

COMPARATIVE EVALUATION OF CLONIDINE VS DEXMEDETOMIDINE FOR LAPAROSCOPIC SURGERY BY RAMSAY SCORE AND ADVERSE EFFECTS

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ABSTRACT:

Background: Clonidine and Dexmedetomidine acts as exogenous agonist for α_2 adrenoceptors and exerts benefits in anesthesia in reduction in anaesthetic dose, sedation, attenuation of stress response and analgesia. **Material & Methods:** In the present retrospective study, Patients with ASA grades I and II and who were operated under laparoscopic procedure during the one year of study period were enrolled by simple random sampling and randomized for two equal groups. **Results:** In the present study, out of the total study participants on the basis of Ramsay sedation scores, it was found that Ramsay score of 3 was most common among both the groups which were followed by Ramsay score of 4. The Ramsay score 2 and 5 were the least recorded scores. In the group 1 the mean Ramsay sedation score was 3.31 ± 1.32 . In the group 2 the mean Ramsay sedation score was 3.14 ± 1.01 . This difference was statistically non-significant (p value > 0.05). Hypotension was the most common adverse effect reported among both the study groups. Rebound hypertension was not reported among study participants of both the groups. **Conclusion:** We concluded from the present study that Both Clonidine and Dexmedetomidine were found to be significantly effective in reducing the hemodynamic response due to formation of pneumoperitoneum during laparoscopic surgeries and both Clonidine and Dexmedetomidine provides adequate postoperative analgesia and sedation as a premedication agent.

Key words: Clonidine, Dexmedetomidine, Laparoscopic surgery.

INTRODUCTION:

The operationalization of laparoscopic surgeries is increasing in recent years because of the advantage of lesser tissue damage, lesser need of analgesics, early ambulation and decreased hospital stay (1). While crating the pneumoperitoneum with carbon dioxide (CO₂) during laparoscopy sympathetic nervous system is stimulated and increase in arterial pressure and systemic as well as pulmonary vascular

resistance is observed (2). Adverse cardiologic effects reported in patients with pre-existing ischemic cardiac disease, essential hypertension, increased intra-cranial and intra-ocular pressure (3). In the central and peripheral nervous systems α_2 adrenoceptors which are present on pre- and post-synaptic autonomic ganglia responsible for G-protein coupling by the inhibition of both

phospholipase C and adenylyl cyclase activity and leads to subsequent effects (4).

Clonidine and Dexmedetomidine acts as exogenous agonist for α_2 adrenoceptors and exerts benefits in anesthesia in reduction in anaesthetic dose, sedation, attenuation of stress response and analgesia (5). Clonidine premedication reduces the stress response to surgical stimuli and also reduces requirement of the anaesthetic dose and analgesia and additionally has stabilizing effect over blood pressure through baroreceptors (6). It was reported that clonidine reduces the heart rate, systemic vascular resistance and inhibits the release of catecholamines and vasopressin induced by pneumoperitoneum in laparoscopy which modulates the hemodynamic changes (7). It was reported that dexmedetomidine also modulates the hemodynamic changes by inhibiting the release of catecholamines and vasopressin induced by pneumoperitoneum in laparoscopy. Various studies have been reported the anxiolytic and sedative properties as well as sympatholytic characteristics of dexmedetomidine (8). We conduct present study to assess the comparative evaluation of clonidine and dexmedetomidine for laparoscopic surgery by ramsay score and adverse effects.

MATERIALS & METHODS

The present prospective study was conducted at our tertiary care hospital and the study duration was one year from January 2014 to December 2014. A sample size of 60 was calculated at 95% confidence interval at 5% of maximum allowable error. Patients with ASA grades I and II and who were operated under laparoscopic procedure during the one year of study period were enrolled by simple random sampling and randomized for

two equal groups. Clearance from hospital ethics committee was taken before start of study. Written informed consent was taken from each study participant.

All the data were recorded related to detailed clinical history, cause of admission, APACHE -2 scores, and co-morbidities. Patients with cardiovascular, renal disease, neurologic disease, hepatic diseases, diabetic mellitus, procedure duration more than 120 minutes, patients who were taking anti-hypertensive, analgesics, antipsychotics or sedative medicines and pregnant or breast feeding females were excluded from the present study. Study participants were divided in two groups 1st Group received 2 $\mu\text{g}/\text{kg}$ of clonidine diluted in 10 ml of normal saline iv and 2nd group received 1 $\mu\text{g}/\text{kg}$ of dexmedetomidine dilute in 10 ml normal saline iv, before induction of general anaesthesia. All the study participants were subjected to electrocardiography, end tidal CO₂, temperature and baseline cardio-respiratory parameters were also recorded. Data analysis was carried out using SPSS v22. All tests were done at alpha (level significance) of 5%; means a significant association present if p value was less than 0.05.

RESULTS

In the present study, we enrolled 60 patients who were operated under laparoscopic procedure during the one year of study period. Out of the total study participants (26) 43.3% were females and (34) 56.6% were males. The mean age of study population was 43.55 ± 5.9 years. Study participants were divided in two groups 1st Group received 2 $\mu\text{g}/\text{kg}$ of clonidine diluted in 10 ml of normal saline iv and 2nd group received 1 $\mu\text{g}/\text{kg}$ of dexmedetomidine dilute in 10 ml

normal saline iv, before induction of general anaesthesia. Out of the total study participants of group 1 12 (40%) were females and 18 (60%) were males. The mean age of study population was 42.6 ± 5.8 years. The mean value of APACHE II-score was 12.54 ± 01.98 . Out of the total study participants of group 2, 14 (46.6%) were females and 16 (53.4%) were males. The mean age of study population was 44.5 ± 6.2 years. The mean value of APACHE II-score was 12.32 ± 02.01 (Table 1)

Table 1: Distribution of study participants according to study parameters.

Study parameters	Group 1 (n=30)	Group 2 (n=30)
Mean age (years)	42.6 ± 5.8	44.5 ± 6.2
Gender	18:17	19:16
Male	18 (60%)	16 (53.4%)
Female	12 (40%)	14 (46.6%)
APACHE II-score	12.54 ± 01.98	12.32 ± 02.01

Table 2: Distribution of Ramsay Sedation Score among study groups.

Ramsay Sedation Score	Group 1	Group 2	p value
Mean	3.31	3.14	0.647
SD	1.32	1.01	

On the basis of Ramsay sedation scores, it was found that Ramsay score of 3 was most common among both the groups which was followed by Ramsay score of 4. The Ramsay score 2 and 5 were the least recorded scores. In the group 1 the mean Ramsay sedation score was 3.31 ± 1.32 . In the group 2 the mean Ramsay sedation score was 3.14 ± 1.01 . This difference was statistically non-significant (p value > 0.05). (Table 2)

We found that hypotension was the most common adverse effect reported among both the study groups. Rebound hypertension was not reported among study participants of both the groups. Among group 1 10 (33.3%) of study participants had hypotension and among group 2, 4(13.3%) of study participants had hypotension. This difference was statistically significant (p value < 0.05). Among group 1, 4 (13.3%) of study participants had bradycardia and among group 2, 3 (10%) of study participants had bradycardia. This difference was statistically non-significant (p value > 0.05). (Table 3)

Table 3: Distribution of study participants according to adverse effects.

Adverse effects	Group 1	Group 2	p value
Hypotension	10 (33.3%)	4(13.3%)	< 0.05
Bradycardia	4 (13.3%)	3 (10%)	> 0.05
Rebound hypertension	0	0	0

DISCUSSION

We enrolled 60 patients who were operated under laparoscopic procedure during the one year of study period. Out of the total study participants (26) 43.3% were females and (34) 56.6% were males. The mean age of study population was 43.55 ± 5.9 years. Study participants were divided in two groups 1st Group received 2 µg/kg of clonidine diluted in 10 ml of normal saline iv and 2nd group received 1 µg/kg of dexmedetomidine dilute in 10 ml normal saline iv, before induction of general anaesthesia. Out of the total study participants of group 1 12 (40%) were females and 18 (60%) were males. The mean age of study population was 42.6 ± 5.8 years. The mean value of

APACHE II-score was 12.54 ± 01.98 . Group 2, 14 (46.6%) were females and 16 (53.4%) were males. The mean age of study population was 44.5 ± 6.2 years. The mean value of APACHE II-score was 12.32 ± 02.01 . Similar results were obtained in a study conducted by Bijoy Kumar Panda et al for the Comparative study of Clonidine and Dexmedetomidine for sympathoadrenal response, perioperative anaesthesia requirements and cost evaluation. They reported similar results as the present study (9). Similar results were obtained in a study conducted by Praveen Chandra et al for the Comparative study of Clonidine and Dexmedetomidine among patients undergoing surgery for fractures of femur and tibia. They reported similar results as the present study (10).

On the basis of Ramsay sedation scores, it was found that Ramsay score of 3 was most common among both the groups which was followed by Ramsay score of 4. The Ramsay score 2 and 5 were the least recorded scores. In the group 1 the mean Ramsay sedation score was 3.31 ± 1.32 . In the group 2 the mean Ramsay sedation score was 3.14 ± 1.01 . This difference was statistically non-significant (p value > 0.05). Similar results were obtained in a study conducted by Mallika Ganesh et al for the Comparative study of Clonidine and Dexmedetomidine among patients undergoing surgery as an adjuvant to intrathecal bupivacaine for lower abdominal surgeries. They reported similar results as the present study (11). Similar results were obtained in a study conducted by Vidhi Mahendru et al for the Comparative study of Clonidine and Dexmedetomidine among patients undergoing surgery as adjuvants to hyperbaric bupivacaine among patients undergoing lower limb surgery in their double

blind controlled study. They reported similar results as the present study (12).

Rebound hypertension was not reported among study participants of both the groups. Among group 1 10 (33.3%) of study participants had hypotension and among group 2, 4(13.3%) of study participants had hypotension. This difference was statistically significant (p value < 0.05). Among group 1, 4 (13.3%) of study participants had bradycardia and among group 2, 3 (10%) of study participants had bradycardia. This difference was statistically non-significant (p value > 0.05). Similar results were obtained in a study conducted by Summaira Jan et al for the Comparative study of Clonidine and Dexmedetomidine for assessing hemodynamic responses at different surgical stages among patients undergoing for elective transnasal transsphenoidal resection of pituitary tumors. They reported similar results as the present study (13). Similar results were obtained in a study conducted by Rajdip Hazra et al for the Comparative study of Clonidine and Dexmedetomidine for assessing hemodynamic responses during laparoscopic cholecystectomy. They reported similar results as the present study (14).

CONCLUSION

We concluded from the present study that Both Clonidine and Dexmedetomidine were found to be significantly effective in reducing the hemodynamic response due to formation of pneumoperitoneum during laparoscopic surgeries and both Clonidine and Dexmedetomidine provides adequate postoperative analgesia and sedation as a premedication agent.

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