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Effects Of Dexmedetomidine In Laparoscopic Surgeries: A Case Study.

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ABSTRACT

This study was carried out on 32 adult ASA I & II patients to evaluate the effect of dexmedetomidine in laparoscopic surgeries. The administration of dexmedetomidine maintains the hemodynamic stability after carbon dioxide insufflation during laparoscopic surgeries.

Keywords: dexmedetomidine, haemodynamic stability and laparoscopic surgeries.

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INTRODUCTION

Dexmedetomidine is a centrally acting alpha- 2 adrenoreceptor agonist. It has sympatholytic, sedative, anesthetic sparing and haemodynamic stabilising properties without significant respiratory depression. These properties help in maintaining the blood pressure during laparoscopic surgeries which would otherwise tend to increase during surgery [1,2]. Laparoscopic surgeries are in development these days with advantages of minimal invasion,early mobilization and early discharge from hospital.

Aim

To observe the effects of dexmedetomidine on the hemodynamic responses during laparoscopic surgeries.

METHOD

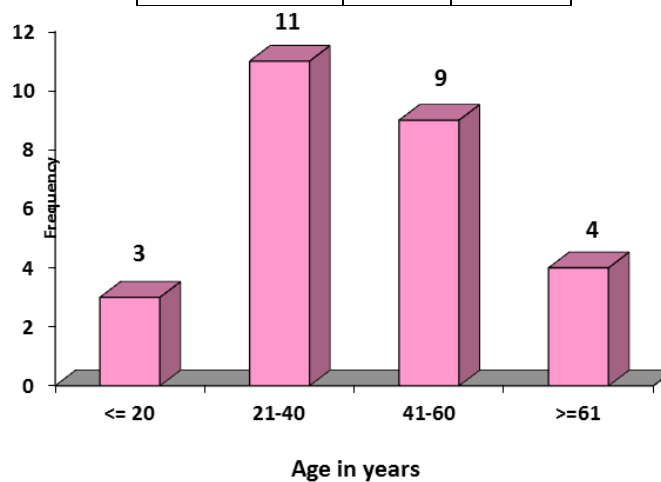
After obtaining institutional ethical approval & informed consent of patients , 32 adults ASA grade I & II, scheduled for laparoscopic surgeries were enrolled in this study like laparoscopic cholecystectomy, appendicectomy, hernioplasty, rectectomy.This is a prospective randomized study.Patients with cerebrovascular diseases, systemic hypertension, renal arterial disease, COPD, hepatic diseases were excluded from the study. All patients were assessed the day before surgery and was advised tab. alprazolam 0.5mg orally at night.On the O.T table patient’s pulse,B.P,SpO2,E.C.G were recorded. Intravenous line secured. Patients were premedicated with inj. glycopyrrolate 0.05mg/kg iv,inj. ondansetron 4mg iv ,inj. fentanyl 2mg/kg iv and was induced and intubated with inj. propofol 2mg/kg iv,inj. atracurium 0.5 mg/kg iv after 3 minutes of mask ventilation. The pulse,B.P and SpO2 were measured after induction, intubation, after carbon dioxide insufflation,5 mins,10 mins,15mins and 20 mins after dexmedetomidine administration. The patients were extubated after completion of the surgical procedure.B.P ,pulse measured in the post operative ward for any hypotension and bradycardia.

RESULTS

Results obtained from the study was analysed statistically by paired ‘t’ test & corresponding ‘p’ value computed . ‘p’ value < 0.05 – was considered statistically significant.

Frequency and percentage wise distribution of cases according to their age:

Age	f	%
≤20	3	11
21-40	11	41
41-60	9	33
≥61	4	15
Total	27	100

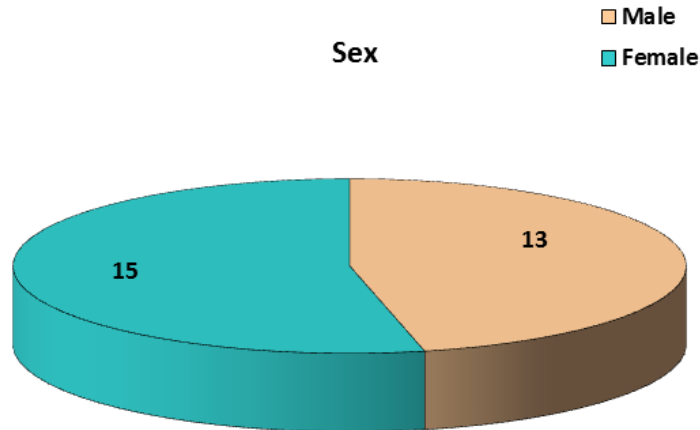


Mean and SD for age

Age	Mean \pm SD	Range
	40.25 \pm 18.11	11-75

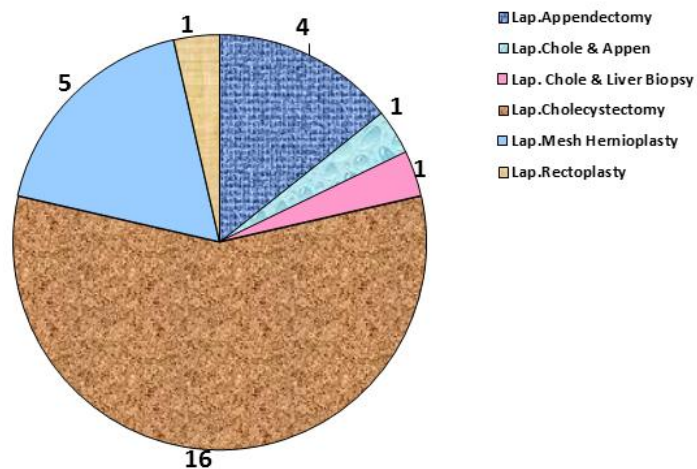
Frequency and percentage wise distribution of cases according to their sex :

Sex	f	%
Male	13	46
Female	15	54
Total	28	100



Frequency and percentage wise distribution of cases according to their procedure

Procedure	f	%
Lap.Appendectomy	4	14.3
Lap.Chole&Appen.	1	3.6
Lap.Chole&Liver Biopsy	1	3.6
Lap.Cholecystectomy	16	57
Lap.Mesh Hernioplasty	5	17.9
Lap.Rectoplasty	1	3.6
Total	28	100



Paired 't'-test was found to statistically significant difference between after Propofol induction and 20 min after Dexmedetomidine

Parameter	After Propofol induction	20 min After Dexmedetomidine	't' -value	P-Value
	Mean± SD	Mean ± SD		
Systolic BP	93±10.95	113.07±17.97	5.32	P<0.001
Diastolic BP	62.5±10.89	73.21±11.69	4.48	P<0.001
Heart rate	77.4±14.61	73.5±13.22	1.41	0.168

Paired 't'-test was found to statistically significant difference between after CO₂ insufflations and 20 min after Dexmedetomidine

Parameter	After CO ₂ insufflations	20 min After Dexmedetomidine	't' -value	P-Value
	Mean± SD	Mean ± SD		
Systolic BP	145.32±16.59	113.07±17.97	9.55	P<0.001
Diastolic BP	93.21±11.02	73.21±11.69	8.72	P<0.001
Heart rate	86.32±13.88	73.5±13.22	6.85	P<0.001

Relationship was found between systolic and diastolic BP:

Parameters		Measure	
		'r' -value	P -value
Starting basal	Systolic BP	0.568	0.002*
	Diastolic BP		
Profocol inducing	Systolic BP	0.622	0.0004*
	Diastolic BP		
After CO ₂ insufflations	Systolic BP	0.52	0.004*
	Diastolic BP		
20 min After Dexmedetomidine	Systolic BP	0.717	P<0.001

There was statistically significant difference in the blood pressure after carbon dioxide insufflation and administration of dexmedetomidine.

DISCUSSION

Laparoscopic surgeries are in the development these days. They are minimally invasive, early mobilization and helps in early discharge from hospital. Though during surgery there might be hemodynamic instability in pre disposed persons. There might be rise in airway pressure, difficulty in ventilation. For that reason, to overcome the hemodynamic instability newer drugs like dexmedetomidine and clonidine being used.

Dexmedetomidine is newer drug which is being increasingly used for its potential sympatholytic, sedative, haemodynamic stabilizing actions [3, 4]. The main interest of our study was to evaluate the effects of dexmedetomidine's haemodynamic stabilizing property in laparoscopic surgeries [5,6].

Dexmedetomidine is an alpha 2 adrenergic agonist acts by inhibiting norepinephrine release from pre synaptic terminals. This effect is responsible for the sympatholytic effect. It produces sedation and analgesia by its action in spinal cord and locus ceruleus. Analgesia that is produced by dexmedetomidine is not only

because of sympatholysis at the peripheral level but also due to decrease in the catecholamine release in brain.

Sympatholytic effects of dexmedetomidine resulting in hypotension which helps in maintaining the rise in blood pressure during laparoscopic surgeries [5]. The sedation provided by the dexmedetomidine is of good quality and decreases the requirement of additional intravenous drugs. The combined property of sedation and analgesia of dexmedetomidine keeps the patients pain free and comfortable.

The possible side effect is bradycardia during use of dexmedetomidine.

We therefore recommend the use of dexmedetomidine during laparoscopic surgeries for haemodynamic stability.

CONCLUSION

In the modern era, with rampant laparoscopic surgeries casualties are common due to hemodynamic instability in pre disposed persons. To combat this, dexmedetomidine was a good alternative. Use of dexmedetomidine produces adequate decrease in blood pressure after carbon dioxide insufflation in laparoscopic surgeries. This maintains better haemodynamic stability similar to clonidine.

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