The effect of dexmedetomidine on the quality of recovery in parturients undergoing elective Caesarean Sections: a Randomized Comparative Study

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Abstract

Effective and adequate post-operative analgesia for cesarean section is in demand as it may help promote recovery and early ambulation. Local nerve block has been applied as post-operative analgesia for patients undergoing cesarean section specifically, lateral abdominal Transversus Abdominis plane block (TAP) under ultrasound guidance have been proven to be effective. The present study aimed to compare the analgesic effect of addition dexmedetomidine intrathecally to the effect of dexmedetomidine in Tap block in CS compared to bupivacaine alone. 150 patients were recruited to undergo cesarean section and divided into three groups; The first group spinal anesthesia was performed with hydrochloride bupivacaine 10-12 mg and TAP block was performed with 30 ml 0.25% bupivacaine in each side and the second group Spinal anesthesia was performed with hydrochloride bupivacaine 10-12 mg and TAP block was performed with 50 mcg Dexmedetomidine added to 30ml 0.25% bupivacaine in each side and the third group Spinal anesthesia was performed with hydrochloride bupivacaine 10-12 mg added to 5 mcg dexmedetomidine and TAP block was performed with 30ml 0.25% bupivacaine in each side. Demographic and clinical data were collected and compared, including time of first request of analgesia in hours, Intraoperative hemodynamics, VAS score during first 24 hours postoperatively, Nausea and vomiting in both intraoperative and postoperative periods, Motor power in both intraoperative and post-operative periods, Sensory level in both intraoperative and post-operative periods, Complications of spinal anesthesia and TAP block during 12 hours post-operative period. Our study showed that the addition of dexmedetomidine to bupivacaine in TAP block has been proved to prolong the duration of time at which first dose of rescue analgesia was sought and also the total dose of opioid requirement in the first 24-h post-Caesarean section was reduced than addition of dexmedetomidine intrathecally and use of bupivacaine alone.

Key words: Dexmedetomidine; Caesarean Sections; Spinal Anesthesia; TAP block.

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INTRODUCTION:

Pain after caesarean section (CS) if not adequately treated affects mother wellbeing, baby bonding, and breastfeeding. Spinal anesthesia is an ideal choice for CS when there is no contraindication for this technique. Spinal anesthesia provides adequate intraoperative anesthesia as well as analgesia in the early postoperative period [(1)]. Bupivacaine has a long duration of action among anesthetics used for the establishment of spinal anesthesia and peripheral nerve block. However, one of its main side effects is its cardiac toxicity which occurs at high doses hence many adjuvants have been added to reduce the required dose and incidence of toxicity as well as improve its analgesic profile [(2)]. Dexmedetomidine is a selective alpha 2 adrenergic agonist with both analgesic and sedative properties. Its use with bupivacaine either intrathecally or in peripheral nerve block associated with prolongation of the local anesthetic effect [(3,4)]. To improve the safety and efficacy of spinal anesthesia during caesarean section, dexmedetomidine is a commonly used adjuvant in anesthesia because it can enhance sedative and analgesic effects and reduce the adverse reactions of anesthesia [(5,6,7)]. Also, the addition of dexmedetomidine to bupivacaine in TAP block prolonged the duration of time at which first dose of rescue analgesia was sought and also reduced the total dose of opioid requirement in the first 24-h post-Caesarean section [(8)]. To our knowledge, there was no research done to compare the analgesic effect of intrathecally added dexmedetomidine to the analgesic effect of dexmedetomidine added to the TAP block for postoperative pain management after CS. So, we conducted this study to compare between the analgesic effect of intrathecally added dexmedetomidine to that of dexmedetomidine when added in TAP block post-CS, and both groups will be

comparable with bupivacaine when used alone intrathecally and in TAP block post-CS.

METHODS:

This randomized clinical trial was performed on 141 females undergoing elective CS in the operation room of Cairo University Obstetrics and Gynecology Hospital after obtaining approval by the Ethics Committee, the anesthesia department's scientific committee and a written informed consent from study participants. Patients were divided into three equal groups, Group (A): spinal anesthesia was performed with hydrochloride bupivacaine 10-12 mg and TAP block was performed with 30 ml 0.25% bupivacaine in each side, Group (B): spinal anesthesia was performed with hydrochloride bupivacaine 10-12 mg and TAP block was performed with 50 mcg Dexmedetomidine added to 30ml 0.25% bupivacaine in each side while Group (C): spinal anesthesia was performed with hydrochloride bupivacaine 10-12 mg added to 5 mcg dexmedetomidine and TAP block was performed with 30ml 0.25% bupivacaine in each side. The ultrasound used was Mindray DP 20 (China) the scanning probe was the linear high frequency 6-13 MHz transducer (L25 x 6-13 MHz linear array). The needle used was the sonoplex needles manufactured by PAJUNK (USA) in case of TAP block and 25 G special spinal needle for spinal anesthesia.

Before arrival to the operation room (OR), women were premedicated by metoclopramide 10mg and ranitidine 50 mg intravenous. Perioperative monitoring included continuous electrocardiogram (ECG), pulse oximetry, non-invasive arterial blood pressure.20G-cannulae was inserted and pre-load infusion of Lactated Ringer's solution (10 mL/Kg) was given. Intra operatively, hemodynamics were recorded baseline before spinal anaesthesia, after its performance, every 5 minutes until delivery and till the end of the CS. Any change in blood pressure or heart rate within 20% of baseline was accepted and any change in systolic blood pressure more than 20% was managed according to guidelines. All groups were anaesthetized to preform CS with conventional spinal anaesthesia in sitting position and the L4-L5 interspace was selected as the location for puncture subarachnoid then hyperbaric bupivacaine with different combinations of drugs in each group was injected in L4-L5 interspace using 25G spinal needle. Spinal spread assessment continued every 2 minutes until the spinal spread remains unchanged for three consecutive assessments. Surgery was allowed to proceed after T6 to T4 sensory blockades to cold sensation had been established. IV crystalloids (normal saline / ringer lactate) and ephedrine were administered as needed to treat hypotension (systolic blood pressure less than 20% of baseline) and in case of bradycardia (heart rate less than 60bbm) atropine was administered at dose 0.5mg\kg. All patients received an iv infusion of oxytocin after delivery. The TAP block group received a landmark orientated Ultrasound guided bilateral TAP block, The ultrasound probe was placed in a transverse plane to the lateral abdominal wall in the midaxillary line, between the lower costal margin and iliac crest (triangle of petit). The use of ultrasound allows for accurate deposition of the local anesthetic in the correct neurovascular plane. Continuous aspiration of the syringes after every 5ml of local anesthetic (LA) was maintained to avoid accidental intravascular injection. TAP block was preformed after closure of incision. Therefore, the injection was painless. Full-term Singleton pregnant females aged between 18 and 40 years were only included. Exclusion criteria involved refusal of block, bleeding disorders (platelets count <150,000; INR>1.5; PC<60%), wounds or infection at the puncture site and known allergy to local anesthetic drugs.

The primary outcome was time of first request of analgesia in hours (from time of anesthesia to the first registration of VAS score more than 3). Secondary outcomes were intra- and postoperative hemodynamics; blood pressure &heart rate, VAS (visual analogue scale) score during first 24 hours postoperatively, intra-, and postoperative nausea, vomiting, motor power, sensory level and complications of spinal anesthesia and TAP block. The quality of recovery and postoperative pain were assessed by The ObsQoR 11 questionnaire that contains items derived from four clinically relevant dimensions of good postoperative quality of recovery, including physical comfort, emotional state, physical independence and care of the newborn, and pain.

STATISTICS/DATA ANALYSIS:

Power analysis was performed using G power program on the level of time to first analgesic request using one-way NAOVA because it was the main outcome variable in the present study. A previous study has reported that the mean (SD) time to first analgesic request in TAP group versus TAP + [dexmedetomidine] was 7.5 (3.6) and 14 respectively [(9)] and for a power of 0.95 and an alpha error of 0.05, a minimum sample size of 45 patients for each group was calculated. The sample size was increased to 50 for each group to compensate for drop out.

RESULTS:

The mean age of included women was 25.8 years old. The majority of included women were ASA II (93.6%). There was no statistically significant difference between groups regarding age and ASA classification (Table 1). Patients in group (B) had lower VAS after the caesarean sections than patients in group (A) and group (C). Patients in group (C) had lower VAS after caesarean sections compared with those in group (A) starting 4h postoperatively (Table 2). The incidence of VAS score (≥3) was higher in

group A and group C than group B after operation by 4 hours, 6 hours, 8 hours, and 12 hours (Table 3). The mean of ObsQoR-11 was higher in Group B than group (C) and group (A) and was higher in group (C) than group (A) (Table 4). Table (5) reported that the time to first request of analgesia was longer in group (B) than group (A) and group (C). Moreover, it was longer in group (C) than group (A). Patients in group (B) have statistically lower mean arterial pressure throughout the caesarean sections compared with patients in group (A) and group (C). Patients in group (C) showed an increase in (MAP) versus group (A) from 5 to 20 minutes after spinal, however this increase was statistically significant only at 10 minutes after spinal. At the baseline intra-operative, there was no statistically significant difference between groups regarding MAP (Table 6). Patients in group (B) have statistically lower heart rate (HR) throughout the caesarean sections compared with patients in group (A) and group (C). At the baseline intra-operative, there was no statistically significant difference between groups regarding HR (Table 7). Patients in group (B) have statistically lower mean arterial pressure (MAP) after the caesarean sections compared with patients in group (A). However, the decreased (MAP) in group (B) versus group (C) was noticed all through 24h except from 2 to 6h postoperatively. Mean arterial pressure (MAP) was statistically lower in group (C) when compared with group (A) starting from 2h postoperatively (Table 8). Patients in group (B) have statistically lower heart rate (HR) after the caesarean sections compared with patients in group (A). However, the decrease in HR in group (B) versus group (C) was noticed all through 24h except at 2,4h postoperatively Patients in group (C) had lower HR after caesarean sections comparing with those in group (A) starting from 2h postoperatively (Table 9). Patients in group (B) have statistically lower heart rate (HR) after the caesarean sections compared with patients in group (A) and group (C). Patients in group (C) had lower HR after caesarean sections compared with those in group (A). The mean of onset for motor block, duration of motor block and time to 2-segment regression of spinal anesthesia were 60.8 second, 3.4 hours and 58.2 minutes, respectively. There was statistically significant difference in onset of sensory block between group (A) and group (C) and between group (B) and group (C) (Table 10). Apgar score was 9.6 in group (A), 9.5 in group (B) and 9.3 in group (C); there was no statistically significant difference between the three groups regarding neonatal Apgar score (Table11). The incidence of post-operative nausea and vomiting were higher in group A (46.8%) than group B (14.9%) and group C (17%) (Table 12).

Table (1): Age & ASA:

	Total	Group (A)	Group (B)	Group (C)	P value
Age	25.8±3.9	26.4±3.66	25.5±4.06	25.66±4.14	0.51
ASA					
II	9(6.4%)	4(8.5%)	3(6.4%)	2(4.3%)	

Table (2): Post-operative visual analogue scale (VAS):

VAS (postoperative)	Group (A)	Group (B)	Group (C)	P value
VAS score after 1 hour	0.26±0.44	0.11±0.31	0.34±0.48$^{\#}$	P_1=0.07 P_2=0.6 **P_3=0.03**
VAS score after 2 hours	1.09±0.28	0.81±0.45*	0.94±0.25$^{\#}$	**P_1=0.021** P_2=0.09 **P_3=0.045**
VAS score after 4 hours	1.98±0.39	1.19±0.4*	1.66±0.48*$^{\#}$	**P_1=0.00 P_2=0.04 P_3=0.00**
VAS score after 6 hours	2.91±0.58	1.64±0.5*	2.15±0.36*$^{\#}$	**P_1=0.00 P_2=0.04 P_3=0.00**
VAS score after 8 hours	3.83±0.67	2.09±0.5*	2.74±0.44*$^{\#}$	**P_1=0.00 P_2=0.02 P_3=0.00**
VAS score after 12 hours	4.53±0.55	2.74±0.5*	3.77±0.6*$^{\#}$	**P_1=0.00 P_2=0.03 P_3=0.023**
VAS score after 24 hours	5.49±0.62	3.87±0.74*	4.70±0.62*$^{\#}$	**P_1=0.00 P_2=0.02**

				P_3=0.01

Two-way ANOVA with repeated measures. P_1 Indicates significant differences between group (A) and group (B), P_2 Indicates significant differences between group (A) and group (C), P_3 Indicates significant , differences between group (B) and group (C), The data were represented as mean ±S mentioned otherwise. * This is a significant change versus group (A), # This is a significant change versus group (B).

Table (3): Incidence of VAS score (≥3):

		Group A	Group B	Group C	P value
VAS after 4 hours	N	3	0	0	**.047**
	%	6.4%	0.0%*	0.0%*#	
VAS after 6 hours	N	37	1	7	**.000**
	%	78.7%	2.1%*	14.9%*#	
VAS after 8 hours	N	47	8	35	**.000**
	%	100.0%	17.0%*	74.5%*#	
VAS after 12 hours	N	47	33	47	**.000**
	%	100.0%	70.2%*	100.0%*#	
VAS after 24 hours	N	47	46	47	.365
	%	100.0%	97.9%	100.0%	

Table (4): Obstetric Quality of Recovery (ObsQoR-11) survey:

	Total	Group (A)	Group (B)	Group (C)	P value
ObsQor11	85.8±12.7	76.4±6.0	97.5±13.1*	83.5±6.8*#	**P_1=0.00 P_2=0.03 P_3=0.00**

One way ANOVA. P1 Indicates significant differences between group (A) and group (B), P2 Indicates significant differences between group (A) and group (C), P3 Indicates significant differences between, unless mentioned otherwise. group (B) and group (C), The data were represented as mean ±S, * This is a significant change versus group (A), # This is a significant change versus group (B).
* This is a significant change versus group (A), # This is a significant change versus group (B)

Table (5): Time to first request of analgesia:

	Mean	Std. Deviation	Kaplan-Meier (P value)
Group A	8.02	1.55	0.001
Group B	23.13*#	2.57	
Group C	12.00*	2.16	
Total	14.38	6.76	

One way ANOVA, Kaplan-Meier survival analysis
* This is a significant change versus group (A), # This is a significant change versus group (B).

Table (6): Mean arterial pressure during elective caesarean sections:

MAP	Group (A)	Group (B)	Group (C)	P value
Baseline MAP	79.79±6.60	81.77±5.33	79.79±6.60	P_1=0.6 P_2=0.8 P_3=0.09
MAP after	78.23±7.39	74.60±6.37*****	76.85±6.74	**P_1=0.01**
Spinal				P_2=0.08 P_3=0.09
MAP 5min later	75.96±8.13	71.66±6.42*	78.02±6.86#	**P_1=0.02** P_2=0.1 **P_3=0.00**
MAP 10 min later	73.1±10.40	68.77±7.28*	77.49±7.60*#	**P_1=0.00 P_2=0.00 P_3=0.00**
MAP 15 min later	71.81±12.2	65.68±7.18*	74.49±9.59#	**P_1=0.01** P_2=0.2 **P_3=0.00**
MAP 20 min later	70.62±11.8 0	65.32±7.76	70.72±12.2#	P_1=0.07 P_2=0.6 **P_3=0.00**
MAP 25 min	70.87±11.7	65.40±8.92*	70.15±12.3#	**P_1=0.00** P_2=0.8

MAP	Group (A)	Group (B)	Group (C)	P value
later				**P_3=0.00**
MAP 30 min later	72.13±9.68	65.79±7.81*	72.38±8.88#	**P_1=0.001** P_2=0.9 **P_3=0.00**
MAP 35 min later	74.38±8.76	69.45±7.44	73.83±6.41	P_1=0.6 P_2=0.9 P_3=0.6
MAP 40 min later	75.36±6.97	69.53±8.17*	75.32±5.70#	**P_1=0.00** P_2=0.9 **P_3=0.00**
MAP 45 min later	76.26±6.11	69.00±8.80*	76.36±4.65#	**P_1=0.04** P_2=0.9 **P_3=0.04**
MAP 50 min later	76.83±8.49	71.13±3.88*	77.4±6.6#	**P_1=0.01** P_2=0.09 **P_3=0.02**
MAP 55 min later	77.62±4.28	66±9.22*	78.2±3.68#	**P_1=0.00** P_2=0.8 **P_3=0.00**
MAP 60 min later	78.74±4.17	73.74±3.19*	78.77±3.53#	**P_1=0.03** P_2=0.9 **P_3=0.03**

Two-way ANOVA with repeated measures. P1 Indicates significant differences between group (A) and group (B), P2 Indicates significant differences between group (A) and group (C), P3 Indicates significant differences between group (B) and group (C), The data were represented as mean ±S mentioned otherwise. * This is a significant change versus group (A), # This is a significant change versus group (B).

Table (7): Repeated measures for HR during elective caesarean sections:

HR	Group (A)	Group (B)	Group (C)	P value
HR baseline intraoperative	81.6±5.3	81.9±6.4	81.4±6.4	P_1=0.5 P_2=0.45 P_3=0.52
HR after spinal	82.7±5.7	72.8±4.3*	83.1±6.8#	**P_1=0.00** P_2=0.6
anesthesia				**P_3=0.00**
HR 5 min later	82.9±8.3	70.4±5.2*	85.3±6.8#	**P_1=0.00** P_2=0.8 **P_3=0.00**
HR 10 min later	83.4±11.2	70.2±11.4*	86.4±7.5#	**P_1=0.00** P_2=0.4 **P_3=0.00**
HR 15 min later	83.6±14.5	74.3±6.1*	87.5±6.7#	**P_1=0.00** P_2=0.2 **P_3=0.00**
HR 20 min later	85.3±9.6	75.9±6.9*	88.5±11.9#	**P_1=0.00** P_2=0.08 **P_3=0.00**
HR 25 min later	85.8±13.6	80.1±14.0	89.1±7.3#	P_1=0.09 P_2=0.07 **P_3=0.04**
HR 30 min later	86.3±10.6	73.8±8.7*	89.0±7.7#	**P_1=0.00** P_2=0.8 **P_3=0.00**
HR 35 min later	86.0±8.7	75.4±10.6*	88.1±8.4#	**P_1=0.01** P_2=0.09 **P_3=0.00**
HR 40 min later	84.5±8.5	74.9±7.1*	86.7±7.6#	**P_1=0.00** P_2=0.9 **P_3=0.00**
HR 45 min later	83.6±7.8	76.0±7.5*	85.2±6.4#	**P_1=0.00** P_2=0.9 **P_3=0.00**
HR 50 min later	83.2±6.0	76.4±7.7*	84.3±5.5#	**P_1=0.04** P_2=0.7 **P_3=0.00**
HR 55 min later	82.7±5.1	77.0±7.9*	*83.3*±5.0	**P_1=0.00.**090P_2=
				P_3=0.07

HR	Group (A)	Group (B)	Group (C)	P value
HR 60 min later	82.1±4.4	70.4±6.7*	82.6±3.9#	**P_1=0.00** P_2=0.09 **P_3=0.00**

Two-way ANOVA with repeated measures. P1 Indicates significant differences between group (A) and group (B), P2 Indicates significant differences between group (A) and group (C), P3 Indicates significant differences between group (B) and group (C), The data were represented as mean ±S mentioned otherwise. * This is a significant change versus group (A), # This is a significant change versus group (B).

Table (8): repeated measures for post-operative MAP after CS:

MAP (postoperative)	Group (A)	Group (B)	Group (C)	P value
MAP after 1 hour	78.74±4.17	73.74±3.19*	78.77±3.53#	**P_1=0.02** P_2=0.09 **P_3=0.00**
MAP after 2 hours	78.98±4.31	76.70±4.1*	76.51±4.44*	**P_1=0.00** **P_2=0.00** P_3=0.9
MAP after 4 hours	80.3±4.9	76.4±3.9*	76.5±4.1*	**P_1=0.01** **P_2=0.012** P_3=0.08
MAP after 6 hours	81.7±4.9	75.7±3.8*	76.1±3.8*	**P_1=0.00** **P_2=0.00** **P_3=0.7**
MAP after 8 hours	82.6±4.2	75.4±4*	77.6±3.6*#	**P_1=0.00** **P_2=0.00** **P_3=0.035**
MAP after 12 hours	83.7±5.2	74.9±4.3*	79.1±3.9*#	**P_1=0.00** **P_2=0.03** **P_3=0.01**
MAP after 24 hours	84.2±3.9	75.5±3.6*	81.6±4.7*#	**P_1=0.00** **P_2=0.042** **P_3=0.00**

Two-way ANOVA with repeated measures. P1 Indicates significant differences between group (A) and group (B), P2 Indicates significant differences between group (A) and group (C), P3 Indicates significant , differences between group (B) and group (C), The data were represented as mean ±S mentioned otherwise. * This is a significant change versus group (A), # This is a significant change versus group (B).

Table (9): Repeated measures for HR after elective caesarean sections:

HR	Group (A)	Group (B)	Group (C)	P value
HR after 1 hour	82.1±4.4	70.4±6.7*	82.6±3.9#	**P_1=0.00** P_2=0.98 **P_3=0.00**
HR after 2 hours	75.9±4.3	73.9±3.0*	73.8±3.1*	**P_1=0.00** **P_2=0.00** P_3=0.9
HR after 4 hours	77.5±4.2	73.5±3.2*	74.1±2.9*	**P_1=0.00** **P_2=0.012** P_3=0.7
HR after 6 hours	79.0±4.0	73.8±2.3*	75.9±2.5*#	**P_1=0.02** **P_2=0.01** **P_3=0.032**
HR after 8 hours	81.0±4.2	75.0±2.5*	77.7±3*#	**P_1=0.01** **P_2=0.02** **P_3=0.045**
HR after 12 hours	82.9±4.4	75.6±3.9*	79.8±3.0*#	**P_1=0.00** **P_2=0.02** **P_3=0.01**
HR after 24 hours	84.0±4.4	75.3±4.6*	81.4±3.1*#	**P_1=0.00** **P_2=0.04**

				P_3=0.00

Two-way ANOVA with repeated measures. P1 Indicates significant differences between group (A) and group (B), P2 Indicates significant differences between group (A) and group (C), P3 Indicates significant differences between group (B) and group (C), The data were represented as mean ±S mentioned otherwise.

Table (10): Sensory and motor block:

	Group (A)	Group (B)	Group (C)	P value
Onset motor block (second)	64.13±17.67	59.81±9.26	58.49±7.83	0.12
Duration of motor block (hour)	3.60±0.73	3.38±0.79	3.23±0.67	0.5
Onset sensory block (second)	39.15±0.74	40.53±11.04	32.1±10.8*#	**P_1=0.07** **P_2=0.00** **P_3=0.00**
Time 2 seg regression (minutes)	58.89±5.39	57.72±5.37	57.89±6.19	0.09

One way ANOVA. P1 Indicates significant differences between group (A) and group (B), P2 Indicates significant differences between group (A) and group (C), P3 Indicates significant differences between group (B) and group (C), * This is a significant change versus group (A), # This is a significant change versus group (B).

Table (11): Neonatal score Apgar:

	Total	Group (A)	Group (B)	Group (C)	P value
score Apgar Neonatal	9.5±0.8	9.6±0.7	9.5±0.7	9.3±0.9	0.245

One way ANOVA.

Table (12): Post-operative nausea and vomiting:

Nausea and vomiting		NO	YES	P value
Group A	Count	25	22	.000
	%	53.2%	46.8%	
Group B	Count	40*	7	
	%	85.1%	14.9%	
Group C	Count	39*#	8	
	%	83.0%	17.0%	
Total	Count	104	37	
	%	73.8%	26.2%	

* This is a significant change versus group (A), # This is a significant change versus group (B).

DISCUSSION:

Adequate management of post-cesarean section pain remains a challenge. Inadequately treated postoperative pain can contribute significantly to morbidity of surgical patients, resulting in the delay of patients' recovery and ability to return to daily functional activities. Early recovery is especially important for a patient who is expected to take care of her newborn shortly after an operative procedure [(10)]. In this study. We aimed to compare the quality of recovery in females undergoing cesarean sections receiving dexmedetomidine either intrathecally or in the TAP block in comparison to patients receiving conventional spinal anesthesia and TAP block and the results of our study found out that administration of Dexmedetomidine in bilateral TAP block is capable of increase duration of analgesia (Time of first request of analgesia) with lower VAS score in comparison with dexmedetomidine intrathecally. Although the addition of dexmedetomidine intrathecally is better than bupivacaine alone regarding the time of first request of analgesia and

VAS score postoperatively. As regarding the intraoperative hemodynamics, the results of present study showed unexplained decrease in MAP through the Cesarean section intraoperatively in group B versus group A and C and this would decrease the reliability of using the measured MAP intraoperatively as an indicator for pain assessment postoperatively. Also, the addition of dexmedetomidine intrathecally in group C showed initial increase in MAP versus group A at 5,10.15 minutes after spinal however this increase in MAP was statistically significant at 10 minutes after spinal and this could be due to the pharmacokinetic of the dexmedetomidine that explains the initial increase in MAP. Moreover, the intraoperative heart rate in group B showed unexplained decrease through the CS in comparison with group A and group C. Regarding the postoperative hemodynamics the results of present study showed that the MAP in group B was statistically significant lower than MAP in group A through 24h postoperatively. However, the MAP in group C was statistically significant lower than MAP in group A starting from 2h postoperatively. Which means that adding dexmedetomidine intrathecally or in TAP block shows significant decrease in MAP than bupivacaine alone. Also, it was shown that adding dexmedetomidine with TAP block resulted in significant decrease in MAP compared to adding dexmedetomidine intrathecally starting from 8h postoperatively and this could be explained that the effect of intrathecal dexmedetomidine was finished 8h postoperatively. Also adding dexmedetomidine with TAP block showed significant decrease in heart rate in group B postoperatively compared to group A and group C (starting from 6h postoperatively) and this could be explained that the effect of intrathecal dexmedetomidine was finished 6h postoperatively. Also, the incidence of postoperative nausea and vomiting was higher in women underwent anesthesia using bupivacaine alone than women underwent anesthesia using bupivacaine and dexmedetomidine as an adjuvant with spinal and TAP block. Our study results agree with that of Qi Chen. et al. [(11)] which reported that Transversus abdominis plane (TAP) block is a preferable technique for reducing postoperative pain in gynecological surgeries. Their study Compared between the analgesic efficacy and recovery quality after gynecological surgery by adding dexmedetomidine or fentanyl into an ultrasound-guided TAP block and worked on 100 gynecological patients. The primary outcomes were the first request time for PCIA bolus and quality of postoperative recovery assessed using the QoR-40 questionnaire 2 days after surgery. The secondary outcomes were the visual analog scale (VAS) scores at rest across the different time intervals, the total number of PCIA boluses required in 24 and 48 hours postoperatively, and associated complications. It was found that the first request time for PCIA was significantly longer in the TAP-DEX than in the TAP, TAP-FEN, and control groups. The QoR-40 scores were highest in the TAP-DEX group. VAS showed a significant decrease between TAP-DEX and TAP-FEN groups only at 6 hours. Also, our study results in agreement with Qianchuang Sun [(12)] who has done meta-analysis which evaluates analgesic effects of dexmedetomidine in transversus abdominis plane (TAP) block for abdominal surgery. It was done on 1212 patients investigating impact of adding dexmedetomidine to TAP block, pain score, duration of the block, opioid consumption and complications and he found out that DEX is a potential anesthetic adjuvant that can facilitate better postoperative analgesia, reduce postoperative analgesic requirements, and prolong the local anesthetic effect when administered in TAP blocks with less complications. In parallel to the results of our study A meta-analysis by Shuyan Liu et al. [(13)] demonstrated that intrathecal DEX could prolong the duration of sensory and motor block during spinal anesthesia on a total of 1478 patients, it delayed the time to first analgesic request and reduced the incidence of shivering, DEX didn't increase the incidence of postoperative nausea and vomiting. Furthermore, Samantaray et al., [(14)] reported that, with the addition of intrathecal 5 mcg Dex, the time to the first rescued analgesic request was prolonged by nearly 120 min, and the analgesic requirement was reduced in 24 h compared to adding saline or midazolam intrathecally. In a dose-response trial, the authors found a dose-related extension of analgesia with the addition of Dex. [(15)]. Also, Li et al., [(16)] study, compared with intrathecal 9 mg of bupivacaine alone, the onset time of sensory and motor block of parturients in combination of 9 mg of intrathecal bupivacaine with 5 μg of DEX was significantly shortened, and the duration of sensory block was significantly prolonged by 40 min. The recovery quality of parturients within 24 h after surgery was assessed by obstetric quality of recovery-11 score (ObsQoR-11, score from 0 to 10 in each term, where 0 = strongly agree and 10 = strongly disagree, the higher of the score, the higher of recovery quality), which was designed for parturients and presented by Ciechanowicz et. al; [(17)] Our study reported that, Obstetric Quality of Recovery was higher in women underwent anesthesia using bupivacaine and dexmedetomidine than women underwent anesthesia using bupivacaine alone. The ObsQoR-11 provides a valid, reliable, and responsive global assessment of recovery after elective Caesarean delivery.

CONCLUSION AND RECOMMENDATIONS:

Our study demonstrates the analgesic effect of adding dexmedetomidine intrathecally to the effect of adding dexmedetomidine in Tap block in CS compared to bupivacaine alone and provide

additional benefit to multimodal analgesia in parturients undergoing CS under spinal anesthesia. The addition of dexmedetomidine to bupivacaine in TAP block has been proved to prolong the duration of time at which first dose of rescue analgesia was sought and also the addition of dexmedetomidine with TAP block was even more than addition of dexmedetomidine intrathecally and with bupivacaine alone. The quality of recovery was not adequately assessed in previous studies in parturients undergoing CS under spinal anesthesia with postoperative [TAP] with or without dexmedetomidine in either spinal or [TAP] and further studies are needed to evaluate the quality of recovery.

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