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Original Research Article

A comparative study to evaluate efficacy between intravenous dexmedetomidine and intravenous clonidine for postoperative visual analogue scale in cases of abdominal laparoscopic surgeries under general anaesthesia. A prospective randomised case control study

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Abstract:
Background & Method: The aim of the study is to compare efficacy between intravenous Dexmeditomidine and intravenous Clonidine for postoperative VAS score & hemodynamics stability in general anaesthesia cases undergoing laparoscopic surgeries. Patients were premedicated with injection glycopyrrolate 0.2 milligrams in the preoperative room. Upon arrival in the operating room monitors were attached and baseline parameters example heart rate, NIBP, oxygen saturation and ECG were recorded. Immediately before induction patients were randomly divided into two groups.
Result: The mean VAS in the dexmedetomidine group was 1.08±0.79, while in the clonidine group it was 3.93±0.68. The difference was found to be statistically significant ($P<0.05$), showing a higher VAS score in the clonidine group in comparison to the dexmedetomidine group.
Conclusion: In postoperative period better hemodynamics, lesser requirement of opioid analgesics, is observed in dexmedetomidine group as compared to clonidine group. Dexmedetomidine group visual analogue score was better than clonidine group.

Keywords: efficacy, dexmeditomidine, clonidine, anaesthesia & laparoscopic surgeries.

Study Designed: Randomised Case Control Study.

1. Introduction

Laparoscopic surgeries have revolutionized surgical procedures mainly due to important advantages it offer. It takes lesser time in experienced hands, decreased postoperative pain, shorter duration of hospital stay, minimal postoperative morbidity and mortality but patients may be exposed to prolonged operating times.
Requires induction of pneumoperitoneum usually with carbon dioxide, recommended safe limit for insufflation of CO_2 gas to be insufflated at the rate 4 liters per minute with total gas volume of 3-5 litres and intraperitoneal pressure of 8 to 14 mmHg for total duration of

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surgery of 30 to 40 minutes. The hemodynamic changes in laparoscopy are secondary to pneumoperitoneum, reverse trendelenberg position, hypercarbia and effects of general anesthesia itself.

The effects on the respiratory system are mainly due to pneumoperitoneum and use of carbon dioxide as the insufflation gas. There is reduction in functional residual capacity as there is cephalad displacement of diaphragm, decrease in chest wall dimensions and muscular tone with changes in intrathoracic blood volume leading to hypoxaemia, atelectasis and pulmonary shunting. There is increase in alveolar- arterial gradient and increase in shunt fraction. The reduction in functional residual capacity leads to increase in peak airway pressures.

Objective

Primary Objective:

To compare VAS score between dexmedetomidine & clonidine group.

Secondary Objective:

To compare hemodynamics stability between two groups.

2. Material & Method

This study was conducted at Index Medical College Hospital & Research Centre, Indore, M.P. for 18 months, includes 150 patients of ASA physical status I & II aged between 18 to 50 years of either sex scheduled for elective laparoscopic abdominal surgeries were randomised into two groups (group C, group D) .

Data was collected in pretested proforma meeting the objectives of study. Preoperative assessment was done for each patient and written informed consent was taken. Proper nil per oral status was checked before proceeding for each case. No hypnotic medications were given on the evening before surgery. Patients were premedicated with injection glycopyrrolate 0.2 milligrams in the preoperative room. Upon arrival in the operating room monitors were attached and baseline parameters example heart rate, NIBP, oxygen saturation and ECG were recorded. Immediately before induction patients were randomly divided into two groups.

Inclusion Criteria

1. Age between 18 to 50 years.
2. ASA Physical status I & II.

Exclusion Criteria

1. Allergies to the drugs used.
2. Acute cholecystitis.
3. Patient concomitantly taking clonidine, methyldopa,

3. Results

Table No. 1: Comparison of mean age & mean duration of surgery between the two groups

Parameter	Dexmedetomidine Group		Clonidine Group		't' value	P value
	No.	[Mean±SD]	No.	[Mean±SD]		
Age	76	37.00±7.29	74	42.72±4.93	-3.317, df=73	0.001*
Duration of surgery		1.74±0.57		1.88±0.38	-1.365, df=73	0.176, NS

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The mean age in the dexmedetomidine group was 37.00±7.29 years and in the clonidine group was 42.72±4.93 years. The difference was found to be statistically significant (P<0.05), showing a higher age in the clonidine group in comparison to the dexmedetomidine group. The duration of surgery in the dexmedetomidine group was 1.74±0.57 hours, while in the clonidine group it was 1.88±0.38 hours.

Table No. 2: Comparison of mean pulse rate at different time intervals from the preoperative value in the dexmedetomidine group

Time interval	Dexmedetomidine Group [Mean±SD]		't' value	P value
Preop.	150	79.74±4.42	-	-
0 min		75.42±5.09	10.467, df=37	0.000*
3 min		73.21±5.05	13.801, df=37	0.000*
5 min		69.32±4.27	12.702, df=37	0.000*
15 min		69.21±4.59	13.928, df=37	0.000*
25 min		68.26±4.65	13.300, df=37	0.000*
35 min		67.32±5.39	12.257, df=37	0.000*
45 min		67.16±4.52	14.204, df=37	0.000*
60 min		69.68±5.06	11.974, df=37	0.000*
120 min		70.12±4.01	10.962, df=33	0.000*
180 min		71.40±6.84	5.085, df=4	0.015*

In the dexmedetomidine group, the mean pulse rate reduced at 0 min in comparison to the and continued its reduction till 45 minutes, then showed a slight rise till end of the 180 minutes. The mean pulse rate was significantly lower at all the other time intervals in comparison to the preoperative level (P<0.05), in the dexmedetomidine group.

Table No. 3: Comparison of mean pulse rate at different time intervals from the preoperative value in the clonidine group

Time interval	Clonidine Group [Mean±SD]		't' value	P value
Preop.	150	79.92±4.46		
0 min		80.78±4.66	-3.462, df=36	0.019*
3 min		81.97±5.65	-4.436, df=36	0.002*
5 min		82.51±5.82	-5.694, df=36	0.000*
15 min		82.84±6.21	-5.650, df=36	0.000*
25 min		83.70±6.77	-7.423, df=36	0.000*
35 min		84.89±6.63	-4.944, df=36	0.000*
45 min		83.49±5.72	-6.175, df=36	0.000*
60 min		82.95±6.12	-5.433, df=36	0.000*
120 min		83.63±5.33	-7.565, df=34	0.000*
180 min		90.00±4.24	-2.000, df=1	0.500, NS

In the clonidine group, the mean pulse rate keep on increasing till 25 minutes in comparison to the preoperative value, then slight reduction at 35 minutes, then increased at 45 min, then reduction at 60 min, then increased till 180 minutes. The mean pulse rate was significantly

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higher at all the other time intervals in comparison to the preoperative level (P<0.05), in the clonidine group.

Table No. 4: Comparison of mean VAS between the two groups

Parameter	Dexmedetomidine Group		Clonidine Group		't' value	P value
	No.	[Mean±SD]	No.	[Mean±SD]		
VAS	76	1.08±0.79	74	3.93±0.68	-26.473, df=73	0.000*

The mean VAS in the dexmedetomidine group was 1.08±0.79, while in the clonidine group it was 3.93±0.68. The difference was found to be statistically significant (P<0.05), showing a higher VAS score in the clonidine group in comparison to the dexmedetomidine group.

4. Discussion

In our study VAS score was slightly higher in clonidine group than the dexmedetomidine group because clonidine causes dose dependent sedation and analgesia[6]. In clonidine group visual analogue score was more.

Laparoscopic surgery is a high risk factor for postoperative nausea and vomiting. Patient undergoing general anesthesia for laparoscopic surgeries have high risk for postoperative nausea and vomiting with incidence upto 75%. Since in our study proseal LMA which was partially inflated was used so rate of nausea and vomiting was not present[7].

Sore throat after tracheal intubation was common with an incidence of 30- 70 percent. In our study the incidence of sore throat was absent. In out of 150 cases in 6 cases there was incidence of blood staining of proseal LMA present.

Deepshikha et al[8] concluded that intravenous clonidine @ 2 micrograms per kg 30 minutes prior to induction is safe in preventing hemodynamic stress response during laparoscopic surgery.

Nand Kishore Kalra et al[9] concluded that administration of magnesium sulphate or clonidine attenuates hemodynamic response to pneumoperitoneum. Although magnesium sulphate 50 mg per kg produces hemodynamic stability comparable to clonidine 1 micrograms per kilograms but clonidine in doses of 1.5 micrograms per kg blunts the hemodynamic response to pneumoperitoneum more effectively.

Manjaree Mishra et al[10] concluded that clonidine is more effective than nitroglycerine at preventing changes in hemodynamic parameters and intraocular pressure induced by carbon dioxide insufflation during laparoscopic cholecystectomy.

5. Conclusion

In postoperative period better hemodynamics, lesser requirement of opioid analgesics, is observed in dexmedetomidine group as compared to clonidine group. Dexmedetomidine group visual analogue score was better than clonidine group.

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