

ORIGINAL RESEARCH

Comparison of Haemodynamic Changes of Dexmedetomidine with That of Saline Infusion for Spine Surgery in Prone Position under General Anaesthesia

¹Dr. Sudha Helawar, ²Dr. Sudha Shree P, ³Dr. Kunder Samuel Prakash, ⁴Dr. Afra Farheen Faiaz

¹Assistant Professor, ^{2,4}Senior Resident, ³Associate Professor, Department of Anaesthesia, Kanachur Institute of Medical Sciences, Mangalore, Karnataka, India

Correspondence:

Dr. Afra Farheen Faiaz

Senior Resident, Department of Anaesthesia, Kanachur Institute of Medical Sciences, Mangalore, Karnataka, India

Received: 23 September, 2022

Accepted: 28 October, 2022

ABSTRACT

Background: In this study, we wanted to compare hemodynamic changes in patients receiving dexmedetomidine with those of patients receiving placebo.

Materials and methods: This was a hospital based randomized prospective comparative study conducted among 60 patients who presented to the Department of General Anaesthesia in Seth G S Medical College, KEM Hospital Mumbai from 2013 to 2014 after obtaining clearance from Institutional Ethics Committee and written informed consent from the study participants.

Results: The mean pre-operative heart rate in Group D was 79.83 ± 8.92 beats per minute (bpm) and in group C it was 76.97 ± 8.97 bpm and the difference was not statistically significant ($p = 0.208$). Immediately after turning the patient prone, the mean heart rate in group D was 79.83 ± 6.28 bpm and that in group C was 90.25 ± 12.32 bpm and the difference was not statistically significant (p value = 0.784). The mean heart rate was significantly lower in group D compared to group C during rest of the intra operative period. At the time of reversal, the mean heart rate was 88.73 ± 6.24 bpm and 94.31 ± 6.21 bpm in group D and group C respectively. There is significant difference in the mean heart rate with p value 0.001. The pre-operative mean SBP in group D was 123.33 ± 14.15 and that in group C was 125.94 ± 11.45 ; the difference was not statistically significant with p value 0.244. In comparison of diastolic blood pressure (DBP) at various intervals between Group D and Group C, all the p values were statistically significant. Whereas the pre-operative mean DBP was 82.10 ± 2.11 mm of Hg and 82.63 ± 3.86 mm of Hg in Group D and Group C respectively. The difference was not statistically significant (p value 0.513). In Comparison of MAP at various intervals between Group D and Group C, all the p values were statistically significant. Whereas the pre-operative mean arterial pressure (MAP) in group D patients was 95.73 ± 2.60 mm of Hg and that in group C patients was 97.50 ± 6.53 mm of Hg there is no significant difference in mean MAP between two groups p value 0.172.

Conclusion: Dexmedetomidine provides good intra-operative hemodynamic stability in spine surgeries. The incidence of bradycardia and hypotension were less with the dexmedetomidine in prone position.

Keywords: Haemodynamic, Saline Infusion, Spine Surgery, Prone Position.

INTRODUCTION

Spine surgery is one among those surgeries in which without keeping the operative field clear, it is difficult for the surgeon to visualize the structure.^[1] Maintaining the blood pressure on lower side decreases the bleeding and allows the surgery to be done successfully at minimal blood loss. Under general anaesthesia, prone position decreases the blood pressure.^[2,3] Decreasing the bleeding is very important in maintaining patient's haemodynamic stability and improving the surgical field. Various agents have been used to provide controlled hypotension like directly acting vasodilators (sodium nitroprusside, nitroglycerine), beta adrenergic blockers (Esmolol), calcium channel blockers, alpha2 agonists (clonidine and dexmedetomidine), volatile anaesthetic agents and magnesium sulphate.

Unfortunately, the available hypotensive agents are far from ideal. Cyanide toxicity and tachyphylaxis kind of side effects are seen with sodium nitroprusside. Whereas myocardial depression is seen with esmolol and magnesium sulphate. Inhalational anaesthetic agents when used at high concentration to control the blood pressure, prolong the recovery. Ideal hypotensive anaesthetic agent is one which is easy to administer, has rapid onset of action, has effect that disappears quickly after the infusion is discontinued, eliminates rapidly without producing toxic metabolites, negligible effects on vital organs, has predictable and dose dependent side effects.^[1]

AIMS AND OBJECTIVES

- To compare hemodynamic stability between patients receiving dexmedetomidine and patients receiving placebo.

MATERIALS AND METHODS

This was a hospital based randomized prospective comparative study conducted among 60 patients who presented to the Department of General Anaesthesia in Seth G S Medical College, KEM Hospital Mumbai from 2013 to 2014 after obtaining clearance from Institutional Ethics Committee and written informed consent from the study participants.

INCLUSION CRITERIA

- Age > 20 & < 65 years.
- ASA grade I.

EXCLUSION CRITERIA

- Age < 20 & > 65 years.
- Patients undergoing cervical spine surgery.
- Pregnant patients.
- Obese patients.
- Pre-operative heart rate less than 50 beats/min.

STATISTICAL METHODS

Data was entered in MS Excel and analysed using Statistical Package for Social Sciences (SPSS) software. Results were presented as tables.

RESULTS

Study parameter	Group D				Group C				Unpaired T Test	p Value
	Mean	SD	Median	IQR	Mean	SD	Median	IQR		
Pre-operative PR	79.83	8.92	79.00	12.00	76.97	8.78	77.00	12.50	1.274	0.208
5 min after Dex bolus	75.53	7.66	76.50	10.00	82.03	9.05	80.00	14.00	-3.042	0.003
10 min after Dex bolus	71.40	8.66	72.00	10.00	80.13	8.10	80.00	12.50	-4.099	0.001
At induction	60.70	8.44	59.00	8.00	70.59	8.15	70.00	14.00	-4.697	0.001
After intubation	80.10	5.89	80.50	9.00	108.53	4.57	108.00	7.00	-21.304	0.001
Position	79.83	6.28	80.00	10.00	90.25	12.32	90.50	12.32	-3.946	0.001
At incision	81.63	14.74	77.00	27.00	108.91	7.99	110.50	12.00	-9.136	0.001
15 min	81.37	11.17	89.00	20.00	97.41	16.76	88.00	33.00	-2.491	0.008
30 min	78.23	11.36	77.50	14.00	85.78	5.62	85.00	10.50	-3.115	0.001
45 min	72.87	9.64	70.00	10.00	77.72	4.99	77.50	6.50	-2.511	0.015
60 min	68.43	4.72	68.00	6.00	77.56	5.91	77.00	6.50	-6.688	0.001
75 min	67.30	5.43	68.00	7.00	76.63	7.08	78.50	6.00	-7.656	0.001
90 min	66.90	6.21	68.00	8.00	79.63	10.95	76.00	7.50	-5.58	0.001
105 min	66.33	6.16	66.00	7.00	78.19	6.21	78.00	9.50	-7.541	0.001
120 min	65.50	6.58	65.00	8.00	79.81	6.64	80.00	6.50	-8.522	0.001
135 min	65.87	5.90	65.00	8.00	80.56	4.76	80.00	4.00	-10.828	0.001
150 min	64.87	6.20	65.00	9.00	80.25	5.29	79.50	4.00	-10.539	0.001
165 min	65.20	6.59	64.50	10.00	79.25	5.30	79.50	7.00	-9.277	0.001
180 min	64.67	4.96	64.50	7.00	86.09	11.52	85.00	12.00	-9.402	0.001
At skin closure	65.35	6.12	65.00	6.00	80.22	7.60	79.00	13.00	-8.348	0.001
Supining the patient	67.77	11.40	64.50	11.00	81.56	6.36	80.00	12.00	-5.933	0.001
Reversal	88.76	6.24	89.50	5.00	94.31	6.21	94.50	9.00	-3.525	0.001
Extubation PR	102.07	4.75	104.00	7.00	117.56	6.77	116.00	10.00	-10.367	0.001
Comparison of Heart Rate at Various Interval between Group D and Group C										
<i>Table 1</i>										

In comparison of heart rate at various intervals between Group D and Group C, the p values were statistically significant. Whereas the mean pre-operative heart rate in Group D was 79.83 ± 8.92 bpm and in group C it was 76.97 ± 8.97 bpm and the difference was not statistically significant ($p = 0.208$). Immediately after turning the patient prone, the mean heart rate in group D was 79.83 ± 6.28 bpm and that in group C was 90.25 ± 12.32 bpm and the difference was not statistically significant (p value = 0.784). The mean heart rate was significantly lower in group D compared to group C during rest of the intra operative period. At the time of reversal, the mean heart rate was 88.73 ± 6.24 bpm and 94.31 ± 6.21 bpm in group D and group C respectively. There is significant difference in the mean heart rate with p value 0.001.

Study Parameter	Group D				Group C				Unpaired T Test	p Value
	Mean	SD	Median	IQR	Mean	SD	Median	IQR		
Pre-operative PR	123.33	4.15	122.00	8.00	125.94	11.45	120.00	11.00	-1.175	0.244
5 min after Dex bolus	125.80	20.19	119.00	7.00	134.41	10.15	131.50	12.00	-1.762	0.042
10 min after Dex	118.1	19.0	113.00	8.00	126.1	9.68	122.00	10.5	-2.111	0.039

bolus	7	3			9			0		
At induction	95.50	7.46	92.50	8.00	105.13	6.01	106.00	10.00	-5.610	0.001
After intubation	131.27	5.34	131.50	9.00	141.00	3.05	141.00	3.50	-8.889	0.001
Position	131.13	5.59	130.50	9.00	119.25	11.61	119.00	13.00	5.079	0.001
At incision	115.53	19.94	116.50	38.00	138.41	12.31	141.50	9.50	-5.473	0.001
15 min	122.97	12.91	123.00	18.00	133.32	22.91	118.50	41.50	-1.838	0.035
30 min	100.63	13.15	97.50	6.00	108.00	2.27	108.00	2.50	-3.121	0.030
45 min	101.73	6.11	100.00	11.00	106.69	2.61	106.00	3.00	-4.197	0.001
60 min	100.73	6.92	99.00	12.00	107.53	2.49	107.00	2.00	-5.213	0.001
75 min	98.30	4.97	98.00	8.00	107.94	3.39	108.00	3.00	-8.971	0.001
90 min	98.27	5.43	97.50	9.00	109.19	9.68	107.00	3.50	-5.429	0.001
105 min	96.60	4.30	96.00	7.00	107.91	2.22	108.00	4.00	-13.120	0.001
120 min	97.53	4.88	96.00	5.00	109.41	6.12	109.00	3.00	-8.411	0.001
135 min	96.77	5.04	95.50	5.00	108.63	2.83	108.50	2.00	-11.529	0.001
150 min	96.03	4.44	94.00	5.00	109.63	3.13	109.00	3.50	-13.993	0.001
165 min	95.90	4.52	94.00	5.00	109.25	4.13	109.00	3.00	-12.155	0.001
180 min	96.57	5.45	96.00	6.00	116.50	12.01	116.00	10.50	-8.318	0.001
At skin closure	96.93	4.73	94.50	7.00	125.41	11.97	124.50	11.00	-12.167	0.001
Supining the patient	97.23	4.80	97.50	10.00	118.34	8.23	118.00	15.00	-12.229	0.001
Reversal	115.50	8.93	115.00	18.00	133.69	9.98	135.50	11.50	-7.544	0.001
Extubation PR	134.10	8.25	135.50	14.00	153.44	5.75	153.00	8.50	-10.767	0.001

Comparison of SBP at Various Interval between Group D and Group C

Table 2

In comparison of SBP at various intervals between Group D and Group C, all the p values were statistically significant. Whereas the pre-operative mean SBP in group D was 123.33 ± 14.15 and that in group C was 125.94 ± 11.45 the difference was not statistically significant with p value 0.244.

Study Parameter	Group D				Group C				Unpaired T Test	p Value
	Mean	SD	Median	IQR	Mean	SD	Median	IQR		
Pre-operative PR	82.10	2.11	83.00	4.00	82.63	3.86	82.00	6.00	-0.659	0.513
5 min after Dex bolus	79.73	8.45	79.50	4.00	84.06	4.10	84.00	8.00	-2.592	0.012
10 min after Dex bolus	77.93	8.50	77.00	6.00	84.22	3.49	84.50	6.00	-3.852	0.001
At induction	61.93	3.81	61.00	4.00	67.69	3.58	68.00	3.00	-6.129	0.001
After intubation	78.03	5.59	79.00	10.00	87.41	1.78	87.00	2.00	-9.022	0.001
Position	79.27	6.29	80.50	5.00	83.63	8.23	85.00	17.00	-2.036	0.023
At incision	75.10	10.81	80.00	18.00	88.94	6.27	89.50	6.50	-6.213	0.001
15 min	78.53	8.57	80.00	9.00	84.72	11.64	82.50	19.00	-2.077	0.021
30 min	70.53	10.93	70.00	20.00	76.22	6.72	78.00	11.00	-2.485	0.016
45 min	64.20	9.55	60.50	12.00	76.00	6.69	76.00	9.50	-5.666	0.001
60 min	60.80	7.36	59.50	14.00	76.38	5.99	77.00	9.00	-9.166	0.001
75 min	60.30	7.64	60.00	7.00	77.97	6.45	78.50	7.50	-9.857	0.001
90 min	60.30	5.47	59.50	9.00	77.50	6.48	76.00	8.50	-11.264	0.001
105 min	59.50	4.45	59.00	8.00	78.69	4.24	79.00	6.00	-17.395	0.001
120 min	59.27	4.40	58.50	8.00	79.78	4.78	80.00	4.00	-17.537	0.001
135 min	59.97	5.26	61.50	6.00	80.22	2.37	80.00	1.00	-19.754	0.001
150 min	59.63	5.19	60.50	9.00	81.00	2.91	80.00	3.50	-20.166	0.001
165 min	60.53	6.60	60.00	8.00	80.56	3.42	80.00	5.00	-15.152	0.001
180 min	58.93	4.26	60.00	6.00	81.09	5.19	80.50	7.00	-18.312	0.001
At skin closure	60.00	5.84	60.00	7.00	84.09	4.30	84.50	7.00	-18.577	0.001
Supining the patient	60.83	8.86	59.50	8.00	80.75	6.40	84.00	11.00	-10.194	0.001
Reversal	78.60	7.22	78.00	13.00	87.53	5.70	87.00	5.50	-5.422	0.001
Extubation PR	86.93	7.78	85.00	13.00	92.16	7.22	92.00	11.50	-2.743	0.001
Comparison of DBP at Various Interval between Group D and Group C										
<i>Table 3</i>										

In comparison of DBP at various intervals between Group D and Group C, all the p values were statistically significant. Whereas the pre-operative mean DBP was 82.10 ± 2.11 mm of Hg and 82.63 ± 3.86 mm of Hg in Group D and Group C respectively. The difference was not statistically significant p value 0.513.

Study Parameter	Group D				Group C				Unpaired T Test	p Value
	Mean	SD	Median	IQR	Mean	SD	Median	IQR		
Pre-operative PR	95.73	2.60	97.00	5.00	97.5	6.53	96.50	9.00	-1.382	0.172
5 min after Dex bolus	95.09	10.82	92.83	6.00	100.84	5.72	99.67	9.00	-2.369	0.011
10 min after Dex bolus	90.63	12.36	88.00	5.00	97.81	5.13	96.00	8.00	-3.021	0.004
At induction	73.17	4.58	71.50	4.00	79.78	4.25	80.00	6.00	-5.900	0.001
After intubation	95.77	4.67	96.50	7.00	105.28	1.59	105.00	1.00	-10.885	0.001
Position	96.3	4.59	97.50	7.00	91.19	9.33	92.50	14.50	2.709	0.009
At incision	88.83	13.61	96.00	25.00	105.31	7.06	106.50	4.50	-6.040	0.001
15 min	93.34	9.45	94.83	11.00	100.89	14.99	95.33	29.00	-2.058	0.022
30 min	80.57	10.41	79.00	18.00	86.81	4.88	88.17	9.50	-2.810	0.003
45 min	77.03	8.18	74.50	10.00	86.5	4.79	86.50	7.00	-5.606	0.001
60 min	74.23	5.62	73.00	7.00	86.72	4.30	87.00	7.00	-9.853	0.001
75 min	72.57	4.99	73.00	8.00	87.94	4.93	88.00	5.50	-12.190	0.001
90 min	72.97	4.80	72.00	7.00	88	6.58	86.50	7.00	-10.223	0.001
105 min	71.93	3.44	71.50	5.00	87.78	3.85	89.00	5.50	-17.043	0.001
120 min	72.13	3.51	72.50	6.00	89.72	4.61	90.00	3.00	-16.816	0.001

135 min	72.27	4.81	72.50	7.00	89.69	2.13	89.00	1.50	-18.648	0.001
150 min	72.2	5.93	72.00	9.00	90.13	2.34	90.00	3.50	-15.836	0.001
165 min	71.7	3.89	72.50	5.00	90.06	2.58	90.00	3.50	-22.052	0.001
180 min	71.53	3.46	72.00	6.00	93	6.47	91.00	7.50	-16.130	0.001
At skin closure	72.53	4.29	72.00	4.00	97.81	6.45	96.50	9.50	-18.049	0.001
Supining the patient	73.37	8.98	71.50	5.00	93.44	6.46	94.00	11.00	-10.153	0.001
Reversal	91.47	7.25	94.00	13.00	103.03	5.49	102.50	8.00	-7.109	0.001
Extubation PR	102.43	6.65	103.00	10.00	111.13	5.31	113.00	6.00	-5.707	0.001
Comparison of MAP at Various Interval between Group D and Group C										
<i>Table 4</i>										

In comparison of MAP at various intervals between Group D and Group C, all the p values were statistically significant. Whereas the pre-operative mean MAP in group D patients was 95.73 ± 2.60 mm of Hg and that in group C patients was 97.50 ± 6.53 mm of Hg there is no significant difference in mean MAP between two groups (p value 0.172).

DISCUSSION

Heart rate, systolic blood pressure (SBP), diastolic blood pressure (DBP), mean arterial pressure (MAP) were recorded preoperatively, 5 min after the bolus has been started, at 10 min from the start of bolus, at induction, at intubation, at positioning at incision then every 15 min interval till the closure of the skin, at reversal, at extubation.

COMPARISON OF HEART RATE BETWEEN GROUP D AND GROUP C

The mean HR at pre-op in group D was 79.83 ± 8.92 bpm and in group C was 76.67 ± 8.78 bpm. The difference in mean was not statistically significant (p value 0.208).

The mean HR at 5 min after the start of bolus in group D was 75.53 ± 7.66 bpm and in group C was 82.03 ± 9.05 bpm the difference in the mean HR was statistically significant (p value 0.003).

The mean HR at 10 min after the start of bolus in group D was 71.40 ± 8.66 bpm and in group C was 80.13 ± 8.10 bpm. The difference in the mean HR was statically significant with p value < 0.001.

At induction, the mean HR in group D was 60.70 ± 8.44 bpm and that in group C was 70.59 ± 8.15 bpm. As compared to group C in group D, HR was low and difference was statistically significant with p value < 0.001.

At intubation, the mean HR in group D was 80.10 ± 5.89 bpm and that in group C was 108.53 ± 4.57 bpm as compared to group C in group D HR was low and the difference in mean HR was statistically significant with p value < 0.001.

At positioning, that is after turning the patient prone, the mean HR in group D was 79.83 ± 6.82 bpm and that in group C was 90.25 ± 12.32 bpm. As compared to group C, the HR was low in group D and the difference was statistically significant with p value < 0.001.

At incision, the mean HR in group D was 81.63 ± 14.74 bpm and that in group C was 108.91 ± 7.99 . The mean HR in group D was low compared to group C and the difference in HR was statistically significant with p value < 0.001.

After the incision, the HR was recorded at every 15 min till the skin closure. The mean HR was comparable between two groups and the difference was statistically significant with p value < 0.001.

At reversal, the mean HR in group D was 88.73 ± 6.24 bpm and that in group C was 94.31 ± 6.21 bpm. The difference in mean HR was statistically significant with p value < 0.001.

At extubation, the mean HR in group D was 102.07 ± 4.75 bpm and that in group C was 117.56 ± 6.77 bpm. The mean HR in group D was low as compared to group C and the difference was statistically significant with p value < 0.001.

This suggests that dexmedetomidine infusion in group D attenuates the extubation response in terms of reducing the HR during extubation.

Pekkatalke, Richardchean, Brian Thomas et al^[4] studied the hemodynamic and adrenergic effects of perioperative dexmedetomidine infusion after vascular surgery. In this study, patients scheduled for vascular surgery received either dexmedetomidine (n = 22) or placebo (n = 19) I v beginning 20 min before the induction of anaesthesia and continuing it until 48 hr after the end of surgery. They found that, during emergence from anaesthesia, HR was slower with dexmedetomidine 73 ± 11 bpm than placebo 83 ± 20 (p = 0.006) and the percentage of time the heart was within the predetermined haemodynamic limits was more frequent with dexmedetomidine p < 0.05. So, they conclude that dexmedetomidine attenuates increase in heart rate and plasma norepinephrine during emergence from anaesthesia.

In the present study, the mean HR during extubation in group D was 102.07 ± 4.75 bpm and 117.56 ± 6.77 bpm in group C. So, the mean HR was lower in group D as compared to group C with p value < 0.001. This observation of the present study is in concurrence with the above mentioned study.^[4]

COMPARISON OF SBP BETWEEN GROUP D AND GROUP C

Pre-op mean SBP in group D was 123.33 ± 4.15 mmHg and that in group C was 125 ± 11.45 mmHg. The difference in mean SBP between two groups was not significant (p value 0.244).

At 5 min from initiation of the bolus, the mean SBP in group D was 125.80 ± 20.91 mm of Hg and that in group C was 134.41 ± 10.15 mm of Hg. The difference in mean SBP between two groups was statistically significant with p value 0.042.

At 10 min from initiation of the bolus, the mean SBP in group D was 118.17 ± 19.03 mm of Hg that in group C was 126.19 ± 9.68 mm of Hg. The difference in mean SBP was statistically significant with p value 0.039.

At induction, the mean SBP in group D was 95.50 ± 7.46 mm of Hg and that in group C was 105.13 ± 6.03 mm of Hg. There was statistically significant difference in the mean SBP between both the groups p value < 0.001.

At intubation, the mean SBP in group D was $131.27 \pm .34$ mm of Hg and that in group C was 141 ± 3.05 mm of Hg. The mean SBP in group D was less compared to group C. The difference was statistically significant with p value < 0.001.

At positioning, the mean SBP in group D was 131.13 ± 5.59 mm of Hg and that in group C was 145 ± 7.12 mm of Hg. The difference in mean SBP was statistically significant p value < 0.001.

At incision, the mean SBP in group D was 115 ± 19.94 mm of Hg and that in group C was 138.41 ± 12.31 mm of Hg. The mean SBP in group D was low and statistically significant with p value < 0.001.

After the incision, SBP was recorded at every 15 min until the closure of the skin and repositioning of the patient. There was statistically significant difference in the mean SBP with p value 0.001.

At reversal, the mean SBP in group D was 115.50 ± 8.93 mm of Hg and that in group C was 133.68 ± 9.98 mm of Hg. There was statistically significant difference in the mean SBP between two groups with p value 0.001.

At extubation, the mean SBP in group D was 134.10 ± 8.25 mm and that in group C was 153.44 ± 5.75 mm of Hg. The mean SBP in group D was low compared to group C and the difference was statistically significant with p value < 0.001.

Bekker et al. neuroanesthesiology research report^[5] studied the effects of dexmedetomidine on perioperative haemodynamics in patients undergoing craniotomy were randomly assigned into two groups; one group received sevoflurane with opioid and the other group received sevoflurane, opioid plus dexmedetomidine. They found from the study that dexmedetomidine

infusion was effective in blunting increase in the SBP intra-operatively. The use of dexmedetomidine did not increase the incidence of bradycardia and hypotension. In the present study also, the SBP was low in group D throughout the intraoperative period. This observation of the present study is in concurrence with the above mentioned study.

COMPARISON OF DBP BETWEEN GROUP D AND GROUP C

The mean DBP in group D was low compared to group C entire period from 5 min after infusion to extubation of the patient with p value < 0.001.

COMPARISON OF MAP BETWEEN GROUP D AND GROUP C

The pre op mean MAP in group D was 95.73 ± 2.3 mm of Hg and that in group C was 97.50 ± 6.53 mm of Hg. There is no significant difference in the mean MAP between the above two groups (p value 0.172).

At 5 min from start of bolus, the mean MAP in group D was 95.09 ± 10.82 mm of Hg and that in group C was 100.84 ± 5.72 mm of Hg. The difference in the mean was statistically significant with p value < 0.001.

At 10 min from the start of bolus, the mean MAP in group D was 90.63 ± 12.36 mm of Hg and that in group C was 97.81 ± 5.13 mm of Hg. The difference in the MAP was statistically significant with p value 0.001.

At induction, the mean MAP in group D was 73.17 ± 4.58 mm of Hg and that in group C was 79.78 ± 4.25 mm of Hg. The difference in mean was statistically significant with p value < 0.001.

At intubation, the mean MAP in group D was 96.77 ± 4.7 mm of Hg and that in group C was 105.28 ± 1.59 mm of Hg. The difference in the mean MAP was statistically significant with p value < 0.001.

There was statistically significant difference in the mean MAP between group D and group C during positioning and intraoperative period.

At reversal, the mean MAP in group D was 91.47 ± 4.25 mm of Hg and that in group C was 103.03 ± 5.49 mm of Hg. The difference in mean MAP was statistically significant with p value < 0.001.

At extubation, the mean MAP in group D was 102.43 ± 6.65 mm of Hg and that in group C was 111.13 ± 5.31 mm of Hg. The difference in mean MAP was statistically significant with p value < 0.001.

Yildiz et al.^[6] studied the effects of dexmedetomidine on hemodynamic responses to laryngoscopy and intubation, perioperative hemodynamic and anaesthetic requirements. 50 patients posted for minor surgery were randomly assigned in to DEX (n = 25) and placebo (n = 25). During intubation, the need for thiopental and fentanyl was decreased by 39 % and 92 % respectively in the DEX group compared to placebo group. Increase in HR and blood pressure was significantly lower in DEX group compared to placebo (p < 0.05) fentanyl requirement during operation was 74.20 ± 10.53 µgm in DEX group and that in placebo group 84 ± 27 µgm (p = 0.005). They concluded from the study that preoperative single dose of dexmedetomidine administration resulted in progressive increase in sedation and blunted hemodynamic responses during laryngoscopy and intubation reduced opioid and anaesthetic requirements. Furthermore, dexmedetomidine decreased the post-operative blood pressure, heart rate and recovery time.

In the present study also, dexmedetomidine infusion in group D decreased the HR and blood pressure during intubation as compared to placebo. This observation of the present study is in concurrence with above mentioned study.

Yasser M El-Halafawy, Hala M El-Kerdawy, et al,^[7] studied effects of dexmedetomidine in morbidly obese patients undergoing laparoscopic gastric bypass. In this study, 80 adult

patients scheduled for elective laparoscopic roux en y gastric bypass surgery were randomly assigned to one of the two study groups; In Group D, 40 patients received dexmedetomidine (0.8 µgm/kg bolus then infusion 0.4 µgm/kg and group p patients received normal saline in the same volume and rate. They found that patients who received dexmedetomidine showed significant decrease of intra operative and post-operative mean blood pressure and heart rate. They concluded that the intraoperative infusion of dexmedetomidine offered better control of all the hemodynamic parameters.

In the present study, HR and MAP were less in group D compared to group C from the starting of bolus to extubation with significant difference in their mean results which are in concurrence with the above mentioned studies.^[6,7]

CONCLUSION

Dexmedetomidine provides good intra-operative hemodynamic stability in spine surgeries. The incidence of bradycardia and hypotension were less with the dexmedetomidine in prone position.

Contribution of authors

First author involved in study design, data collection, data analysis.

Second author involved in technical aspect and data analysis

Third author involved in study editing and technical aspect

Forth author is corresponding author involved in study draft.

REFERENCES

1. Mohamed HS, Asida SM, Salman OH. Dexmedetomidine versus nimodipine for controlled hypotension during spine surgery. *Egyptian J Anaesth* 2013;29(4):325-31.
2. Yokoyama M, Ueda W, Hirakawa M, Yamamoto H. Hemodynamic effect of the prone position during anesthesia. *Acta Anaesthesiol Scand* 1991;35(8):741-4.
3. Toyota S, Amaki Y. Hemodynamic evaluation of the prone position by transesophageal echocardiography. *J Clin Anesth* 1998;10(1):32-5.
4. Talke P, Chen R, Thomas B, Aggarwall A, Gottlieb A, Thorborg P, et al. The hemodynamic and adrenergic effects of perioperative dexmedetomidine infusion after vascular surgery. *Anesth Analg* 2000;90(4):834-9.
5. Bekker A, Sturaitis M, Bloom M, Moric M, Golfinos J, Parker E, et al. The effect of dexmedetomidine on perioperative hemodynamics in patients undergoing craniotomy. *Anesth Analg* 2008;107(4):1340-7.
6. Yildiz M, Tavlan A, Tuncer S, Reisli R, Yosunkaya A, Otelcioglu S. Effect of dexmedetomidine on haemodynamic responses to laryngoscopy and intubation. *Drugs in R & D* 2006;7(1):43-52.
7. Bakhamees HS, El-Halafawy YM, El-Kerdawy HM, Gouda NM, Altemyatt S. Effects of dexmedetomidine in morbidly obese patients undergoing laparoscopic gastric bypass. *Middle East J Anaesthesiol* 2007;19(3):537-51.