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Original Research Article

Effect of Dexmedetomidine as an Adjuvant to Ropivacaine in Transversus Abdominis Plane Block for PostoperativeAnalgesia in Patients Undergoing Abdominal Hysterectomy

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Conflict of interest: Nil

Abstract:

Background and Objectives: Ultrasound guided TAP Block is novel approach for blocking the abdominal wall neural afferents (T6- L 1). It is used for postoperative analgesia in various abdominal surgeries. Here we compared analgesic effect of dexmedetomidine added to ropivacaine in TAP block vs dexmedetomidine given intravenously atthe time of TAP block in patients undergoing abdominal hysterectomy. Secondary outcomes were to measure duration of analgesia, quality of analgesia, analgesic requirements in first 24h, sedation scores and any adverse outcomes.

Methodology: A randomized double blinded study was performed with sixty patients of ASA I and II undergoing abdominal hysterectomy under subarachnoid block. At the end of surgery ultrasound guided TAP block was performed either with 0.375% ropivacaine 20 ml along with 0.5 mcg/kg dexmedetomidine as additive (Group DL, N = 30) and 100 ml NS as infusion or with 0.375% ropivacaine 20 ml along with 0.5 mcg/kg intravenous dexmedetomidine in 100ml NS (Group DS, N=30). Patients were assessed for quality of analgesia by VAS score, duration of analgesia, requirement of rescue analgesics, sedation, nausea or vomiting, haemodynamic parameters like pulserate and blood pressure and any side effects for first 24h after block.

Results: Demographic parameters were comparable in both the groups. VAS scores were lower in group DL than group DS at all time of assessment but it was statistically significant 1h and 2h after block. Duration of analgesia was significantly prolonged ingroup DL (6.32 ± 4.720h vs 2.98 ± 1.418h $p < 0.05$). total tramadol consumption was significantly lower in group DL 73.3± 29.3mg when compared to group DS 96.6± 34.5mg, ($p < 0.05$). Sedation scores were significantly lower in group DS at first h after the block, ($p < 0.05$). There were no statistically significant differences in haemodynamic parameters among both the group at most of time points of assessment, even if it was significant statistically at some time points, it is clinically significant. One patient developed hematoma at the site of block. No side effects related to drugs noted.

Conclusion: TAP block is effective as part of multimodal analgesia not as sole analgesia for abdominal hysterectomy. Dexmedetomidine as an adjuvant to ropivacaine in TAP block prolongs duration of analgesia and reduces consumption of rescue analgesics when compared to systemic administration of dexmedetomidine.

Keywords: Dexmedetomidine, TAP block, Abdominal hysterectomy, Ropivacaine.

Introduction

Patients undergoing abdominal hysterectomy always experience moderate to severe postoperative pain. [1] Uncontrolled post-operative pain leads to unwanted adverse events ranging from patient's discomfort, prolonged immobilization to chronic effects which leads to increased morbidity. [2] The pain following abdominal hysterectomy can be from incisional site or from deeper (visceral) structures or dynamic pain such as during coughing or on mobilization but mainly contributed by abdominal wall incision. [3] Multimodal postoperative pain treatment regimen is required for these patients which includes systemic analgesics and regional techniques. Most commonly used is systemic analgesic drugs are NSAIDS and opioids. Regional techniques include central neuraxial block and peripheral nerve blocks. All analgesicmodalities have their own advantages and disadvantages. [4] Transversus abdominis plane (TAP) block is a novel type of peripheral nerve block which blocks dermatomes from T6-L1.

It provides adequate post-operative pain relief following various abdominal surgeries. [2] TAP block inhibits abdominal neural afferents by introducing local Anaesthetic (LA) drugs into the neuro fascial plane between the internal oblique and transversus abdominis muscles. With the widespread availability of ultrasound guidance for more accurate localization of TAP (than the 'blind' technique), theTAP block is an established technique for reduction of post-operative pain following abdominal surgery. [5] Most commonly used Local Anaesthetics (LA) are bupivacaine and ropivacaine. Ropivacaine is less cardiotoxic and its intrinsic vasoconstrictor propertyprolongs the duration of action. It has longer duration of sensory blockade than motor blockade. [6] TAP block duration is limited to effect of administered local anesthetics. The use of continuous infusion catheter to administer LA is an option to prolong the block duration. Recently adjuvant medications like dexamethasone, magnesium sulphate, fentanyl, clonidine are added to LA to prolong the duration of TAP block [7,3]. Dexmedetomidine is also being used as an adjuvant for different regional blocks. Alpha (α)-2-adrenergic receptor (AR) agonists have been the focus of interestfor their sedative, analgesic, perioperative sympatholytic, anaesthetic sparing and hemodynamic-stabilizing properties. Dexmedetomidine, a highly selective α2-AR agonist with a relatively high ratio of α2/ α1 activity (1620:1 as compared to 220:1 for clonidine), possesses all these properties but is devoid of respiratory depression, making it a useful and safe adjuvant in diverse clinical applications. [8] Adding dexmedetomidine to local anaesthetics for peripheral nerve blocks and regional anaesthesia has shown to prolong the duration of post-operative analgesia. Some studies have shown intravenous dexmedetomidine can be used as anadjuvant to prolong duration of peripheral nerve blocks and central neuraxial blockade. [9,10]

Methodology

Source of Data:

Sixty patients undergoing total abdominal hysterectomy procedure under spinal anaesthesia at SDM College of Medical Sciences and Hospital during my study period from December 2016 to May 2018 were selected for the study after obtaining written informed consent from the patients.

1. Inclusion criteria:

- Patients who are undergoing elective abdominal hysterectomy.
- Age group from 18 to 70 years
- ASA physical status I or I.
- Those willing to participate.

2. Exclusion criteria

- Patient refusal
- Patients with asa iii and iv
- Patients with bmi < 18 kg/m^2 and > 40 kg/m^2
- Local infection at the site of block
- Allergy to study medications
- Chronic use of pain medications or adrenoreceptor agonists or antagonists
- Patients with coagulation abnormalities/ any contraindication to spinal anesthesia.

Type of Study: Randomised double blinded study.

Study Area: Study was conducted in operation theatre complex of SDM medical hospital.

Statical Analysis: All the data were collected, tabulated and expressed as mean ± standard deviation.

Data were analyzed using Statistical Package for Social sciences (SPSS 20.0 Evaluation version). Independent sample t-test, Chi-square test has been used appropriately Variables like age, weight, pulse rate blood pressure VAS score, duration of analgesia and sedation scores were represented by mean ± S.D. Statistical significance in mean difference was done by using 2 independent sample t-test. Chi-square test was used to statistically asses the ASA, type of surgery, analgesic requirements and nausea /vomiting. P value of <0.05 was considered statistically significant and <0.001 was considered highly significant. P value of > 0.05 was considered statistically insignificant.

Observation and Results

In the present study 60 ASA I and ASA II patients scheduled to undergo abdominal hysterectomy were randomized into two groups (group DS, group DL). None of the patients were excluded after recruitment and all patients completed the study. They were compared in view of duration of postoperative analgesia, requirement of analgesics, quality of analgesia (VAS Scores), sedation, haemodynamic parameters like heart rate and blood pressure and adverse effects. All the data were collected, tabulated and expressed as mean ± standard deviationAnd statistical analysis was performed appropriately as mentioned above.

Demographic Profile

a. Age

Table 1: Age distribution(years)

Group	N	Mean	Std. Deviation	t
Group DS	30	44.10	5.921	0.864
Group DL	30	42.77	6.033	p=0.391

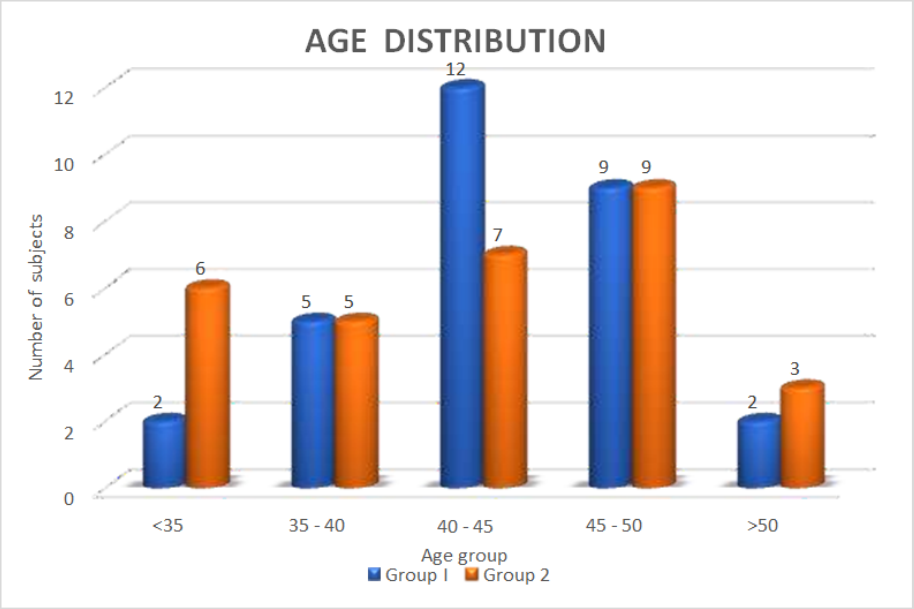

Figure 1: Age distribution among both groups

Mean age in the group DS is 44.10±5.921 and mean age in group DL is 42.77±6.033. The p value is > 0.05 and hence, it is not statistically significant.

a. Weight

Table 2: Comparison of weight distribution among both the groups

Group	N	Mean	Std. Deviation	t
Group DS	30	61.80	7.919	0.477
Group DL	30	62.83	8.844	p=0.635

Mean weight in group DS is 61.80±7.919 and mean weight in group DL is62.83±8.844, p value (> 0.05).

a. ASA status

Table 3: ASA status of patients among both the groups

		Group		Total
		Group DS	Group DL	
	Count	18	18	36
ASA I				
	%	60.0%	60.0%	60.%
	Count	12	12	24
ASA II				
	%	40.0%	40.0%	40.%
	Count	30	30	60
Total				
	%	100.0%	100.0%	100.%

As the table above depicting 60% patients were ASA I in both the groups and 40%were ASA II. Hence patients were of similar ASA status in both the groups.

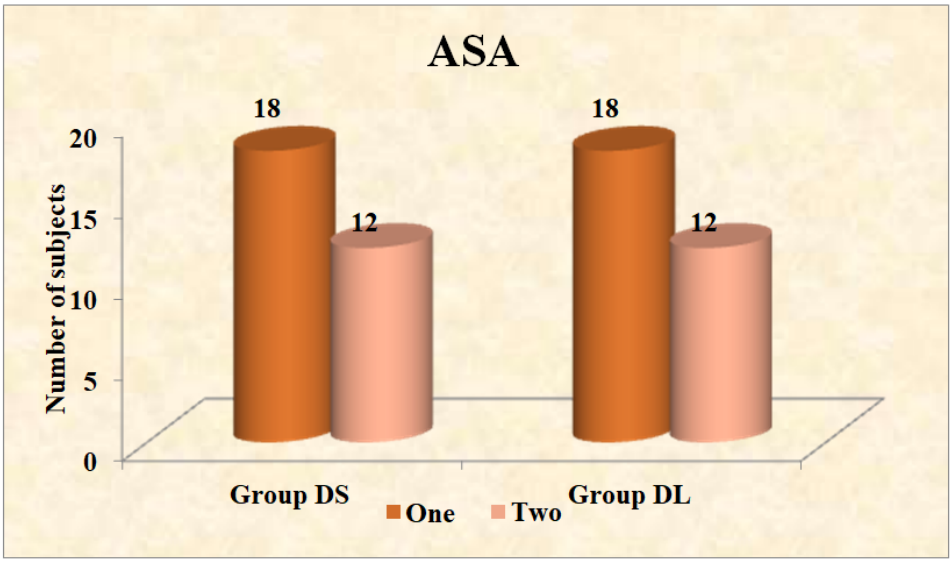

Figure 3: ASA status of patients among both the groups

Vital Parameters

a. Pulse Rate

Table 5: Comparison of pulse rate(bpm) at various time points of assessment.

	Group	N	Mean	Std. Deviation	t
PREINDUCTION	Group DS	30	82.00	10.462	556
	Group DL	30	80.53	9.961	p=0.58
Immediate	Group DS	30	70.70	12.200	390
	Group DL	30	71.77	8.697	p=0.698
15 MIN	Group DS	30	65.47	10.378	1.794
	Group DL	30	69.63	7.360	p=0.078
30MIN	Group DS	30	63.77	8.791	1.828
	Group DL	30	67.77	8.144	p=0.073
45 MIN	Group DS	30	64.50	9.702	.980
	Group DL	30	66.80	8.426	p=0.331
60MIN	Group DS	30	66.33	9.430	.309
	Group DL	30	65.60	8.947	p=0.758
2HOUR	Group DS	30	69.47	10.173	.126
	Group DL	30	69.13	10.371	p=0.90
4HOUR	Group DS	30	73.00	8.610	.032
	Group DL	30	73.07	7.469	p=0.0.95
8 HOUR	Group DS	30	73.70	7.804	.726
	Group DL	30	75.20	8.202	p=0.471
12HOUR	Group DS	30	75.90	8.264	.328
	Group DL	30	75.23	7.477	p=0.744
16 HOUR	Group DS	30	76.90	7.549	.511
	Group DL	30	75.87	8.102	p=0.611
20 HOUR	Group DS	30	80.21	8.495	1.273
	Group DL	30	77.53	7.624	p=0.208
24 HOUR	Group DS	30	77.90	7.364	.128
	Group DL	30	78.13	6.766	p=0.899

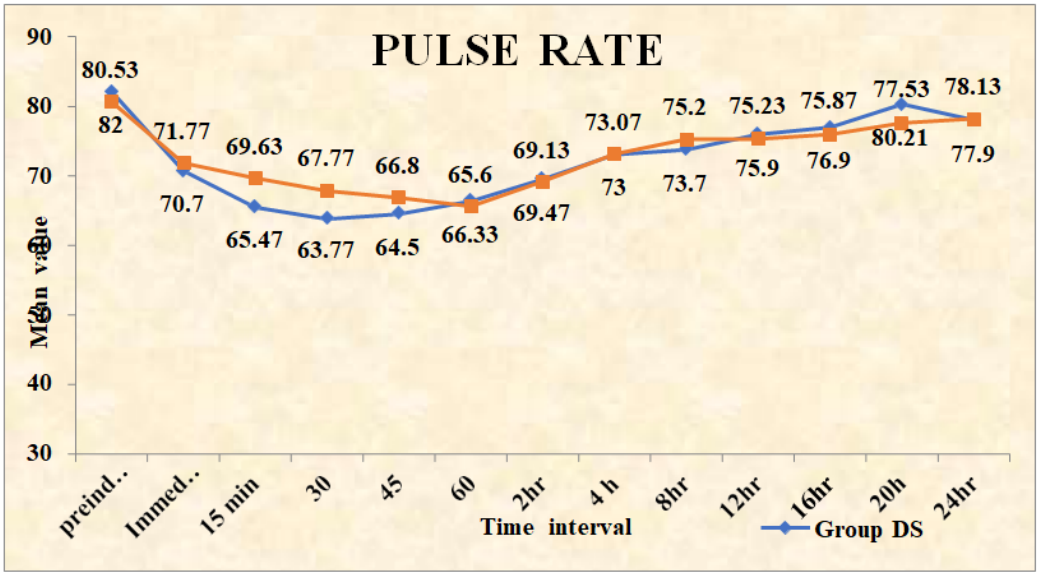

Figure 4: Comparison of pulse rate(bpm) at various time points of assessment.

Statistical analysis of baseline and postoperative mean pulse rate between Group DS and Group DL was done using independent sample t-test.

Statistically no significant difference was found at baseline mean pulse rate values between Group DS and Group DL. (P value > 0.05).

Statistically no significant difference was found in mean pulse rate measured immediately, at 15 min, 30 min 45 min 60 min 2h, 4h and thereafter 4 hourly till 24 hours between both groups.

Mean pulse rate in group DS was less in 1st hour of block when compared with meanpulse rate of group DL. But this decrease in pulse rate neither statistically nor clinically significant.

Table 6: Systolic blood pressure

	Group	Mean	Std. Deviation	t
Pre-induction	Group DS	123.47	11.190	2.082
	Group DL	117.93	9.314	p=0.42
5 MIN	Group DS	116.27	17.231	2.012
	Group DL	108.17	13.752	p=0.049
15 MIN	Group DS	108.50	14.642	0.432
	Group DL	107.00	12.106	p=0.667
30MIN	Group DS	106.97	13.459	0.654
	Group DL	104.90	10.892	p=0.516
45 MIN	Group DS	107.60	14.436	1.524
	Group DL	102.77	9.659	p=0.133
60MIN	Group DS	110.27	14.774	1.986
	Group DL	104.00	8.964	p=0.058
2HOUR	Group DS	113.37	13.257	1.433
	Group DL	108.80	11.174	p=0.155
4HOUR	Group DS	118.13	10.647	1.414
	Group DL	114.47	9.406	p=0.163
8 HOUR	Group DS	116.27	10.722	0.961
	Group DL	113.72	9.543	p=0.341
12HOUR	Group DS	119.53	9.243	1.933
	Group DL	115.03	8.613	p=0.058
16 HOUR	Group DS	121.10	10.797	2.226
	Group DL	115.24	9.341	p=0.03
20 HOUR	Group DS	122.00	9.642	0.983
	Group DL	119.59	9.202	p=0.33
24 HOUR	Group DS	123.53	7.310	1.720
	Group DL	120.14	7.855	p=0.091

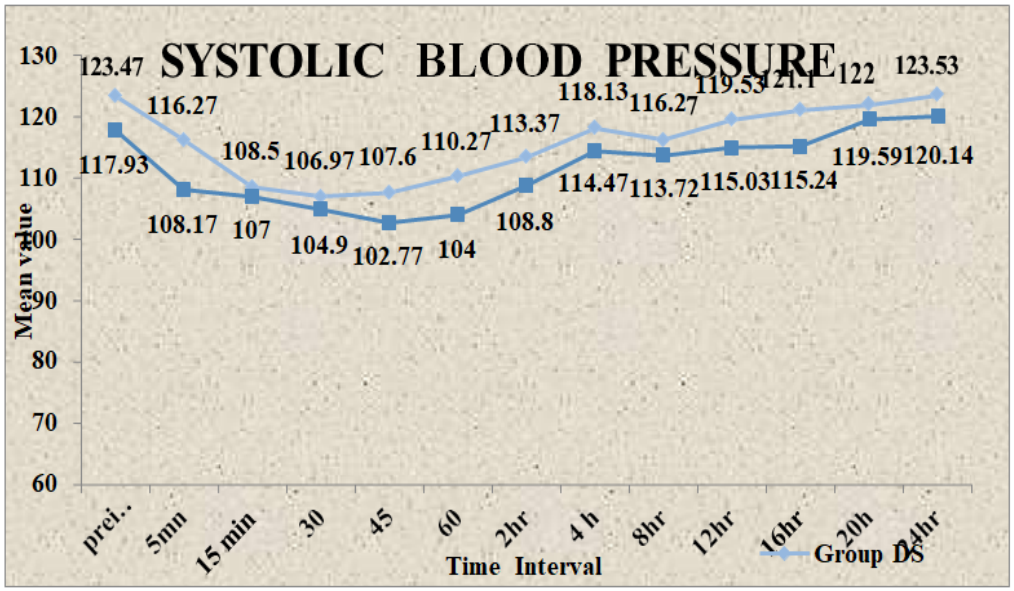

Figure 5: Comparison of systolic blood pressure (mm hg) at various time points of assessment

Statistical analysis of baseline and postoperative mean systolic blood pressure between Group DS and Group DL was done using independent sample t-test.

Statistically no significant difference was found at baseline mean systolic blood pressure values between Group DS and Group DL. (P value >0.05).

Systolic blood pressure was significantly higher in group DS during immediate postoperative period. Systolic blood pressure at all time points measured was higher in group DS than group DL but it is not statistically significant. It was significantly higher in group DS at 16h postoperative period. But all the measured blood pressure values in both the groups were within 20% of baseline value, hence clinical significance cannot be corelated.

Diastolic Blood Pressure

Table 7: Comparison of diastolic blood pressure (mmHg) at various time points ofassessment

	Group	N	Mean	Std. Deviation	t
Pre induction	Group DS	30	76.67	6.994	0.341
	Group DL	30	76.03	7.402	p=0.735
Immediately	Group DS	30	70.77	10.925	0.617
	Group DL	30	69.21	8.278	p=0.54
15 MIN	Group DS	30	67.80	8.927	0.421
	Group DL	30	66.97	5.937	p=0.675
30MIN	Group DS	30	65.30	8.486	0.548
	Group DL	30	66.31	5.231	p=0.586
45 MIN	Group DS	30	67.23	10.566	0.502
	Group DL	30	66.10	6.032	p=0.618
60MIN	Group DS	30	69.60	10.753	1.979
	Group DL	30	65.14	5.730	p=0.053
2HOUR	Group DS	30	71.70	10.107	1.609
	Group DL	30	68.14	6.430	p=0.113
4HOUR	Group DS	30	75.63	9.122	1.930
	Group DL	30	71.45	7.424	p=0.059
8 HOUR	Group DS	30	76.67	8.934	2.203
	Group DL	30	72.00	7.211	p=0.032
12HOUR	Group DS	30	76.83	7.465	2.258
	Group DL	30	72.55	7.089	p=0.028
16 HOUR	Group DS	30	74.40	6.693	0.679
	Group DL	30	73.24	6.401	p=0.05
20 HOUR	Group DS	30	75.93	7.400	0.173
	Group DL	30	76.28	7.833	p=0.863
24 HOUR	Group DS	30	79.53	7.157	1.124

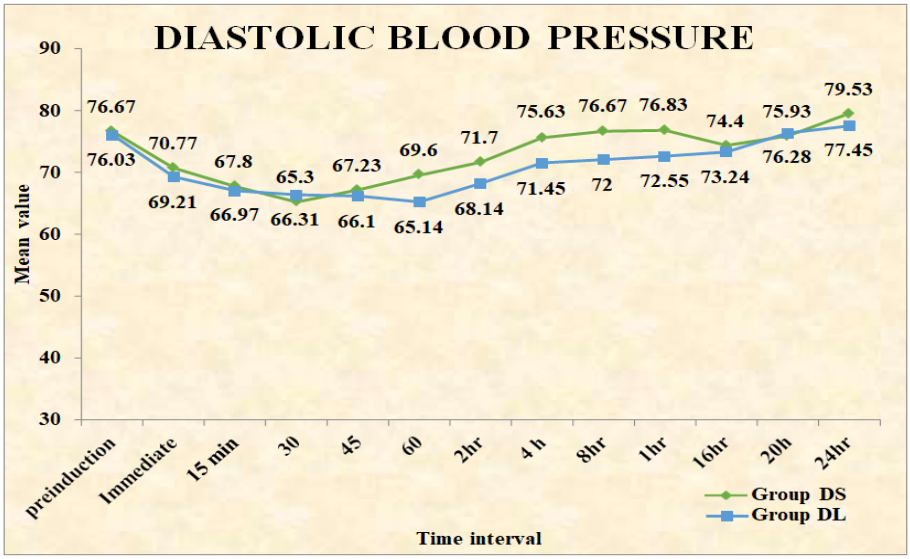

Figure 25: Comparison of diastolic blood pressure (mmHg) at various time points of assessment

Statistical analysis of baseline and postoperative mean diastolic blood pressure between Group DS and Group DL was done using independent sample t-test.

- Statistically no significant difference was found at baseline diastolic blood pressure values between Group DS and Group DL (P value > 0.05).
- Statistically no significant difference was found at mean diastolic blood pressure values in postoperative period at most of the time points assessed between Group DSand Group DL (P value >0.05).
- Significant higher diastolic blood pressure was found in group DS at 8h and 12 h postoperative period which was clinically insignificant.

Postoperative pain assessment

Quality of postoperative analgesia

Table 8: Comparison of VAS score at various time points of assessment

	group	N	Mean	Std. Deviation	t	
Immediate	Group DS	30	2.43	1.888		3.473
	Group DL	30	0.93	1.387	p<0.001	
15 MIN	Group DS	30	1.03	0.964		1.911
	Group DL	30	0.59	0.825	p=0.061	
30MIN	Group DS	30	0.53	0.730		0.906
	Group DL	30	0.38	0.561	p=0.369	
45 MIN	Group DS	30	0.50	0.731		1.130
	Group DL	30	0.31	0.541	p=0.264	
60MIN	Group DS	30	0.93	1.507		2.378
	Group DL	30	0.24	0.435	p=0.021	
2HOUR	Group DS	30	2.80	2.235		2.704
	Group DL	30	1.34	1.876	p=0.009	
4HOUR	Group DS	30	2.67	2.279		0.588
	Group DL	30	2.31	2.377	p=0.559	
8 HOUR	Group DS	30	1.63	1.497		0.431
	Group DL	30	1.83	1.947	p=0.664	
12HOUR	Group DS	30	2.00	2.133		0.530
	Group DL	30	2.31	2.362	p=0.598	
16 HOUR	Group DS	30	1.87	1.833		1.016
	Group DL	30	1.45	1.270	p=0.314	
20 HOUR	Group DS	30	2.33	2.073		0.160
	Group DL	30	2.24	2.340	p=0.874	
24 HOUR	Group DS	30	2.33	1.826		0.023
	Group DL	30	2.34	2.023	p=0.982	

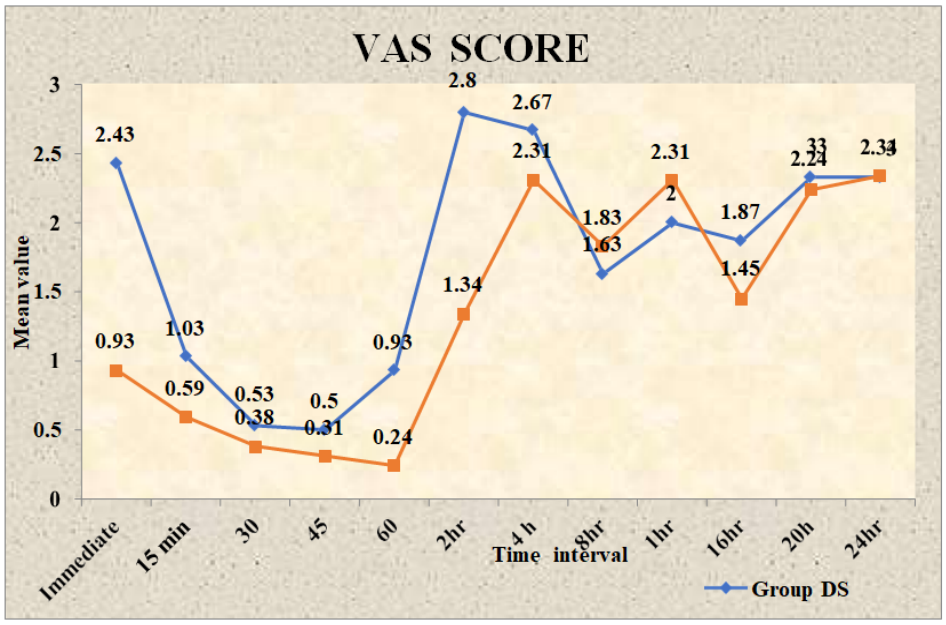

Figure 6: Comparison of VAS scores at various time points of assessment

Visual Analogue Scale (VAS) was observed at postoperative period – immediately(<5 minutes) 15min 30min 45min 60min,2h,4h,12h and 24h and statisticallyanalyzed by student t test.

On comparison of VAS score between the 2 groups, it was observed that patients of Group DS showed higher degree of pain (higher VAS scores) as compared to Group DL and this was statistically significant in immediate postoperative period 15min 1 h2 h (P value <0.0005).

VAS scores at 45min, 4h 16h 20h were less in group DL when compared with group DS, but it was not statistically significant.

VAS scores at 8h and 12h period it was higher in group DL than group DS though it was not statistically significant.

VAS scores in both groups were comparable at 24h.

b. Total Duration of Analgesia

Table 9; Comparison of total duration of analgesia among both thegroups

Group	N	Mean	Std. Deviation	t
Group DS	30	2.980	1.418	3.714
Group DL	30	6.322	4.720	<0.001

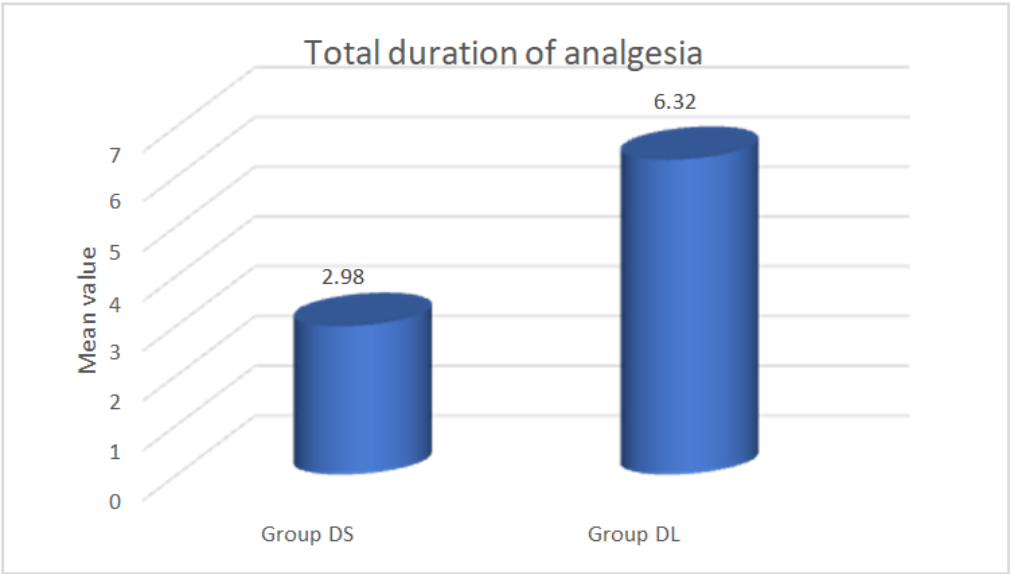

Figure 7: Mean duration of analgesia in both the groups

Mean duration of analgesia that is mean time for first rescue analgesia was 2.98 ±1.418h in group DS and mean duration in DL group was 6.32 ± 4.720h.

Mean duration of analgesia was prolonged in group DL than in group DS which was highly significant($p<0.001$)

Discussion

This current study is aimed to compare the analgesic effect of dexmedetomidine added to ropivacaine in TAP block vs dexmedetomidine given intravenously at the time of TAP block in patients undergoing total abdominal hysterectomy performed under spinal anaesthesia. Sixty patients of ASA I and II were included in the study and divided into two groups (group DS and group DL).

Patient characteristics across the groups: There was no significant difference in patients of two groups with respect to age, weight, ASA grade.

Quality of Postoperative Analgesia: It was measured by visual analogue score (VAS) where VAS 0= no pain and 10 worst imaginable pain) because it is unidimensional measure of pain intensity, which has been widely used in adult population.

We recorded VAS scores immediately after the block, 15min, 30 min, 45 min, 60 min, 2h, 4h, 8h, 12h, 16h, 20h and 24 h. When scores ≥ 3 rescue analgesics were given.

In our study mean VAS scores were not ≥ 3 at alltime points in both groups but higher scores were seen in group DS than group DL at all time points except at 8h and 12h and was statistically significant only at 60 min and 2h. In a study conductedby Carney et al. [11] found that when TAP block given with ropivacaine to patients undergoing abdominal hysterectomy had reduced VAS score (mean VAS score ≤3) at all points of time when compared to placebo group. In their study a bilateral TAP block was performed using 1.5 mg/kg 0.75% ropivacaine (to a maximal dose of 150mg) or saline on each side and all patients received general anaesthesia and analgesics like morphine at dose of 0.15mg/kg and rectal acetaminophen before skin incision. A standardized postoperative analgesic regimen, consisting of regular rectalacetaminophen 1 g every 6 h and rectal diclofenac 100 mg every 16 h, combined with IV PCA morphine was used. In our study only rescue analgesics were used and other standard postoperative analgesic regimen was not used and our results in termsof VAS score were comparable with this study.

In a study conducted by prateeba et al [12] comparing wound site infiltration versus ultrasound guided TAP block(TABP) with 2.5 mg/kg of 0.5 % ropivacaine in patients undergoing lower abdominal surgeries under spinal anaesthesia shown to have reduced VAS scores (VAS scores<3 not 0) in the patients with TAP block in first 24 h. Patients who underwent TAP Block took significantly longer time (6 h) to request for the first rescue analgesic (P = 0.001), with reduced VAS at the time of rescue analgesic (2.64 ± 0.969) when compared to patients who received Wound SiteInfiltration (3.04 ± 1.105). Methodology in this study was similar to our study exceptfor the dose of ropivacaine (0.5% vs 0.375%). VAS Scores in both the groups of our study was comparable with their study.

In study conducted by Aksu et al [13] evaluated efficacy of dexmedetomidine as adjuvant to bupivacaine in TAP block for lower abdominal surgeries. After anesthesia induction, ultrasound guided TAP block was performed. TAP block was obtained with 21 mL 0.9% saline in Group C (n = 31), 20 mL 0.5% bupivacaine + 1mL saline in Group B (n = 31), and 20 mL 0.5% bupivacaine + 1 mL dexmedetomidine (100 μg) in Group BD (n = 31). They found out that reduced VAS scores were seen in Group BD from 10h – 24 h when compared to group B. Also concluded that patients with TAP block had reduced VAS scores when compared to control group. In this study all patients received general anaesthesia and block was performed before skin incision. No standard analgesic regimen was given except PCA which is similar to our study. VAS scores of these study group were similar to Group DL in our study. The24 h morphine consumption in the control group, bupivacaine group and bupivacaine + dexmedetomidine group was 28.8 mg, 17.5 mg, and 8.2 mg, respectively in their study.

Mishra et al [14] conducted a study evaluating efficacy of dexmedetomidine as additive to ropivacaine in TAP block given to the patients undergoing lower abdominal surgeries. The study was conducted on forty patients undergoing lower abdominal surgeries under general anaesthesia. The patients were divided into two groups: one receiving plain ropivacaine (Group 1) and other receiving ropivacaine with dexmedetomidine (Group 2) during TAP block. VAS Scores were lower in dexmedetomidine group than ropivacaine alone group which were comparable withour study. But in this study all patients received general anaesthesia and ropivacainewas used at concentration of 0.2% which is different from our study where our patients received spinal anaesthesia and 0.375% ropivacaine for TAP block. In this study VAS score after first 12h were more than three and there is no mention of rescue analgesic usage.

Some studies were conducted comparing perineural dexmedetomidine versussystemic administration of dexmedetomidine with peripheral nerve blocks.

Abdallah et al [15] conducted a study to compare the efficacy of perineural and IV dexmedetomidine in prolonging the analgesic duration of single-injection interscalene brachial plexus block (ISB) for outpatient shoulder surgery. Ninety-ninepatients were

randomized to receive ISB using 15 ml ropivacaine, 0.5%, with 0.5 µg/kg dexmedetomidine administered perineurally (DexP group), intravenously (DexIV group), or none (control group). The duration of analgesia was 10.9 h (10.0to 11.8 h) and 9.8 h (9.0 to 10.6 h) for the DexP and DexIV groups, respectively, compared with 6.7 h (5.6 to 7.8) for the control group ($P < 0.001$).

Dexmedetomidine also reduced the 24-h cumulative morphine consumption to 63.9 mg (58.8 to 69.0 mg) and 66.2 mg (60.6 to 71.8 mg) for the DexP and DexIV groups, respectively, compared with 81.9 mg (75.0 to 88.9 mg) for the control group($P < 0.001$). Hence their study showed that both groups have prolonged duration of analgesia and reduced VAS scores when compared with control group but duration of analgesia and VAS scores among these both groups did not have significant difference. They concluded that there is no difference in VAS score and duration of analgesia with perineural and

IV dexmedetomidine administration in brachial plexus block. These results were similar to our study as there was no significant differences among both the groups interms of VAS scores.

Our study demonstrates that TAP block with 0.375% ropivacaine and dexmedetomidine as additive (group DL) provides better postoperative analgesia andbetter pain control. Though Patients in this group had lower VAS scores at most time points it was not statistically significant. Hence VAS Score were comparable with group DS where the patients received systemic dexmedetomidine along with 0.375% ropivacaine in TAP block.

Duration of analgesia and analgesic requirements: In our study mean duration of analgesia was measured among the group DS (2.98 ± 1.418h) and group DL (6.32 ± 4.720h). It shows analgesia is significantly prolonged in group DL in which patients received dexmedetomidine as additive to 0.375% ropivacaine.

Analgesic requirements were more in group DS than group DL at all time points assessed except at 8h post-operative period. Requirement of analgesic were comparable among both the groups at 4h and was statistically not significant.

Total consumption of tramadol for 24 h in group DL was 73.3± 29.3 mg when compared to group DS 96.6± 34.5 mg which was statistically significant. (p=0.042). Hence, we found that dexmedetomidine as an additive to ropivacaine in TAP block reduces analgesic consumption and prolongs duration of analgesia.

Our results were similar to the study conducted by Almarakbi et al [2]. In their study they evaluated the efficacy of dexmedetomidine in TAP block in patients undergoingabdominal hysterectomy. The time for first analgesic dose was longer in Group BD (patients in these group received 20ml of 0.25% bupivacaine with 0.5 mcg /kg dexmedetomidine) than Group B (patients in these group received only 0.25% bupivacaine). Duration of analgesia was 470 min group BD vs. 280 min in group BP.

< 0.001. The total morphine consumption was less among Group BD patients in comparison to those in Group B (19 vs. 29 mg/24 h, $P < 0.001$). Visual analog scoreswere significantly lower in Group BD in the first 8 h post-operatively when compared with Group B, both at rest and on coughing ($P < 0.001$). In this study all patients received general anaesthesia,0.25% bupivacaine was used instead of ropivacaine as in our study and IVPCA was used with morphine (1 mg bolus, lock out time interval of 10 min and 4-h limit of 0.25 mg/kg. Without baseline infusion).

Though methodology differs from our study results can be correlated in terms ofduration of analgesia and tramadol requirements.

In study conducted by Jodan et al [16] evaluating efficacy of TAP block with 0.375%ropivacaine in patients undergoing caesarean section, One hundred thirty-nine patients received TAP block with either 20 ml 0.375% ropivacaine or 20 ml saline. Time to first rescue analgesic was significantly prolonged in the TAP group (11 h (8-12)) compared to the control group (4 h (2.5 - 6)) ($p < 0.0001$). The median (interquartile range) number of doses of tramadol consumed in the TAP group was 0 (0,1) compared to 2 (1,2) in the control group ($p < 0.0001$). Though methodology was similar to our study but all patients received diclofenac 75mgIV at the end of surgery**.**

Conclusion

Based on our results we can conclude that: The addition of 0.5 mcg/kg dexmedetomidine to ropivacaine in ultrasound guided TAP block in patients undergoing abdominal hysterectomy provides better quality ofanalgesia as assessed by VAS score, reduced consumption of analgesics and prolonged duration of analgesia when compared with 0.5 mcg/kg Dexmedetomidine administered intravenously at the time. Hence dexmedetomidine is effective as adjuvant to ropivacaine in TAP block.

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