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Evaluation of Effectiveness of the Transversus Abdominis Plane Block to Provide Effective Postoperative Analgesia in Patients Undergoing Total Abdominal Hysterectomy

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Abstract

Introduction: *Total abdominal hysterectomy (TAH) is one of the most common surgery performed in gynecology. Transversus Abdominis Plane (TAP) block as a part of multimodal anesthesia is being increasingly used in patients undergoing total abdominal hysterectomy for benign as well as malignant conditions. It is easy to perform, technically simple, pharmacologically safe, effective and economically cheap. TAP block is a part of multimodal analgesic regimen and improved analgesia, decreased opioid consumption and its side effect during postoperative period. The purpose of this study was to evaluate effectiveness of TAP block to provide effective postoperative analgesia in patients undergoing total abdominal hysterectomy.*

Materials and Methods: *This was a prospective case control study of 100 patients undergoing total abdominal hysterectomy under TAP block. The institutional ethical committee approved the study and an informed written consent was obtained from all the patients. The patients were included in this study on the basis of a predefined inclusion and exclusion criteria. Amongst 100 cases included in this study 50 patients were given USG guided TAP block with ropivacaine (n =50) [TAP BLOCK GROUP] versus placebo (n=50) [CONTROL GROUP]. All patients underwent routine investigations such as complete blood count, coagulation profile, bleeding time, clotting time, ECG, LFT and KFT. If indicated further investigations were done in selected cases. Perioperative and postoperative hemodynamic parameters, VAS scores, ETCO2 levels requirement of rescue analgesia, Mean sedation scores and incidence of Post-operative nausea and vomiting (PONV) were compared in both the groups. P value less than 0.05 was taken as statistically significant.*

Results: *Mean age, height, weight and duration of surgery in both the groups were found to be comparable. The control group was found to have a higher heart rate, systolic BP, Diastolic BP and mean arterial pressures as compared to TAP block group at 5,10,15,20,30,40,50,60,75 and 90 minutes as well as in postoperative period and the difference was found to be statistically "highly significant" (P<0.0001). The analysis of VAS scores of the patients in post-operative period showed that Median VAS score at 1st hour was 3.0 (3.0, 3.0) and 5.0 (5.0, 6.0) in TAP block group and Control group respectively and the*

difference was statistically significant. (p<0.0001). Mean dose of RA required in 24-hour postoperative period was significantly lesser with TAP block than control group (54.5±4.0 Vs234.9±31.4, p<0.0001).
Conclusion: *TAP Block is associated with better hemodynamic stability, better pain control, lesser need of rescue analgesia and better sedation scores making it promising technique in alleviating postoperative pain in patients undergoing lower abdominal gynecological surgeries particularly when used as part of multi-modal analgesia regimen.*
Keywords: *Hysterectomy, Transversus Abdominis Plane (TAP) block, Hemodynamic Stability, Rescue analgesia.*

Introduction

Total abdominal hysterectomy (TAH) is one of the most common surgery performed in gynecology. Hysterectomy is reported only to be preceded by cesarean section as far as surgeries in obstetrics and gynaecology practice is concerned[1]. TAH is performed for malignant as well as benign indications such as uterine leiomyoma, persistent vaginal bleeding, or uterine prolapse. The open abdominal hysterectomy is considered a major surgery and is associated with a medium to high pain levels[2]. Patients undergoing TAH require a high-quality multimodal pain management program with a low rate of complications. Postoperative analgesia is essential to provide subjective comfort and restoration of functions like breathing, coughing, movement and communication effectively. From the ancient period, it was tried to do in many ways. As practiced, opioids such as morphine remain the mainstay of such regimen. However, the use of opioid only, can result in significant adverse effects like nausea vomiting, sedation, respiratory depression, constipation, etc. Only NSAID use may cause gastro-intestinal tract upset, bronchospasm, renal impairment etc. Epidural analgesia is in use, but it demands expertise; and failure rate is significant[3]. Other techniques like rectus abdominis sheath block, paravertebral block, ilioinguinal/ iliohypogastric block, local anesthetic infiltration etc are also tested. Yet, these have flaws as they are not easy to perform, do not give adequate analgesia, do not produce long enough analgesic duration etc. The latest trend is the practice of two or more analgesic approach simultaneously called multimodal analgesia. It can produce better pain control, reduce the individual dose of the agent and thereby reduce cost, low side effect and more therapeutic safety. Over recent years, Transversus Abdominis Plane (TAP) block became a part of multimodal analgesia[4].

TAP is a neurofascial plane between the Internal Oblique (IO) and Transversus Abdominis (TA) muscle of the abdominal wall through which all sensory nerves supplying the parietal peritoneum, skin and muscles of anterior abdominal wall pass. So, it is a novel approach to block these sensory nerves by injecting local anesthetic within the Transversus Abdominis Plane (TAP), termed as TAP block. Because the sensory afferent nerves run between the abdominal muscles, by a method called transversus abdominis plane block (TAP) block, these nerves could be blocked and postoperative pain could be managed[5]. This has been found to be an effective method in colon surgery, cesarean section with midline incision, and prostatectomy, and it is also effective in managing pain following abdominal hysterectomy. Ultrasonography guided nerve blocks offer the advantage of real-time imaging of the needle trajectory and injected spread. Use of ultrasonography for placement of the needle and drug distribution can lower the risks associated with TAP block and increases the safety and effectiveness of the block particularly in obese patients[6].

TAP block is easy to perform, technically simple, pharmacologically safe, effective and economically cheap. TAP block is a part of multimodal analgesic regimen and improved analgesia, decreased opioid consumption and its side effect during postoperative period[7]. The purpose of this study was to evaluate effectiveness

of TAP block to provide effective postoperative analgesia in patients undergoing total abdominal hysterectomy.

Materials and Methods

This was a prospective case control study of 100 patients undergoing total abdominal hysterectomy under TAP block. The institutional ethical committee approved the study. Patients were randomized and allotted to two groups by computer generated tables. An informed written consent was obtained from all the patients. Blinding was maintained as the person injecting the solution while giving TAP block was unaware of whether it is a placebo (normal saline) or ropivacaine as it was prepared by another person in operation theatre. As well as the person evaluating the VAS score was not knowing whether the subject had received ropivacaine or placebo (normal saline). Total 100 female patients undergoing total abdominal hysterectomy were randomized to undergo USG guided TAP block with ropivacaine (n =50) (Tap Block group versus placebo (n=50) (Control group). All patients underwent routine investigations such as complete blood count, coagulation profile, bleeding time, clotting time, ECG, LFT and KFT. If indicated further investigations were done in selected cases.

All patients received a standard general anesthesia with standard monitoring and a bilateral USG guided TAP block was performed using 0.75% ropivacaine (15 -20 ml on each side) or placebo (15 – 20 ml saline on each side). Same investigator performed TAP block in all the patients. Consent and fasting status was confirmed. In the operation theatre, patient was monitored with the blood pressure (Non-invasive blood pressure), Electrocardiogram, Monitor and Pulse-oximeter. Peripheral line was taken with 18G IV cannula (standard protocol). Appropriate preanesthetic medication was given. Patients received USG guided TAP block after induction before surgeon taking skin incision. Patient was positioned in the supine position. The abdominal wall was scanned using a linear array transducer probe (6-13 MHz) in the multibeam mode, connected to a portable ultrasound.21 G short-bevel 100 mm needle with tubing was advanced from an anterolateral to a medial direction using the in-plane insertion with ultrasound real-time assessment. The entry point was distant of the lateral side of the probe to obtain a needle-beam angle of more than 45 ensuring visibility of the entire needle during the procedure. The progression of the needle, visible as a bright hyperechoic line, was assessed under direct ultrasonography. The injection site was defined between aponeurosis of internal oblique and transverses abdominis muscle. When the tip was correctly located in the targeted plane, ropivacaine 0.75% (1.5 mg/kg) 15- 20 ml was injected with intermittent aspiration on each side in TAP group and 15 -20 ml of normal saline in control group. The correct placement of the needle was confirmed by expansion of the local anesthetic solution as a dark shadow between aponeurosis of the internal oblique (which moved anteriorly) and the transversus abdominis muscles pushing the muscle deeper.

Intraoperative monitoring of, Pulserate, Blood Pressure, SPO2 and ETCO2 was done. Patient vitals were monitored and looked for any complications every hourly for 1st 2 hours, every 2 hours up to 8 hours then at 12 hours,18 hours, 24 hours in PACU. Patient were supplemented with analgesics if V.A.S >4, and monitored for the time to first analgesic usage and also the total no. of analgesic doses required in first 24hrs. Sedation and nausea due to analgesic consumptions were observed and managed accordingly. This monitoring and evaluation was done by an independent observer. Postoperative pain, sedation score, duration of postoperative analgesia and nausea score were compared in both the groups. Statistical analysis was performed with SPSS version15. Chi square / Fischer exact test for categorical variables and student t test for continuous variables were used to detect significant difference in two groups. For non-normally distributed data, Wilcoxon signed rank

sum test was used to find the significant difference. At 95% confidence level, p values <0.05 was considered significant

Inclusion Criteria

1. Patient undergoing total abdominal hysterectomy and voluntarily giving written and informed consent about study.
2. ASA grade I & II.
3. All patients of age group 40 to 60 year.

Exclusion Criteria

1. Patient's refusal.
2. Uncontrolled systemic illnesses such as diabetes, hypertension or COPD.
3. Morbid obesity.
4. Coagulation abnormalities.
5. Peripheral vascular diseases.
6. Liver and kidney disease.
7. Allergy to local anesthetic and opioids.
8. History of receiving medical therapies considered to result in tolerance to opioids.
9. Patients with opioid dependence and opioid addiction.

Results

In our study, we enrolled total 100 patients of which 50 were in TAP block group and 50 were in control group. The mean age in TAP block group and control group was 49.5±5.3 and 50.5±5.6 respectively. There was no statistically significant difference in mean age (p= 0.393). Mean height and weight of the patients were also found to be comparable.

Table 1: Comparison of mean age, height and weight of patients

Group	TAP block (n=50)	Control (n=50)	P value
Age	49.5±5.3	50.5±5.6	0.393
Weight	54.3±4.0	51.1±3.7	0.103
Height	152.6±1.4	152.6±1.2	0.941

Mean duration of surgery in TAP block group was 87.6±5.6 and control group 88.2±4.9 respectively. There was no statistically significant difference in total duration required for surgery in two groups (p=0.569).

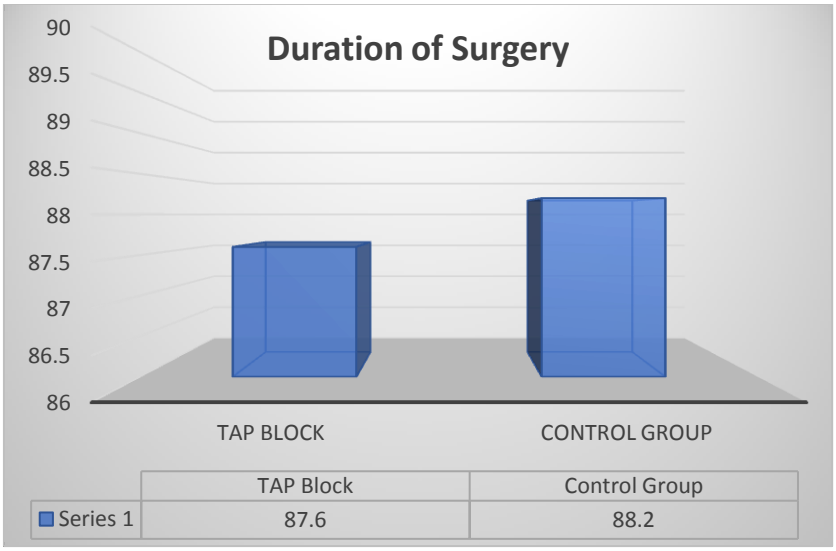

Figure 1: Duration of the surgery in both the groups.

The mean baseline heart rate in TAP block group was 73.9±2.3 and in control group was 75.2±3.9 which was comparable in both groups. The mean intraoperative heart rates of patients in both the groups were compared up to90 minutes. The control group was found to have a higher heart rate as compared to TAP block group at 5,10,15,20,30,40,50,60,75 and 90 minutes and the

difference was found to be statistically "highly significant" (P<0.0001). In Postoperative Period up to 24 hours control group was found to have a high heart rate as compared to TAP block group and the difference was found to be statistically "highly significant" (P<0.0001).

Table 2 Comparison of mean Intraoperative and postoperative heart rates in both the groups

Time Interval	Mean heart rate b/m		P value
	TAP Block	Control Group	
Intraoperative Heart Rate			
Baseline	73.9±2.3	75.2±3.9	0.169
5 minutes	83.6±3.2	92.1±1.7	<0.0001
10 minutes	77.5±3.3	87.0±2.6	<0.0001
15 minutes	77.4±3.1	84.7±2.3	<0.0001
20 minutes	71.1±3.0	84.3±2.3	<0.0001
30 minutes	72.0±3.1	85.0±2.6	<0.0001
40 minutes	74.4±5.0	86.3±3.2	<0.0001
50 minutes	73.7±4.6	85.1±3.0	<0.0001
60 minutes	71.5±2.9	85.2±2.8	<0.0001
75 minutes	74.2±5.2	87.2±3.0	<0.0001
90 minutes	83.1±3.0	91.7±1.8	<0.0001
Post-Operative Heart Rates			
1 hr	77.8±3.3	91.2±6.1	<0.0001
2 hr	75.2±3.0	80.9±7.1	<0.0001
4 hr	74.0±3.3	89.7±6.0	<0.0001
6 hr	74.5±4.7	85.3±6.4	<0.0001
8 hr	76.8±5.6	89.6±5.9	<0.0001
12 hr	72.2±4.6	87.2±5.8	<0.0001
18 hr	71.1±2.0	81.5±5.8	<0.0001
24 hr	71.0±2.1	76.2±6.3	<0.0001

The mean baseline systolic blood pressure in TAP block group was 113.1±3.0 and in control group it was 113.7±3.8 which was comparable in both groups. The mean intraoperative systolic blood pressures of patients in both the groups were compared up to90 minutes. The control group was found to have higher systolic blood pressure values as compared to TAP block group at 5,10,15,20,30,40,50,60,75 and 90 minutes and the difference was found to be statistically "highly significant" (P<0.0001). In Postoperative Period up to 24 hours control group was found to have a higher systolic blood pressure as compared to TAP block group and the difference was found to be statistically "highly significant" (P<0.0001).

Table 3: Comparison of mean intraoperative and postoperative systolic blood pressures in both the groups

Time Interval	Mean Systolic Blood Pressure in mm of Hg		P value
	TAP Block	Control Group	
Intraoperative Systolic Blood Pressure			
Baseline	113.1±3.0	113.7±3.8	0.387
5 minutes	124.8±3.1	130.4±1.6	<0.0001
10 minutes	118.0±2.2	126.8±1.6	<0.0001
15 minutes	115.1±2.9	125.1±2.4	<0.0001
20 minutes	112.7±2.3	124.2±2.4	<0.0001
30 minutes	112.0±3.1	124.2±3.0	<0.0001
40 minutes	114.4±5.0	125.6±2.8	<0.0001
50 minutes	113.3±4.1	124.4±3.4	<0.0001
60 minutes	110.3±3.1	124.2±3.5	<0.0001
75 minutes	113.6±5.6	126.2±3.6	<0.0001
90 minutes	121.6±3.7	130.2±1.4	<0.0001

Post-Operative Systolic Blood Pressure			
1 hrs	115.9±3.3	128.6±1.4	<0.0001
2 hrs	114.5±2.8	120.3±2.9	<0.0001
4 hrs	113.6±3.3	127.9±1.8	<0.0001
6 hrs	114.1±4.7	123.9±3.7	<0.0001
8 hrs	116.0±5.7	127.5±1.5	<0.0001
12 hrs	111.4±5.0	126.3±3.7	<0.0001
18 hrs	110.2±2.1	119.1±2.7	<0.0001
24 hrs	111.0±3.0	113.5±3.5	<0.0001

The mean baseline Diastolic blood pressure in TAP block group was 65.0±3.4 and in control group it was 66.4±3.0 which was comparable in both groups. The mean intraoperative diastolic blood pressures of patients in both the groups were compared up to 90 minutes. The control group was found to have higher Diastolic blood pressure values as compared to TAP block group at 5,10,15,20,30,40,50,60,75 and 90 minutes and the difference was found to be statistically "highly significant" (P<0.0001). In Postoperative Period up to 24 hours control group was found to have a higher diastolic blood pressure as compared to TAP block group and the difference was found to be statistically "highly significant" (P<0.0001).

Table 4: Comparison of mean Intraoperative and postoperative Diastolic blood pressures in both the groups

Time Interval	Mean Diastolic Blood Pressure in mm of Hg		P value
	TAP Block	Control Group	
Intraoperative Diastolic Blood Pressure			
Baseline	65.0±3.4	66.4±3.0	0.162
5 minutes	70.3±3.6	80.8±2.6	<0.0001
10 minutes	67.4±3.6	76.5±3.4	<0.0001
15 minutes	64.9±9.0	74.9±3.1	<0.0001
20 minutes	63.8±3.4	74.4±3.2	<0.0001
30 minutes	63.0±3.9	74.5±3.1	<0.0001
40 minutes	63.6±4.3	74.4±3.5	<0.0001
50 minutes	63.7±4.2	74.7±3.7	<0.0001
60 minutes	61.5±3.6	75.0±3.4	<0.0001
75 minutes	63.9±4.2	77.6±3.0	<0.0001
90 minutes	68.2±3.4	80.5±2.1	<0.0001
Post-Operative Diastolic Blood Pressure			
1 hrs	66.5±3.4	81.0±3.2	<0.0001
2 hrs	65.6±3.3	72.0±3.2	<0.0001
4 hrs	64.4±3.6	78.5±4.1	<0.0001
6 hrs	63.7±4.4	75.6±4.6	<0.0001
8 hrs	66.0±4.3	78.3±3.4	<0.0001
12 hrs	63.4±3.7	77.3±4.4	<0.0001
18 hrs	61.4±3.5	71.9±3.1	<0.0001
24 hrs	62.0±3.3	69.8±2.7	<0.0001

The mean baseline Mean Arterial Pressure in TAP block group was 81.1±2.7 and in control group it was 81.2±2.2 which was comparable in both groups. The intraoperative mean arterial pressures of patients in both the groups were compared up to 90 minutes. The control group was found to have higher Mean arterial pressure values as compared to TAP block group at 5,10,15,20, 30,40,50,60,75 and 90 minutes and the difference was found to be statistically "highly significant" (P<0.0001). In Postoperative Period up to 24 hours control group was found to have a higher mean arterial pressure as compared to TAP block group and the difference was found to be statistically "highly significant" (P<0.0001).

Table 5: Comparison of Intraoperative and postoperative mean arterial pressures in both the groups

Time Interval	Mean Arterial Pressure in mm of Hg		P Value
	TAP Block	TAP Block	
Intraoperative Mean Arterial Pressure			
Baseline	81.1±2.7	81.2±2.2	0.199
5 minutes	88.4±2.9	97.3±1.9	<0.0001
10 minutes	84.2±2.4	93.2±2.4	<0.0001
15 minutes	81.6±6.2	91.6±2.2	<0.0001
20 minutes	80.1±2.4	91.0±2.3	<0.0001
30 minutes	79.3±2.8	91.1±2.4	<0.0001
40 minutes	80.5±3.6	91.5±2.7	<0.0001
50 minutes	80.2±3.6	91.2±2.8	<0.0001
60 minutes	77.7±2.9	91.4±2.9	<0.0001
75 minutes	80.5±3.9	93.8±2.6	<0.0001
90 minutes	86.0±3.0	97.1±1.5	<0.0001
Post-Operative Mean Arterial Pressure			
1 hrs	83.0±2.5	96.9±2.4	<0.0001
2 hrs	81.9±2.6	88.1±2.5	<0.0001
4 hrs	80.8±2.8	95.0±2.9	<0.0001
6 hrs	80.5±4.1	91.7±4.1	<0.0001
8 hrs	82.7±4.4	94.7±2.4	<0.0001
12 hrs	79.4±3.4	93.6±3.8	<0.0001
18 hrs	77.7±2.5	87.6±2.6	<0.0001
24 hrs	78.3±3.0	84.4±2.4	<0.0001

Intraoperative as well as postoperative mean SPO2 levels up to 90 minutes were found to be comparable in both the groups with no statistically significant difference in SPO2 levels at any time (P>0.05).

Table 6: Comparison of Intraoperative and postoperative SPO2 levels in both the groups

Time Interval	SPO2 In Percentage		P Value
	TAP Block	TAP Block	
Intraoperative SPO2			
Baseline	100.0	100.0	-
5 minutes	100.0	100.0	-
10 minutes	99.94±	99.92	0.699
15 minutes	99.86	99.82	0.590
20 minutes	99.70	99.70	-
30 minutes	99.67	99.68	0.847
40 minutes	99.62	99.74	0.202
50 minutes	99.72	99.62	0.313
60 minutes	99.64	99.62	0.844
75 minutes	99.67	99.74	0.388
90 minutes	99.73	99.80	0.496
Post-Operative SPO2 In Percentage			
1 hrs	100.0±0.0	100.0±0.0	-
2 hrs	99.90±0.14	100.0±0.0	0.320
4 hrs	99.80±0.45	99.90±0.32	0.314
6 hrs	99.70±0.68	99.90±0.33	0.094
8 hrs	99.80±0.43	99.60±0.53	0.151
12 hrs	99.66±0.52	99.8±0.39	0.084
18 hrs	99.66±0.48	99.64±0.49	0.836
24 hrs	99.88±0.33	99.90±0.30	0.752

Intraoperative mean ETCO2 levels up to 90 minutes were found to be comparable in both the groups with no statistically significant difference in SPO2 levels at any time (P>0.05).

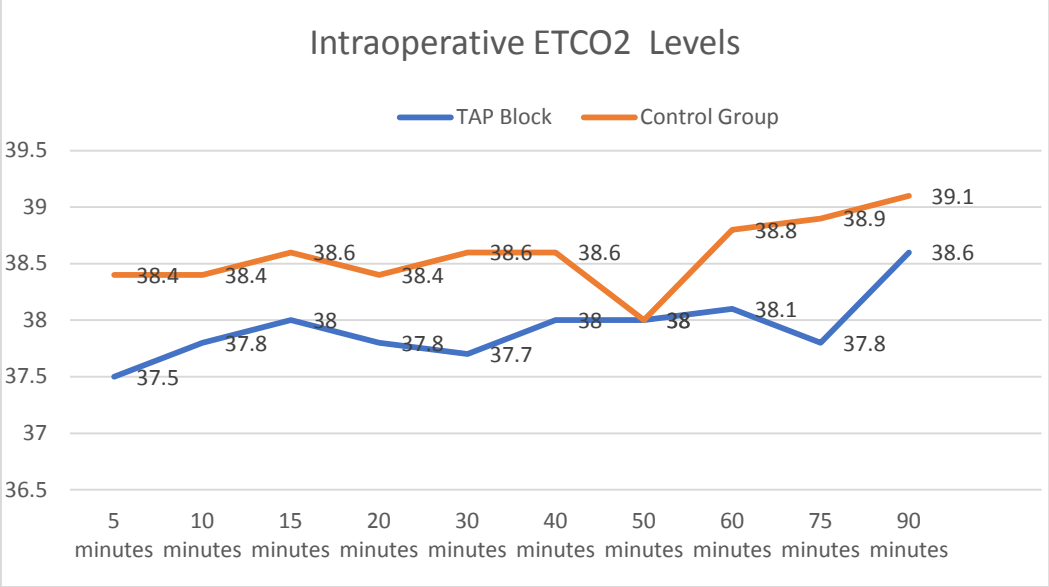

Figure 2: Intraoperative ETCO2 levels in studied cases

The analysis of VAS scores of the patients in post-operative period showed that Median VAS score at 1st hr was 3.0 (3.0, 3.0) and 5.0 (5.0, 6.0) in TAP block group and Control group respectively and the difference was statistically significant. (p<0.0001). The comparison of VAS Scores up to 24 hours showed that patients in TAP block group had lower Median VAS scores as compared to Control group (P<0.05) up to 24 hours except at 2hrs, 18 hrs and 24 hrs at which VAS scores in both the groups were found to be comparable with no statistically significant difference (P>0.05).

Table 8: Comparison of Median VAS scores in both the groups

Time Interval	Median VAS Scores		P value
	TAP Block	Control Group	
1 hr	3.0 (3.0, 3.0)	5.0 (5.0, 6.0)	<0.0001
2 hr	3.0 (3.0, 3.0)	3.0 (3.0, 3.0)	0.475
4 hr	3.0 (3.0, 3.0)	5.0 (5.0, 6.0)	<0.0001
6 hr	3.0 (3.0, 3.0)	4.5 (3.0, 5.0)	<0.0001
8 hr	4.0 (2.0, 4.0)	4.0 (4.0, 5.0)	<0.0001
12 hr	2.0 (2.0, 2.0)	4.0 (4.0, 4.0)	<0.0001
18 hr	1.0 (1.0, 1.0)	1.0 (1.0, 2.0)	0.241
24 hr	0.0 (0.0, 1.0)	1.0 (1.0, 1.0)	0.058

Time to first request of rescue analgesic was significantly early in control group (1.00hour) than TAP block group (8.15 hour) and the difference was statistically significant (p<0.0001). Also, mean dose of RA required in 24-hour postoperative period was significantly lesser with TAP block than control group (54.5±4.0 Vs234.9±31.4, p<0.0001).

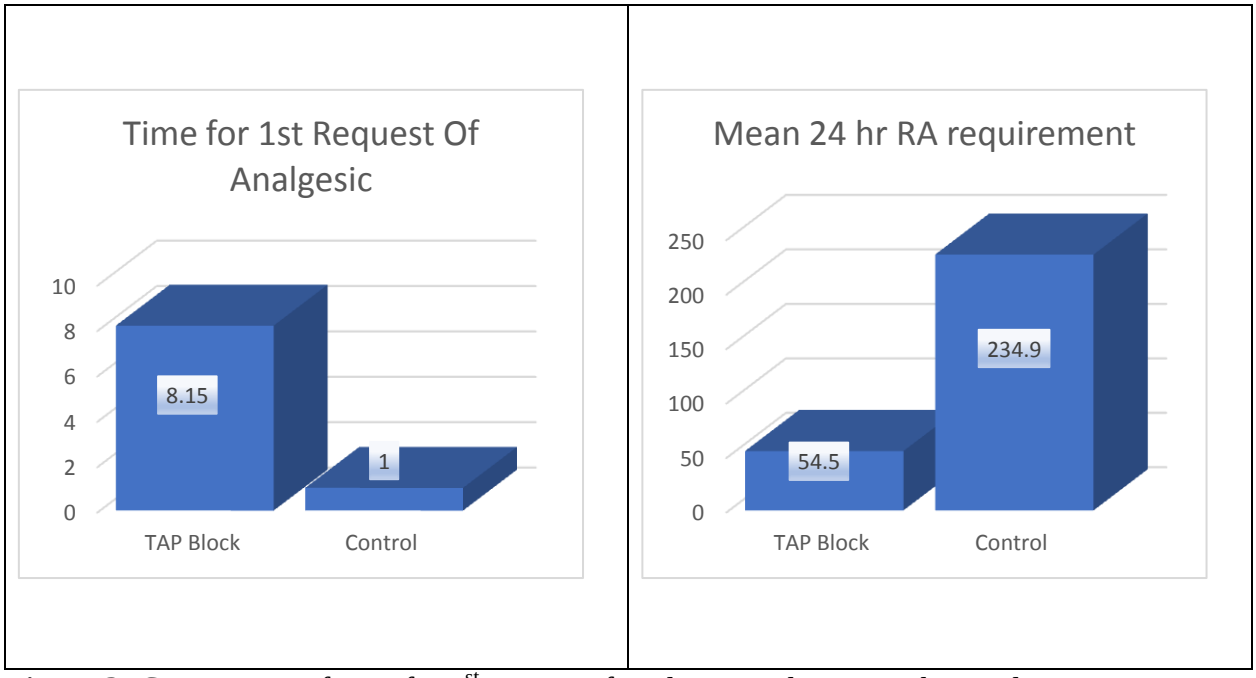

Figure 3: Comparison of time for 1st request of analgesia and mean 24 hrs analgesia requirement

At different time intervals in 24-hour postoperative period, mean sedation score was significantly lower in TAP block group compared to control group during first 6 hours (P<0.05) but it was non-significant after 6-hour duration (P>0.05).

Table 9: Comparison of Mean Sedation scores in both the groups

Time Interval	Median sedation score		P value
	TAP Block	Control Group	
1 hr	2.0 (2.0, 2.0)	3.0 (3.0, 3.0)	<0.0001
2 hr	2.0 (2.0, 2.0)	2.0 (2.0, 2.0)	<0.0001
4 hr	2.0 (2.0, 2.0)	2.0 (2.0, 2.0)	<0.0001
6 hr	2.0 (1.0, 2.0)	2.0 (2.0, 2.0)	0.026
8 hr	1.0 (1.0, 2.0)	2.0 (2.0, 2.0)	0.059
12 hr	1.0 (1.0, 1.0)	1.0 (1.0, 2.0)	0.139
18 hr	1.0 (1.0, 1.0)	1.0 (1.0, 1.0)	0.610
24 hr	1.0 (1.0, 1.0)	1.0 (1.0, 1.0)	1.000

At 1 hour, one and three patients from TAP block and control group had PONV which was nonsignificant statistically. At 6 hours, PONV was seen in 2% Vs 22% patients from two groups respectively, and the difference in proportions was significant statistically (p=0.004). At 8-hour, difference of patients developing PONV was not significantly different (14% Vs 26%, p=0.134). However, at 12 hours, 10% from TAP group and 44% from control group developed PONV and there was significant difference note with p<0.0001.Postoperative at 1 hour, one patient from TAP block group and three patients from control group had nausea and vomiting which was nonsignificant statistically (0.617).

Table 10: Post-operative nausea and vomiting (PONV) score at different interval

Time Interval	Post-operative nausea and vomiting (PONV)		P value
	TAP Block	Control Group	
1 hrs	1 (2%)	3 (6%)	0.617
2 hrs	0	0	-
4 hrs	0	3 (6%)	-
6 hrs	1 (2%)	11 (22%)	0.004
8 hrs	7 (14%)	13 (26%)	0.134
12 hrs	5 (10%)	22 (44%)	< 0.0001
18 hrs	0	0	-
24 hrs	0	0	-

Discussion

We studied 100 ASA physical status I & II patients scheduled for elective total abdominal hysterectomy in a randomized, double-blind, controlled clinical study. All 100 patients undergoing total abdominal hysterectomy were randomized to undergo TAP block with 0.75% ropivacaine (N = 50) [TAP block group] versus placebo (N = 50) [Control group].In our study, we enrolled total 100 patients of which 50 were in TAP block group and 50 were in control group. There was no statistically significant difference in mean age (p=0.393), mean weight (p=0.103) and mean height (p=0.941) of patients in two groups. Mean duration of surgery in TAP block group was 87.6±5.6 and control group 88.2±4.9. There was no statistically significant difference in total duration required for surgery in two groups (p=0.569).As regards with intraoperative hemodynamics, present study results were inaccordance with the study done by Sulagna B et al[8]in which they studied hemodynamic response to skin incision and intraoperative fentanyl consumption. They found that pulse rate (95.9±11.2 bpm vs 102.9±8.8bpm, p=0.001), systolic and diastolic blood pressure was significantly higher in control group. Similar findings were reported by Sivapurapu et al[9] and Calle GA et al[10]

In accordance with present study, Carney J et al[11] observed that TAP block with ropivacaine reduced postoperative visual analogous scale pain scores compared to placebo block. Belavy D [et] al[12] found no significant difference in the VAS pain score. The median (IQR) pain score was 26.5 (20) mm in the placebo group and 23.0 (21) mm in the active group (P¼0.17) but median (IQR) satisfaction scores were 96 (17) and 77 (21) mm in the active and placebo groups, respectively.

According to Amr Y M[13] found that postoperative pain scores at rest in 2, 4, 8, 12, 24, 48 h were statistically significantly higher in the post-surgical TAP block group than those in the pre-incisional TAP block group (P<0.05) but Both groups demonstrated significantly lower pain scores than the control group at all time points assessed. Similar findings were reported by Nomaghave M et al[14] and Manjaree M et al[15.]

Present study is in accordance with the study done by Bidhan P (2014) [16]. In their study they found that pain VAS scores at rest were significantly lower (i.e. better controlled) in TAP group than NON TAP group and it was with highly significance of difference (p=0.001) at 1st, 2nd, 4th and 24th hr. of postoperative time points but very significant (p=0.01) at 6th and 12th hr time points. VAS scores at movement were lower in TAP group with highly significant value of difference (p=0.001) at all postoperative time points. Similar lower VAS scores in TAP groups were reported by Paul T et al[17]and Young M J et al [18].

Present study is in accordance with the study done by Carney J et al[11], they found that, the median (interquartile range) time to first request for morphine was significantly longer in a patient who receive TAP Block (45 mint in tap block group Vs 12.5 mint in control group) and patients undergoing TAP block had reduced 48 hr morphine requirement (26.8±19.8 mg in tap block

group vrs 55.3 ±17.6 mg in control group). Similar findings were reported by the authors such as Priya S et al[19] and

Bidhan et al P[16]found that first I/V morphine requirement mean time ± SD was 271.23±40.34 (range 175-355) minutes in group A (TAP Block) and 195.33±22.16 (range 165-270) minutes in group B (Control Group). It was of highly significance of difference (p=0.001).

Postoperative mean consumption of I/V morphine was lower (p=0.001HS) in group A than group B at all times up to 24th hr. The range of total 24hrs I/V morphine requirement was 10-28mg in group A (TAP Block) and 20-35mg in group B (Control Group).

Present study showed that prevalence of PONV between two groups was statistically significant at 6th and 12th postoperative hours (2% vs 22% at 6th hour and 10 % vs 44% at 12th hour in group T and group c respectively. Present study results were in accordance with the study carried by Carney J et al[11] They found no significant difference in the incidence or severity of nausea between groups at any time point and the TAP block significantly reduced the incidence of sedation, from 63% in the control group to 37% in the TAP group. Similar findings were also reported by Liu L et al[20].

Conclusion

TAP block is a promising technique in alleviating postoperative pain in patients undergoing lower abdominal gynecological surgeries especially when used as part of multi-modal analgesia regimen. The procedural simplicity of this block, along with reliable level of analgesia, longer duration as well as good quality with lesser rescue analgesics requirement and their side-effects makes the TAP block a good option for lower abdominal gynecological surgeries.

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