathway, reduce peripheral sympathetic discharge, provide sympathoadrenal stability, suppress renin angiotensin activity, reduce intraoperative anaesthetic requirement, reduce postoperative pain, provide sedation, reduce requirement of postoperative analgesia and support rapid recovery of patient [14].

The purpose of our study was to evaluate the effects of low dose Dexmedetomidine infusion on haemodynamic stress response to critical incidences like laryngoscopy, endotracheal intubation, creation of pneumoperitoneum and extubation, intraoperative hemodynamic stability, postoperative sedation and analgesic requirement in patients undergoing laparoscopic surgery.

Material and Methods

Present Observational study was conducted for period of sixteen months after approval from institutional ethical committee, written informed consent from all patients Sample size was calculated by using open EPI software, considering the pulse rate 1 minute after induction from previous study of inj. Dexmedetomidine infusion. Pulse rate by using placebo compared to intravenous Dexmedetomidine are 86.5 ± 3.8 and 80.55 ± 9.05 respectively.

Patient was randomly allocated in one of the two groups.

Group A: Inj. Dexmedetomidine 0.4mcg /kg/hr in 50ml normal saline i.v infusion 15 min before induction of anaesthesia.

Group B: Inj. Normal saline 0.9% 50ml i.v infusion 15 min before induction of anaesthesia

A total of 64 patients were included in the study and divided into two groups as follows: group 1(n1) = 32 and group 2(n2) = 32

Following criteria was considered in this study

Inclusion Criteria:

1. Physical status: ASA (American society of anesthesiologist) grade I & II,
2. Sex: Male- Female
3. Age: Between 18 to 60 years of age
4. Type of surgery: Laparoscopic Surgeryunder general anesthesia.
5. Type of anaesthesia: General anaesthesia

Exclusion criteria:

1. Patient's refusal
2. History of allergic reaction to any drug used in the study
3. Patient with communication difficulties
4. Not NBM (nil by mouth) for 6 Hours before surgery.
5. Patient who have bronchial asthma, chronic obstructive pulmonary disease, diabetes
6. mellitus, hypertension, ischemic heart disease

Informed written consent was obtained from the selected patients included in the study. Data collection was done by using pre prepared proforma to enter the patient details, detailed clinical history including presenting complains, past history, family history, physical and systemic examination who meet the inclusion criteria.

Investigation

CBC, RFT, Serum Electrolytes, RBS, ECG, Chest x-ray

After taking patient into operation theatre, premedication was given by intravenous route as following:

1. Inj. Glycopyrrolate: 0.01 mg / kg
2. Inj. Ondensatron: 0.1 – 0.2 mg / kg
3. Inj. Fentanyl: 1.0 mcg / kg

After giving premedication, drug infusion was started. After 15 min of starting infusion, pre-oxygenation was performed for 3 min. Patients was induced with inj. propofol 2mg/kg intravenously followed by inj. succinylcholine 1.5mg/kg intravenously. Trachea was intubated with appropriate size cuffed endotracheal tube. Anaesthesia was maintained with O_2:N_2O (50:50), isoflurane and injection vecuronium as a muscle relaxant. Intra-abdominal pressure was maintained between 12 to 14 mmHg throughout the laparoscopic procedure. The patients were mechanically ventilated using circle system to keep the $EtCO_2$ between 25- and 45-mm Hg.

Drug infusion was stopped 15 min before the end of surgery. Reversal was carried out as also extubation by conventional methods.

Post-operative level of sedation:

Level of sedation in post-operative period was assessed by

Ramsay Sedation Assessment Scale:

Awake Levels Patient anxious or agitated or both 1

Patient cooperative, oriented and tranquil 2

Patient responds to commands only 3

Asleep Levels A brisk response to a light glabellar tap 4

A sluggish response to a light glabellar tap 5

No response 6

Post-operative pain assessment:

Visual analog scale (VAS)

Visual analog scale (0-10) was used for post-operative pain assessment. If dose VAS score 4 / >4, the patient was received a rescue of analgesic in the form of inj. Diclofenac sodium 1.5 mg/kg IM

For Statistical analysis, the results were tabulated and analyzed using SPSS (Statistical Package for Social Sciences) Software. Chi-square test was used for qualitative data and compared within the group against baseline values.

Results

A total of 120 patients posted for various elective surgical procedures under general anaesthesia were screened for inclusion in the study during the period. Out of these 56 patients who did not meet the inclusion criteria were excluded. Remaining 64 patients were randomized into Group A and Group B.

There were total 64 participants included in the study. Randomly 32 participants included in each group with proper blinding. In study group A we have given injection Dexamedetomidine and in Group B injection Normal saline was given. Rest medications were kept same in both the group as per requirements.

There were 87.5%(n=28) males and 12.5%(n=4) female participants in the study. There were 87.5%(n=28) males and 12.5%(n=4) female participants in the study. Male: Female ratio is 4:1 in group B. Mean age of participant in group A was 38.18±9.94years. Minimum age of participant was 19 years and maximum age was 54 years in this group. Mean age of participant in group B was 40.53±10.15years. Minimum age of participant was 20 years and maximum age was 54 years in this group.

Mean duration of surgery of participant in group A was 127.96±49.49 min. Minimum duration of surgery of participant 60 min and maximum duration of surgery was 260 min in this group. Mean duration of surgery of participant in group B was 116.87±35.896 min. Both groups under study were comparable to each other with respect to age, sex, weight, ASA grading and duration of surgery and anesthesia. The difference in mean age, mean weight, sex ratio, ASA grading, duration of anesthesia and duration of surgery between two group were found to be statistically insignificant (p>0.05).

Laparoscopy surgeries are widely used in surgical hernioplasty. Here in group A 37.5% of patients underwent B/L lap TAPP, 15.6% of operated for right side lap TAPP, 21.8% of for left side lap TAPP and 9.4% of for lap IPOM. In group B there were 28.12% of patients operated for B/L lap TAPP, 21.87% and 6.25% of for right and left side lap TAPP respectively and 6.25% of for lap IPOM. 9.4% and 25% of patients underwent lap appendisectomy in group A and B respectively. In gynecological procedures, 6.25% and 9.37% of patients operated for total lap hysterectomy in group A and B respectively. As well as 3.12% of patient underwent diagnostic laparoscopy in group B.

Baseline systolic blood pressure in Group A was 126.28±5.84 mm of Hg and Group B was 125.37±5.66 mm of Hg which was comparable and statistically not significant (p>0.05). Baseline diastolic blood pressure in Group A was 80.06±3.67mm of Hg and Group B was 81.18±3.38 mm of Hg which was comparable and statistically not significant (p>0.05). Baseline Mean blood pressure in Group A was 95.46±2.95 mm of Hg and Group B was 95.91±2.98 mm of Hg which was comparable and statistically not significant (p>0.05). Thus, there is no significant difference found in pre-operative vitals in both the groups.

In the Group A (dexmedetomidine group), after starting the infusion, the mean pulse rate decreased significantly below the pre infusion level. After 1 min after laryngoscopy and intubation, the mean pulse rate increased above the pre infusion level in group A. Though this increase was less compared to increase in group B (P < 0.05). Pneumoperitoneum did not produce tachycardia in Group A. (P<0.05)

In group B (NS group), after starting the infusion there was no significant change in mean pulse rate but after intubation these increased highly significantly above pre infusion level (P<0.05). Also after extubation and after pneumoperitoneum mean pulse rate increased significantly (P<0.05).

In group A, Before starting infusion mean heart rate was 84.53±7.55 per minute and in group B it was 87.03±7.19 per minute. It was statistically insignificant (P>0.05). 15 min after starting infusion mean heart rate decreased in group A(80.65±6.69 per minute) but it increased in group B(88.00±6.96 per minute), noted significant statistically (P<.001).At the time of laryngoscopy and endotracheal intubation mean heart rate were increased in group A(81.65±6.63 and 86.5±6.42 respectively) but rise was highly significant in group B(91.09±6.85 and 96.59±7.13 respectively) and P value is <0.001.

Also after 5 min. of pneumoperitoneum, in group A mean heart rate was settled (75.09±6.43 per minute), but in group B it was on still higher side (91.18±7.28 per minute), found highly significant statistically (P<0.001)

At last after extubation, mean heart rate in group A was slightly increased (83.71±7.19 per minute) but very minimal rise found compared to group B (98.92±6.58 per minute), that is also statistically highly significant (P<0.001).

In the Group A, after starting the infusion, the mean SBP decreased below the pre infusion level. After events like endotracheal intubation and extubation, the mean SBP was still lower than pre infusion level (P < 0.05). Pneumoperitoneum did not produce rise in SBP of Group A patients (P<0.05).

While, in the Group B, after starting the infusion, the mean SBP increased above the pre infusion level. After events like endotracheal intubation and extubation, the mean SBP was noted higher than pre infusion level (P < 0.05). Pneumoperitoneum also produced rise in SBP of Group B patients (P<0.05).

Before starting infusion mean systolic blood pressure in group A was 126.28±5.84 mm of Hg and in group B it was 125.37±5.66 mm of Hg. It was statistically insignificant(P>0.05).

15 min after starting infusion mean systolic blood pressure decreased in group A(120.18±5.58mm of Hg) but it increased in group B(128.40±5.74mm of Hg), noted significant statistically (P<.001).

At the time of laryngoscopy and endotracheal intubation mean systolic blood pressure was increased in group A(115.93±5.75 and 117.90±5.93 mm of Hg respectively) but rise was highly significant in group B (132.81±5.69 and 138.28±5.30 mm of Hg respectively) and P value is <0.001.

After 1 min. of pneumoperitoneum, in group Amean systolic blood pressure was settled (113.81±5.74mm of Hg) but in group B it was on still higher side (136.19±5.30 mm of Hg), found highly significant statistically (P<0.001).

Also 5 min after release of pneumoperitoneum, in group A mean systolic blood pressure was 108.16±6.91 mm of Hg, but in group B it was 126.97±5.98 mm of Hg that suggestive of highly significance (P<0.001)

At last 1 min after extubation, mean systolic blood pressure in group A was slightly increased (117.96±6.71mm of Hg) but very minimal rise found compared to group B (135.03±6.05 mm of Hg), that is also statistically highly significant (P<0.001).

Thus intra-operative mean SBP was significantly lower in group A compared to group B despite of events like laryngoscopy, endotracheal intubation, pneumoperitoneum and extubation.

In the Group A, after starting the infusion, the mean DBP decreased below the pre infusion level. Pneumoperitoneum did not produce rise in DBP of Group A patients. (P<0.05). Increased diastolic blood pressure noted with laryngoscopy and endotracheal intubation compared to pre infusion level (P>0.05).In the Group B while comparing before starting infusion, after endotracheal intubation and pneumoperitoneum, and extubation the mean DBP was increased (P < 0.05).

Before starting infusion mean diastolic blood pressure in group A was 80.06 ±3.67 mm of Hg and in group B it was 81.18±3.38 mm of Hg. It was statistically insignificant (P>0.05).15 min after starting infusion mean diastolic blood pressure decreased in group A(72.12±3.88 mm of Hg) but it showed no much difference in group B(80.40±3.32mm of Hg), noted significant statistically (P<.001).

At the time of laryngoscopy and endotracheal intubation mean diastolic blood pressure was still at lower side in group A(70.21±4.12 and 73.15±4.17 mm of Hg respectively) but rise was highly significant in group B (86.84±3.87 and 90.00±3.94 mm of Hg respectively) and P value is <0.001.

After 15 min. of pneumoperitoneum, in group A mean DBP was settled (75.12±4.76 mm of Hg), but in group B it was on still increased (85.90±5.56mm of Hg), found highly significant statistically (P<0.001). Also 1 min after release of pneumoperitoneum, in group A mean diastolic blood pressure was 69.18±4.78 mm of Hg, but in group B it was 74.52±5.45 mm of Hg that suggest higher significance (P<0.001)

At last 1 min after extubation, mean diastolic blood pressure in group A was increased (78.15±5.04mm of Hg) but compared to group B (88.34±5.59 mm of Hg), that is also found statistically highly significant (P<0.001). Thus intraoperative mean DBP was noted significantly lower in group A compared to group B.

Mean Arterial Pressure(MAP) in group A remained below pre-infusion level after intubation, pneumoperitoneum and after extubation. Found significant statistically (P<0.05).

While in group B, after starting the infusion there was no significant change in Mean Arterial Pressure(MAP) but these increased highly significantly above pre-infusion level after intubation and extubation and significantly increased after pneumoperitoneum (P<0.05).

Before starting infusion mean blood pressure in group A was 95.46±2.95 mm of Hg and in group B it was 95.91±2.98 mm of Hg. It was statistically insignificant(P>0.05). 15 min after starting infusion mean blood pressure decreased in group A (88.14±2.93mm of Hg) but it increased in group B (96.40±3.08 mm of Hg), noted significant statistically (P<0.001).

At the time of laryngoscopy and endotracheal intubation mean blood pressure was still at lower side in group A(85.45±3.30and 88.07±3.40 mm of Hg respectively) but rise was highly significant in group B (102.16±2.94 and 106.09±2.78 mm of Hg respectively) and P value is <0.001.

After 1 min. of pneumoperitoneum, in group A mean blood pressure was quite settled (89.20±3.81 mm of Hg), but in group B it was on still increasing (108.83±3.89mm of Hg), found highly significant statistically (P<0.001).

At last 1 min after extubation, mean blood pressure in group A was 91.42±3.89 mm of Hg but in group B it was still on higher side (103.90±4.21 mm of Hg), that is also found statistically highly significant (P<0.001).

Thus intraoperative mean blood pressure was significantly lower in group A compared to group B.

While comparing mean heart rates between the two groups; initially after 1 min of post-operative period, Heart rate was lesser in group A (84.62±73.39) compared to Group B (102.09±6.56). It shows highly significant statistical difference. P≤0.001)

At 5min Heart rate was 81.00±7.69 in group A and 99.18±6.90 in group B. At 15min Heart rate was 77.15±7.67 in group A and 96.81±6.17 in group B. At 30 min Heart rate was 75.37±8.01 in group A and 90.93±6.12in group B. As shown in above table, at 5min,15 min and 30 min both group showing highly significant difference. (P≤0.001).

At 60 min Heart rate was 79.39±8.32in group A and 82.84±6.02 in group B. At 120 min Heart rate 87.46±8.19 in group A and 87.15±6.04in group B. At 60 min and 120 min there is no significant difference found in post-operative heart rate of both the groups (P ≥0.05)

Table 1: Comparison of post-operative Visual analogue scale (VAS) at various interval between Group A and Group B

Duration	Group A	Group B	P value
1 min	0.56±0.55	1.93±0.71	≤0.001
5 min	1.45±0.5	2.78±0.65	≤0.001
15 min	2.28±0.63	4.18±0.69	≤0.001
30 min	2.21±0.65	5.25±0.67	≤0.001
60 min	3.31±0.53	5.43±0.50	≤0.001
120 min	4.43±0.51	6.25±0.43	≤0.001

Postoperatively, all the patients were assessed for pain by 10-point visual analogue scale. 1 min after post-operative period, Visual analogue scale (VAS) found lesser in group A(0.56±0.55) compared to Group B(1.93±0.71). It showed highly significant statistical difference (p value≤0.001).

At 5min VAS was 1.45±0.5in group A and 2.78±0.65in group B. At 15min VASwas 2.28±0.63in group A and 4.18±0.69in group B. At 30 min it was 2.21±0.65 in group A and 5.25±0.67in group B. At 60 min it was 3.31±0.53 in group A and 5.43±0.50in group B. At 120 min VAS was 4.43±0.5

in group A and 6.25±0.43in group B. As shown table above at 1 min, 5min, 15 min, 30 min, 60min and 120 min both group showing highly significant difference.(p value≤0.001).

From above readings we observed that the total duration of analgesia was longer in group A as compared to group B. Hence, requirement of first rescue analgesia was earlier in group B as compared to group A.

Table 2: Comparison of post-operative Sedation score at various interval between Group A and Group B

Duration	Group A	Group B	P value
1 min	3.09±0.61	2.09±0.77	≤0.001
5 min	4.00±0.62	2.06±0.8	≤0.001
15 min	2.62±0.49	2.09±0.58	≤0.001
30 min	3.03±0.53	1.43±0.5	≤0.001
60 min	1.53±0.50	1.03±0.17	≤0.001
120 min	1.12±0.33	1.06±0.24	≥0.05

At 1 min post-operative sedation score was 3.095±0.61 and 2.09±0.77 in group A and B respectively. At 5 min post-operative sedation score was 4.00±0.62 in group A and 2.06±0.8 in group B. At 15min it was 2.62±0.49 in group A and 2.09±0.58 in group B. At 30 min and 60 min post-operatively sedation score was noted high in group A as compared to group B. From 1 min to 60 min sedation score found statistically significantly (P<0.001). At 120 min post-operative sedation score was almost equal in both the groups (P>0.05). Time for first required analgesia in Group A was much higher (232.81±26.02 min) then in group B (51.25±16.6 min), showing highly significant difference statistically (p value≤0.001).

Hence, requirement of first rescue analgesia was earlier in group B as compared to group A. As above data showing, cumulative analgesia required in Group A was much higher (185±29.83 mg) then group B (95.22±25.51mg), showing highly significant difference statistically. (p value≤0.001).

Discussion

A major advantage of laparoscopic surgery is reduced postoperative stay but to avail this, it needs high-quality analgesia that is essential to prevent delayed hospital discharge. By the nature of minimally invasive surgery, the pain is often short, yet intense, and up to 80% of patients will require opioid analgesia at some stage perioperatively. Pain will usually be maximal during the first 2 h post-procedure and a prolonged duration of significant discomfort is rare and should raise the possibility of additional complications. Postoperative shoulder-tip pain after laparoscopic surgery is also much common [10-15].

The risks associated with laparoscopic surgery may be categorized as patient-specific, surgical, positional, or those associated with altered physiology secondary to the generation of pneumoperitoneum. The uses of regional techniques such as subarachnoid, epidural, and more recently transverseabdominis plane block, are increasingly utilized as opiate-sparing techniques, particularly in laparoscopic techniques where larger incisions are required. Wound infiltration with local anaesthetic is also found useful and reduces postoperative analgesic requirements. Intraperitoneal levobupivacaine reduces postoperative pain and opiate requirements. Alpha-2 agonist like Dexmedetomidine has also been suggested before induction to reduce subsequent opiate analgesia requirements in the first 2 h after laparoscopic surgeries [16,17].

Alpha-2 agonists are known to affect hemodynamic stability during intra-operative period due to sympatholytic properties. These clinical characteristics make this iv agent a potentially attractive adjunct for surgeries conducted under GA for laparoscopy. Alpha-2 receptors are also involved in regulating autonomic and cardio-vascular systems. They are located on blood vessels where they mediate vaso-constriction on the sympathetic terminals and inhibit nor-epinephrine release. Their activation leads to reduction of tonic levels of sympathetic outflow and augment cardiac vagal activity [18].

As a biphasic cardiovascular response of dexmedetomidine, there is a transient increase in arterial blood pressure and a reflex decrease in heart rate. To avoid the initial transient hypertension, we have used the infusion over a period of 10-15 minutes. Specificity of Dexmedetomidine for alpha2 receptors especially for 2A–subtype, causes it to be a much more effective analgesic agent. So, Alpha2 agonists' have been recognized as having significant analgesic effects.

Dexmedetomidine exerts its sedative and anxiolytic effects through activation of α2receptors in locusceruleus, a major site of noradrenergic innervations in CNS. The locusceruleus has been implicated as a key modulator for a variety of critical brain functions like arousal, sleep and anxiety. Dexmedetomidine produces a "co-operative form" of sedation, in which patients easily transition from sleep to wakefulness and task performancewhen aroused. Alpha2 agonists have been recognized as having significant analgesic effects. The primary site of action is to be the substantia gelatinosa of spinal cord at alpha-2creceptorsby inhibiting the firing of nociceptive neurons and in the dorsal horns where dexmedetomidine reduces the release of nociceptive neurotransmitters like substance P so it reduces opioid requirement. During the intra-operative and post-operative period, the occurrence of side-effects like hypotension and bradycardia were noted and all patients were observed for respiratory depression, sedation, nausea, vomiting or any other side effect or complication post operatively.

1. Hypotension is defined as systolic BP<90 mm of Hg. Inj. Ephedrine 6 mg iv. was used to treat hypotension.
2. Bradycardia is defined as HR<60 beats/min Inj. Atropine 0.6 mg I.V. was used to treat bradycardia.

We make sure that both groups under study were comparable to each other with respect to demographic data like age, sex, height, weight, ASA grading and duration of surgery. There was no significant difference between two groups in terms of mean age, mean height, mean weight, sex ratio, ASA grading and duration of surgery ($p \geq 0.05$).

Conclusion

From findings of present study we conclude that Low dose Dexmedetomidine infusion surely attenuates sympathoadrenal response and provides better haemodynamic stability in critical incidences like laryngoscopy, endotracheal intubation and pneumoperitoneum in patients undergoing laparoscopic surgeries as compared to group NS(normal saline). Dexmedetomidine also provided significant level of sedation post-operatively (mean ramsay sedation score was between 3 to 4) as compared to NS (mean RSS was between 1 to 2).

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