

RESULTS

This part of study include 40 patients, divided into two groups:

Group I: Control (bupivacine) group, that received 12 mg heavy bupivacine.

Group II: Dexmedetomidine group, that received 12 mg heavy bupivacine + 3ug dexmedetomidine.

There were insignificant difference between the two groups regarding demographic data and duration of surgery as shown in:

Table (5): Comparison between Spinal dexmedetomidine group & Spinal control group as regards.

		N	Mean	Std. Deviation	t	p			
Age	Spinal dexmedetomidine group	20	69.60	4.871	0.8	>0.05			
	Spinal control group	20	71.10	6.537					
wt	Spinal dexmedetomidine group	20	81.25	6.008	4.4	<0.05			
	Spinal control group	20	73.35	5.214					
height	Spinal dexmedetomidine group	20	169.05	5.186	0.9	>0.05			
	Spinal control group	20	167.45	5.726					
Duration of surgery	Spinal dexmedetomidine group	20	54.45	11.596	0.3	>0.05			
	Spinal control group	20	55.45	13.406					
	Spinal dexmedetomidine group		Spinal control group		Total		X ²	p	
		No.	%	No.	%	No.			%
ASA	I	5	25.0%	4	20.0%	9	22.5%	0.2	>0.05
	II	11	55.0%	12	60.0%	23	57.5%		
	III	4	20.0%	4	20.0%	8	20.0%		
	Total	20	100.0%	20	100.0%	40	100.0%		

The spinal technique was easy in all patients and recovery from spinal block was uneventful. The median and range of peak sensory level reached were T₆ (T₄-T₁₀) in bupivacaine group, T₆ (T₂-T₁₀) in dexmedetomidine group, without significant difference between two groups. The regression times of two dermatomes and the regression times to S₁ segment were significantly different between two groups as shown in Table (6).

Table (6): Comparison between Spinal dexmedetomidine group & Spinal control group as regards.

		N	Mean	Std. Deviation	t	p
Sensory regression of 2 dermatome	Spinal dexmedetomidine group	20	115.50	22.791	6.6	<0.001
	Spinal control group	20	73.30	17.177		
sensory regression to S1 segment	Spinal dexmedetomidine group	20	285.80	54.297	8.3	<0.001
	Spinal control group	20	172.55	27.961		
regression to bromage 0	Spinal dexmedetomidine group	20	250.90	53.836	7.4	<0.001
	Spinal control group	20	150.40	28.417		

All patients achieved Bromage 3 motor block. However, the time to reach Bromage 3 motor block was significantly shorter in dex. Group (13.2 ± 5.6 min) than in bupivacaine group (20.7 ± 10.3 min, $P = 0.002$). The regression time to Bromage 0 was significantly different between two groups as shown in Table (2).

The mean values of MAP and H.R were comparable between the two groups throughout the intra-and post-operative periods as shown in following tables (7 & 8) and Figures (14).

Table (7): Comparison between Spinal dexmedetomidine group & Spinal control group as regards.

		N	Mean	Std. Deviation	t	p
MAP0	Spinal dexmedetomidine group	20	89.65	4.660	2.1	<0.05
	Spinal control group	20	86.40	5.195		
MAP15	Spinal dexmedetomidine group	20	77.55	7.681	1.4	>0.05
	Spinal control group	20	73.85	9.247		
MAP30	Spinal dexmedetomidine group	20	75.65	6.158	1.7	>0.05
	Spinal control group	20	78.60	5.103		
MAP45	Spinal dexmedetomidine group	20	74.95	5.615	1.6	>0.05
	Spinal control group	20	77.80	5.376		
MAP1h	Spinal dexmedetomidine group	20	72.95	4.582	3.2	<0.05
	Spinal control group	20	77.85	5.234		
MAP1.5 h	Spinal dexmedetomidine group	20	71.45	4.148	3.9	<0.05
	Spinal control group	20	77.25	5.200		
MAP2h	Spinal dexmedetomidine group	20	71.75	3.683	4.9	<0.05
	Spinal control group	20	79.15	5.631		
MAP2/5h	Spinal dexmedetomidine group	20	73.30	4.079	3.9	<0.05
	Spinal control group	20	80.75	7.594		
MAP3h	Spinal dexmedetomidine group	20	73.15	4.475	6.6	<0.05
	Spinal control group	20	86.40	7.857		
MAP3.5 h	Spinal dexmedetomidine group	20	76.10	5.656	2.3	<0.05
	Spinal control group	20	80.40	6.286		
MAP4h	Spinal dexmedetomidine group	20	79.60	4.512	1.5	>0.05
	Spinal control group	20	82.00	5.675		
MAP4.5h	Spinal dexmedetomidine group	20	80.70	4.269	0.8	>0.05
	Spinal control group	20	81.85	4.923		

Table (8): Comparison between Spinal dexmedetomidine group & Spinal control group as regards:

		N	Mean	Std. Deviation	t	p
H.R0	Spinal dexmedetomidine group	20	73.35	2.907	5.1	<0.001
	Spinal control group	20	68.45	3.187		
H.R15	Spinal dexmedetomidine group	20	72.25	3.385	2.9	<0.05
	Spinal control group	20	68.45	4.904		
H.R30	Spinal dexmedetomidine group	20	69.55	2.704	1.5	>0.05
	Spinal control group	20	68.10	3.447		
H.R45	Spinal dexmedetomidine group	20	70.10	3.007	4.8	<0.05
	Spinal control group	20	65.25	3.275		
H.R1h	Spinal dexmedetomidine group	20	68.40	2.703	4.3	<0.05
	Spinal control group	20	64.15	3.453		
H.R1.5 h	Spinal dexmedetomidine group	20	62.39	13.340	0.1	>0.05
	Spinal control group	20	62.70	3.045		
H.R2h	Spinal dexmedetomidine group	20	66.45	2.724	4.5	<0.05
	Spinal control group	20	62.15	3.281		
H.R2.5h	Spinal dexmedetomidine group	20	65.45	2.645	3.9	<0.05
	Spinal control group	20	61.40	3.691		
H.R3h	Spinal dexmedetomidine group	20	64.70	2.812	3.7	<0.05
	Spinal control group	20	60.70	3.922		
H.R3.5 h	Spinal dexmedetomidine group	20	61.10	3.782	3.2	<0.05
	Spinal control group	20	64.70	3.435		
H.R4h	Spinal dexmedetomidine group	20	60.90	2.532	4.3	<0.05
	Spinal control group	20	64.70	2.993		
H.R4.5h	Spinal dexmedetomidine group	20	62.20	2.285	3.5	<0.05
	Spinal control group	20	65.05	2.856		

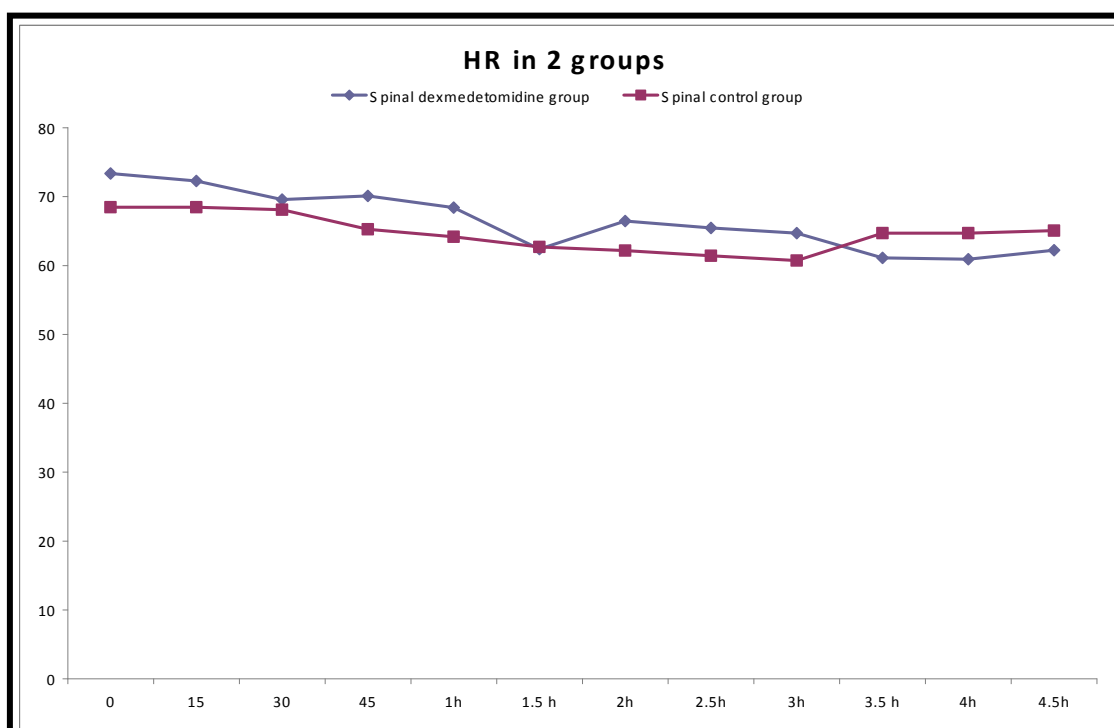
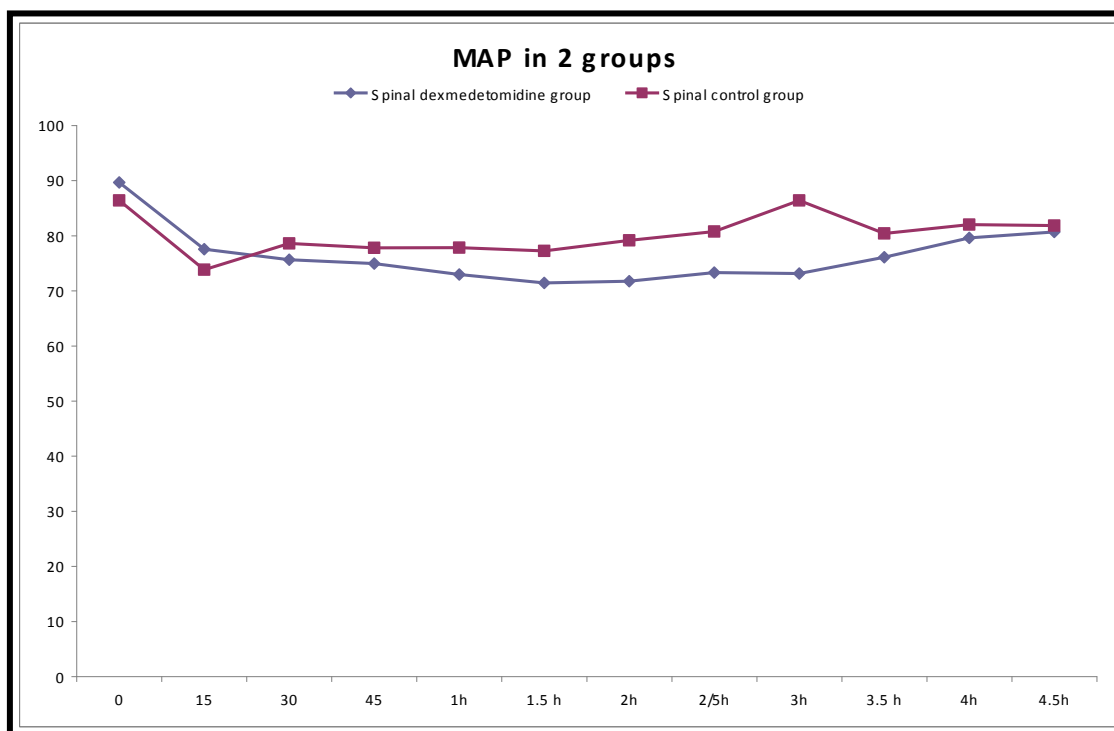


Fig. (14)

All patients had a peripheral oxygen saturation greater than 96% at all times and didn't require additional oxygen in the PACU as shown in Table (9).

Table (9): Comparison between Spinal dexmedetomidine group & Spinal control group as regards

		N	Mean	Std. Deviation	t	p
Pulse oximeter0	Spinal dexmedetomidine group	20	96.55	.826	4.7	<0.05
	Spinal control group	20	98.10	1.210		
Pulse oximeter15	Spinal dexmedetomidine group	20	99.25	.716	1.8	>0.05
	Spinal control group	20	98.85	.671		
Pulse oximeter30	Spinal dexmedetomidine group	20	99.35	.745	2.2	<0.05
	Spinal control group	20	98.90	.553		
Pulse oximeter45	Spinal dexmedetomidine group	20	99.10	.553	2.01	>0.05
	Spinal control group	20	98.75	.550		
Pulse oximeter1h	Spinal dexmedetomidine group	20	98.35	1.089	0.3	>0.05
	Spinal control group	20	98.45	1.146		
Pulse oximeter1.5 h	Spinal dexmedetomidine group	20	97.30	1.081	0.1	>0.05
	Spinal control group	20	97.25	1.251		
Pulse oximeter2h	Spinal dexmedetomidine group	20	97.05	.759	0.4	>0.05
	Spinal control group	20	96.95	.759		
Pulse oximeter2.5h	Spinal dexmedetomidine group	20	96.65	.587	0.6	>0.05
	Spinal control group	20	96.75	.550		
Pulse oximeter3h	Spinal dexmedetomidine group	20	96.65	.671	1.003	>0.05
	Spinal control group	20	96.85	.587		
Pulse oximeter3.5 h	Spinal dexmedetomidine group	20	96.55	.826	0.7	>0.05
	Spinal control group	20	96.70	.470		
Pulse oximeter4h	Spinal dexmedetomidine group	20	96.75	.910	0.4	>0.05
	Spinal control group	20	96.65	.489		
Pulse oximeter4.5h	Spinal dexmedetomidine group	20	96.50	1.051	0.6	>0.05
	Spinal control group	20	96.65	.587		

No sedation in bupivacaine group and level of sedation scores were in the range of 0 – 3 in dexmedetomidine group as shown in following tables (10).

Table (10): Frequency of degree of sedation in Spinal dexmedetomidine group.

level of sedation	0	15	30	45	1h	1.5 h	2h	2.5h	3h	3.5 h	4h	4.5h
0	20			5	15	20	20	20	20	20	20	20
1		5										
2		10	10	10	4							
3		5	10	5	1							

Table (11): Frequency of degree of sedation in Spinal control group

	0	15	30	45	1h	1.5 h	2h	2.5h	3h	3.5 h	4h	4.5h
0	20	20	20	20	20	20	20	20	20	20	20	20

The mean of VAS values were less in dexmedetomidine group than in bupivacaine group, with decrease in analgesic requirement in post-operative period as shown in table (12).

Table (12): Comparison between Spinal dexmedetomidine group & Spinal control group as regards.

		N	Mean	Std. Deviation	t	p
VAS	Spinal dexmedetomidine group	20	20.250%	7.1589%	9.4	<0.001
	Spinal control group	20	41.500%	7.0897%		

No patients required atropine, three patients in bupivacine group and two in dexmedetomidine group received one dose of ephedrine, only one patient in bupivacine group developed shivering and received 25 mg pethidine intravenous (13) .

Table (13): Comparison between Spinal dexmedetomidine group & Spinal control group as regards.

		Spinal dexmedetomidine group		Spinal control group		Total		X ²	P
		No.	%	No.	%	No.	%		
Complications	No	18	90.0%	16	80.0%	34	85.0%	0.8	>0.05
	Yes	2	10.0%	4	20.0%	6	15.0%		
	Total	20	100.0%	20	100.0%	40	100.0%		

The second part of study include also fourty patients, did surgical repair of abdominal hernia under epidural anesthesia, they divided into two groups.

Group I: Control (bupivacine) group : they received 20 ml of bupivacine 0.5%.

Group II: dexmedetomidine group : They received 20 ml of bupivacine 0.5% + 1 ug/kg of dexmedetomidine.

There were no significant difference between two groups regarding demographic data and duration of surgery as shown in Table (14).

Table (14): Comparison between Epidural dexmedetomidine group & Epidural control group as regards.

				N	Mean	Std. Deviation	t	p	
Age	Epidural dexmedetomidine group			20	44.75	13.580	0.3	>0.05	
	Epidural control group			20	43.15	15.360			
Wt	Epidural dexmedetomidine group			20	91.75	14.205	1.2	>0.05	
	Epidural control group			20	85.75	16.635			
height	Epidural dexmedetomidine group			20	177.85	8.928	1.1	>0.05	
	Epidural control group			20	174.20	11.923			
Duration of surgery	Epidural dexmedetomidine group			20	141.75	40.434	0.9	>0.05	
	Epidural control group			20	130.00	34.451			
		Epidural Dexmedetomidine group		Epidural Control Group		Total		X ²	p
		No.	%	No.	%	No.	%		
ASA	I	6	30.0%	8	40.0%	14	35.0%	0.1	>0.05
	II	14	70.0%	12	60.0%	26	65.0%		
	Total	20	100.0%	20	100.0%	40	100.0%		

The puncture level was L1-2 (20%), L2-3 (75%) and L3-4 (5%) and maximum sensory level achieved T10 (2 patients), T8 (5 patients), T7 (5 patients), T6 (16 patients), T5 (12patients), regarding the lag time and elapsed time to block T12,10,8 there were no significant difference between two groups, but there were significant difference between two groups regarding the mean duration of the dose as shown in following tables (15, 16, 17).

Table (15): Comparison between Epidural dexmedetomidine group & Epidural control group as regards

		N	Mean	Std. Deviation	t	p
Lagetime	Epidural dexmedetomidine group	20	4.670	.8572	2.5	<0.05
	Epidural control group	20	5.350	.8127		
time toblack T12	Epidural dexmedetomidine group	20	8.10	2.813	2.8	<0.05
	Epidural control group	20	10.25	1.957		
time toblack T10	Epidural dexmedetomidine group	20	18.94	3.281	3.2	<0.05
	Epidural control group	20	15.98	2.495		
time toblack T8	Epidural dexmedetomidine group		23.68	3.027	0.6	>0.05
	Epidural control group		24.32	3.693		
Bolus	Epidural dexmedetomidine group		133.25	59.211	5.1	<0.05
	Epidural control group		63.00	15.761		

Table (16): Comparison between Epidural dexmedetomidine group & Epidural control group as regards

		Epidural Dexmedetomidine group		Epidural Control Group		Total	
		No.	%	No.	%	No.	%
max. sensory level	T10	0	.0%	2	10.0%	2	5.0%
	T5	12	60.0%	0	.0%	12	30.0%
	T6	8	40.0%	8	40.0%	16	40.0%
	T7	0	.0%	5	25.0%	5	12.5%
	T8	0	.0%	5	25.0%	5	12.5%
	Total	20	100.0%	20	100.0%	40	100.0%

Table (17): Comparison between Epidural dexmedetomidine group & Epidural control group as regards.

		Epidural Dexmedetomidine group		Epidural Control Group		Total		X ²	p
		No.	%	No.	%	No.	%		
site of insertion	L1-2	0	.0%	8	40.0%	8	20.0%	11.2	<0.05
	L2-3	18	90.0%	12	60.0%	30	75.0%		
	L3-4	2	10.0%	0	.0%	2	5.0%		
	Total	20	100.0%	20	100.0%	40	100.0%		

Motor block strength evaluated by Bromage scale and duration of motor block was more pronounced in dexmedetomidine group than control group as shown in tables (18, 19).

Table (18): Frequency of degree of motor block measured by Bromage Scale of Epidural dexmedetomidine group

Bromage Scale	0	5	10	15	30	60	90	120	150	180	210	240
0	20	10						4	9	20	20	20
1		8	8									
2		2	9	8	2	2	2	2	5			
3			3	12	18	18	18	14	6			

Table (19): Frequency of degree of motor block measured by Bromage Scale of Epidural control group

Bromage Scale	0	5	10	15	30	60	90	120	150	180	210	240
0	20	10	4				8	16	20	20	20	20
1		5	6	4	2							
2		5	5	7	2	2	2	1				
3			5	9	16	18	10	3				

The mean values of mean arterial pressure (MAP), HR and pulse oximeter were comparable between two groups during intra and post operative periods as shown in following tables (20, 21, 22) and figures(15).

Table (20): Comparison between Epidural dexmedetomidine group & Epidural control group as regards.

		N	Mean	Std. Deviation	t	p
MAP0	Epidural Dexmedetomidine group	20	88.75	11.383	0.5	>0.05
	Epidural Control Group	20	90.00	3.798		
MAP5	Epidural Dexmedetomidine group	20	80.40	4.285	0.4	>0.05
	Epidural Control Group	20	80.90	4.506		
MAP10	Epidural Dexmedetomidine group	20	79.40	3.885	1.2	>0.05
	Epidural Control Group	20	81.05	4.454		
MAP15	Epidural Dexmedetomidine group	20	74.90	6.121	2.5	<0.05
	Epidural Control Group	20	79.45	5.155		
MAP30	Epidural Dexmedetomidine group	20	73.95	5.165	1.4	>0.05
	Epidural Control Group	20	77.35	9.144		
MAP60	Epidural Dexmedetomidine group	20	72.75	4.564	3.7	<0.05
	Epidural Control Group	20	78.50	5.366		
MAP90	Epidural Dexmedetomidine group	20	72.15	3.815	5.4	<0.05
	Epidural Control Group	20	79.35	4.603		
MAP120	Epidural Dexmedetomidine group	20	72.30	4.485	5.3	<0.05
	Epidural Control Group	20	79.45	4.058		
MAP150	Epidural Dexmedetomidine group	20	76.35	5.019	3.8	<0.05
	Epidural Control Group	20	82.75	5.514		
MAP180	Epidural Dexmedetomidine group	20	83.15	5.824	0.2	>0.05
	Epidural Control Group	20	83.50	3.620		
MAP210	Epidural Dexmedetomidine group	20	84.35	4.158	0.2	>0.05
	Epidural Control Group	20	84.60	2.780		
MAP240	Epidural Dexmedetomidine group	20	85.90	3.810	0.2	>0.05
	Epidural Control Group	20	85.65	2.925		

Table (21): Comparison between Epidural dexmedetomidine group & Epidural control group as regards

		N	Mean	Std. Deviation	t	p
Pulse0	Epidural Dexmedetomidine group	20	74.50	2.544	1.8	>0.05
	Epidural Control Group	20	73.00	2.575		
Pulse5	Epidural Dexmedetomidine group	20	72.65	2.519	0.1	>0.05
	Epidural Control Group	20	72.60	2.703		
Pulse10	Epidural Dexmedetomidine group	20	70.20	2.858	1.5	>0.05
	Epidural Control Group	20	71.60	3.136		
Pulse15	Epidural Dexmedetomidine group	20	66.45	3.348	2.1	<0.05
	Epidural Control Group	20	68.80	3.750		
Pulse30	Epidural Dexmedetomidine group	20	63.80	3.238	4.2	<0.05
	Epidural Control Group	20	68.10	3.243		
Pulse60	Epidural Dexmedetomidine group	20	62.85	2.852	3.6	<0.05
	Epidural Control Group	20	66.20	3.019		
Pulse90	Epidural Dexmedetomidine group	20	63.80	2.840	2.2	<0.05
	Epidural Control Group	20	65.80	3.019		
Pulse120	Epidural Dexmedetomidine group	20	64.30	2.755	0.2	>0.05
	Epidural Control Group	20	64.45	3.220		
Pulse150	Epidural Dexmedetomidine group	20	65.10	2.469	1.6	>0.05
	Epidural Control Group	20	63.60	3.440		
Pulse180	Epidural Dexmedetomidine group	20	65.30	2.940	2.6	<0.05
	Epidural Control Group	20	68.10	3.919		
Pulse210	Epidural Dexmedetomidine group	20	66.40	2.817	2.3	<0.05
	Epidural Control Group	20	68.35	2.621		
Pulse240	Epidural Dexmedetomidine group	20	67.45	2.665	2.2	<0.05
	Epidural Control Group	20	69.35	2.681		

Table (22): Comparison between Epidural dexmedetomidine group & Epidural control group as regards.

		N	Mean	Std. Deviation	t	p
O2sat 0	Epidural Dexmedetomidine group	20	95.50	1.357	0.5	>0.05
	Epidural Control Group	20	95.75	1.682		
O2sat5	Epidural Dexmedetomidine group	20	95.35	1.424	0.8	>0.05
	Epidural Control Group	20	95.75	1.832		
O2sat10	Epidural Dexmedetomidine group	20	95.25	1.682	0.2	>0.05
	Epidural Control Group	20	95.35	1.872		
O2sat15	Epidural Dexmedetomidine group	20	95.45	1.986	1.2	>0.05
	Epidural Control Group	20	93.40	7.221		
O2sat30	Epidural Dexmedetomidine group	20	95.25	2.633	0.6	>0.05
	Epidural Control Group	20	94.70	2.867		
O2sat60	Epidural Dexmedetomidine group	20	95.70	1.809	0.4	>0.05
	Epidural Control Group	20	95.45	1.791		
O2sat90	Epidural Dexmedetomidine group	20	95.30	1.593	0.8	>0.05
	Epidural Control Group	20	95.80	2.142		
O2sat120	Epidural Dexmedetomidine group	20	95.60	1.429	0.1	>0.05
	Epidural Control Group	20	95.65	2.700		
O2sat150	Epidural Dexmedetomidine group	20	95.45	1.276	1.6	>0.05
	Epidural Control Group	20	96.20	1.673		
O2sat180	Epidural Dexmedetomidine group	20	96.00	1.338	1.3	>0.05
	Epidural Control Group	20	96.55	1.317		
O2sat210	Epidural Dexmedetomidine group	20	96.20	1.361	0.8	>0.05
	Epidural Control Group	20	96.55	1.538		
O2sat240	Epidural Dexmedetomidine group	20	96.35	1.531	0.9	>0.05
	Epidural Control Group	19	96.79	1.357		

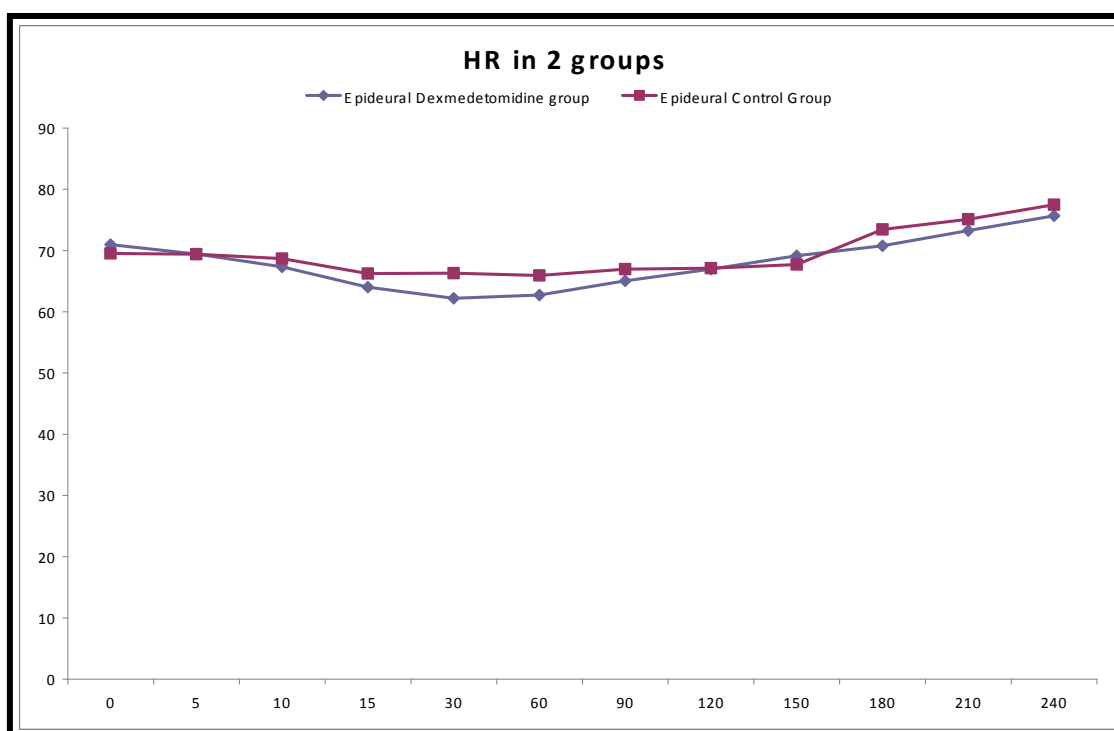
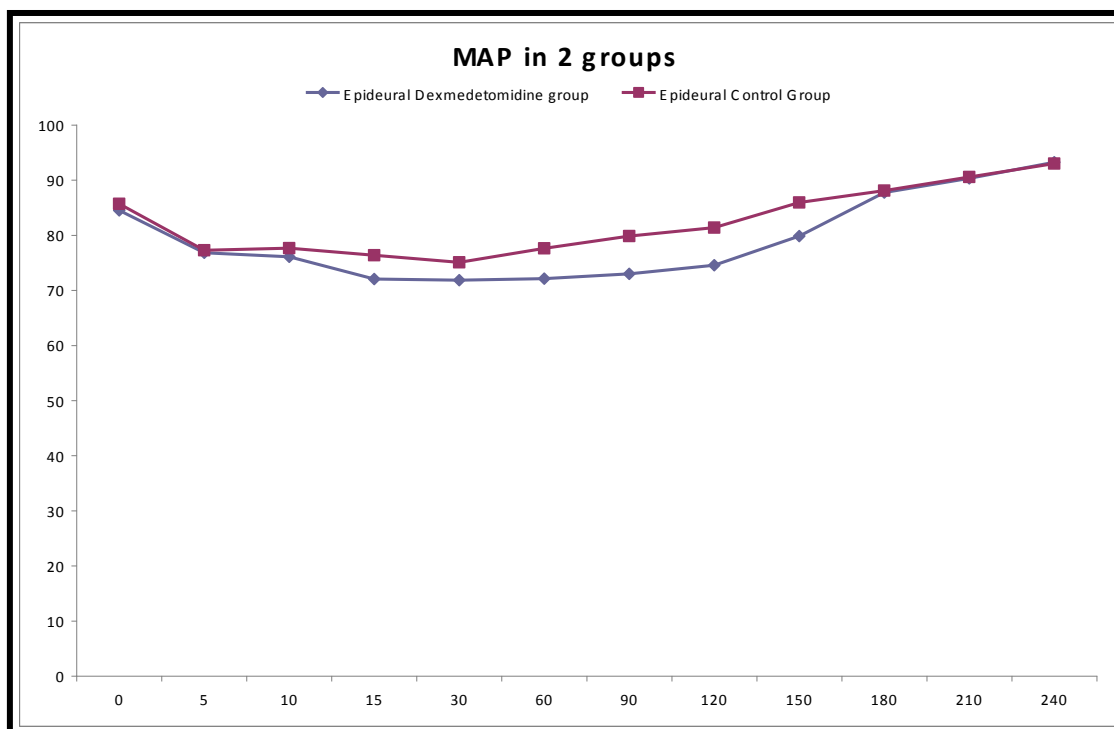


Fig. (15)

The following table show the degree of sedation observed in each patients after epidural administration of dexmedetomidine in total, 15% of them had sedation level of 3 on Ramsay sedation scale within 5 minutes; 80% of them had sedation level of 3-4 on Ramsay scale from 15 to 90 min. Adequate sedation was maintained between 10 and 120 minutes with a single dose.

Table(23):Frequency of degree of sedation in Epidural dexmedetomidine group.

level of sedation	0	5	10	15	30	60	90	120	150	180	210	240
0	20						4	8	16	17	19	19
1		1	1		2	4	1					
2		16	9	2	3	1	3	7	2	2		
3		3	8	10	5	12	9	5	2	1	1	1
4			2	8	10	3	3					
5												

Table (24): Frequency of degree of sedation in Epidural control group

level of sedation	0	5	10	15	30	60	90	120	150	180	210	240
0	20	20	20	20	20	20	20	20	20	20	20	20

The sedation of patients was managed with a single dose of epidural dexmedetomidine, no subsequent dose was administrated. In patients who achieved a sedation level of 2 on Ramsay scale, even with incomplete induction of motor block, it was possible to initiate the surgical procedure. On other hand, complete recovery of motor block was observed after surgery and there were still sedation without pain or discomfort.

The mean values of VAS were less in epidural dexmedetomidine group than epidural control group as shown in Table (25).

Table (25): comparison between Epidural dexmedetomidine group & Epidural control group as regards

		N	Mean	Std. Deviation	t	p
VAS	Epidural Dexmedetomidine group	20	32.25	11.525	6.8	<0.001
	Epidural Control Group	20	59.25	13.502		

No patients required atropine, 3 patients in control group and 2 patient in dexmedetomidine group received single dose of ephedrine, 2 patients in control group and one patient in dexmedetomidine group developed shivering and received 25 mg pethidine intravenous.

Table (26): Comparison between Epidural dexmedetomidine group & Epidural control group as regards

		Epidural Dexmedetomidine group		Epidural Control Group		Total		X ²	p
		No.	%	No.	%	No.	%		
complications	No	17	85.0%	15	75.0%	32	80.0%	0.6	>0.05
	Yes	3	15.0%	5	25.0%	8	20.0%		
	Total	20	100.0%	20	100.0%	40	100.0%		