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Effect of Dexmedetomidine for Haemodynamic Stability in Laparoscopic Surgeries

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ABSTRACT

Two groups were formed, one received dexmedetomidine 1mcg /kg infusion for 15 minutes and other received saline0.9%. The heart rate was 73.90 ± 10.81 in group received dexmedetomidine against 91.53 ± 15.63 in the control group after Co 2 insufflation. Mean heart rate was 85(17) which fell to lowest of 72(13); p=0.0001. The mean systolic blood pressure was 125.37 ± 17.95 and diastolic blood pressure was 83.53 ± 12.35 after creation of pneumoperitoneum which was statistically significant. after creation of pneumoperitoneum, the heart rate was significantly decreased 76.17 ± 10.27 compared to the control group.

Key words: Pneumoperitoneum, Mean heart rate

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INTRODUCTION

Dexmedetomidine belongs to alpha-2 adrenoreceptor agonist group of drugs. Compared to other existing drugs they are more specific for alpha 2 receptors. when a laparoscopic surgery is performed a pneumoperitoneum should is created by insufflation with air or carbon dioxide. The created pneumoperitoneum causes several pathophysiological changes during the surgery [1-4]. To avoid such complications and obtain hemodynamic stability various drugs have been used such as clonidine and dexmedetomidine. They have the potential to maintain the blood pressure during laparoscopic surgeries. Hence this study deals with the action of one such drug, dexmedetomidine on the hemodynamic stability during laparoscopic surgeries.

METHODOLOGY

Patients (60Nos) of ASA I & II physical status aged 18-60 years were selected who were scheduled to undergo elective laparoscopic surgeries. They were randomized and allotted into two groups (D&F). Group D received dexmedetomidine 1 mcg/kg infusion before induction (n=30) with propofol 2mg/kg IV and fentanyl l mcg/kg IV-(n=30) Group F received fentanyl lmcg/kg with propofol 2mcg/kg IV (n=30). Then the hemodynamic stability during the surgery were assessed for the following parameters-Heart rate, blood pressure and oxygen saturation were observed and recorded at baseline, after dexmedetomidine infusion, after induction, insufflation of Co2, at 30 and 45 mins and after extubating.

RESULTS

Heart rate was compared before induction, after induction, after carbon dioxide insufflation, after 30 minutes, 45 mins, after extubation was compared in both groups and tabulated in Table 1.

Table 1: Heart rate comparison.

Variables	Dexmed		Fentanyl	p-value
	Range	Mean ± SD	Range	Mean ± SD
Basal	60-112	82.9 ± 12.23	63-110	86.2 ± 12.7	0.309
After induction	55-90	74.17 ± 12.79	60-118	80.23 ± 14.02	0.06
Co2 insufflations	54-104	76.17 ± 10.27	70-118	89.87 ± 3.31	P<0.001

After 30 min	55-102	79.03 ± 12.62	68-124	89.43 ± 12.44	0.001**
After 45 min	55-110	77.8 ± 11.4	60-124	85.97 ± 12.25	0.009**
After Extubation	60-95	79.27 ± 8.87	62-106	84.27 ± 10.02	0.04*
P-value	P<0.001		P<0.001		

Systolic and diastolic blood pressure was compared before induction, after induction, after carbon dioxide insufflation, after 30 minutes, 45 mins, after extubating was compared in both groups (Figures1 and 2).

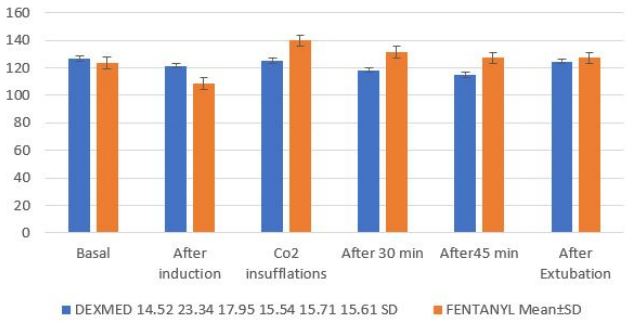

Figure 1: Systolic BP.

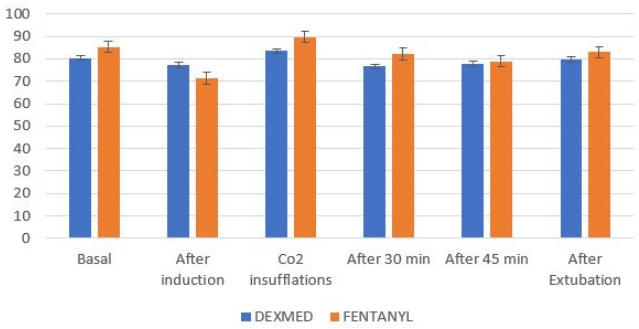

Figure 2: Diastolic BP.

Mean blood pressure and oxygen saturation was also compared between two groups and there were not much difference and results are tabulated
(Tables 2 and 3).

Table 2: Mean blood pressure.

Variables	Dexmed		Fentanyl		p-value
	Range	Mean ± SD	Range	Mean ± SD	
Basal	68-120	93.73 ± 12.96	68-137	100.47 ± 15.61	0.074
After induction	65-133	93.93 ± 16.03	62-104	84.57 ± 9.76	0.008**
Co2 insufflations	73-129	98.37 ± 13.59	74-137	106.37 ± 14.24	0.029*
After 30 min	74-119	91.07 ± 12.34	65-125	98.33 ± 14.02	0.037*
After45 min	65-137	91 ± 14.05	76-126	96 ± 12.58	0.15
After Extubation	73-122	95.67 ± 11.48	73-126	97.37 ± 10.18	0.546
P-value	0.024*		P<0.001***		

Table 3: Oxygen saturation.

Variables	**Dexmed**		**Fentanyl**		p-value
	Range	**Mean ± SD**	**Range**	**Mean ± SD**	
Basal	97-100	98.77 ± 0.94	81-100	98.3 ± 3.38	0.501
After induction	98-100	99.93 ± 0.36	100-100	100 ± 0	0.322
Co2 insufflations	98-100	99.9 ± 0.55	100-100	100 ± 0	0.321
After 30 min	97-100	99.87 ± 0.57	100-100	100 ± 0	0.206
After 45 min	97-100	99.87 ± 0.57	100-100	100 ± 0	0.206
After Extubation	98-100	99.9 ± 0.402	100-100	100 ± 0	0.179
P-value	P<0.001		0.01*		

DISCUSSION AND CONCLUSION

This study elaborates the effects of dexmedetomidine on hemodynamic. Stability in patients undergoing laparoscopic surgeries and when the results are compared with the similar study done by Khare et al. [2] there was transient fall in heart rate at beginning of dexmedetomidine infusion however sustained entire duration of infusion. Patients had sinus bradycardia

(HR<60) at start, but none required treatment. Mean systolic blood pressure was 125 (22) at start and fell to 113(20) with dexmedetomidine but in this study mean heart rate was ranging from 54 to a maximum of 112. The patients did not require any treatment for the bradycardia. The effect of single preoperative dose of dexmedetomidine on the hemodynamic response to laryngoscopy and intubation, perioperative hemodynamics and anaesthetic requirements [3-10]. The blood pressure and heart rate were significantly lower ($p<0.05$) in the dexmedetomidine group which is like our study wherein after creation of pneumoperitoneum, the heart rate was significantly decreased 76.17 ± 10.27 compared to the control group. The systolic blood pressure was 125.37 ± 17.95 and diastolic blood pressure is 83.53 ± 12.35 compared to the compared to control group which was sbp 139.87 ± 18.33 and dbp 89. 73 ± 12.51 which was significant. These results were consistent with our results.

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