Comparitive Study Of Dexamethasone Vs Clonidine As An Adjuvant To Levobupivacaine In Transversus Abdominis Plane Block For Postoperative Pain In Patients Undergoing Total Abdominal Hystrectomy

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Abstract

Introduction: Transversus abdominis plane (TAP) block is a regional anaesthetic technique in which a local anaesthetic agent is deposited in the TAP to block the sensory nerves supplying the anterior abdominal wall.[1] TAP block has been used successfully for pain relief after Total Abdominal Hysterectomy (TAH),which in turn improved surgical outcome and decreases patient's morbidity.

Aim: To compare the effect of 0.25% Levobupivacaine with 8mg Dexamethasaone (group LD) and 0.25% Levobupivacaine with 1.0 µg/kg bodyweight of Clonidine (group LC) on the duration of post-operative analgesia.

Method: A prospective randomized double-blinded comparative study was conducted, involving hundred ASA I and II, adult patients posted for elective Total Abdominal Hysterectomy under general anaesthesia.The patients were randomly divided into two groups LD and LC, each comprising of fifty patients Group LD received 0.25% Levobupivacaine with 8mg Dexamethasaone and Group LC received 0.25% Levobupivacaine with 1.0 µg/kg bodyweight of Clonidine. USG guided TAP block was performed under all aseptic precautions, in the lumbar triangle of Petit bilaterally once the surgery has ended before extubation. The block effects in the two groups under study were compared in terms of postoperative Numeric Pain Rating scale (NPRS), duration of analgesia (time for first rescue demand) in the postoperative period upto 24 hours, number of demands for rescue analgesics, haemodynamic parameters like HR, SBP and DBP.

Results: The demographic profile of patient in both the groups was similar with regard to age, sex, weight, BMI and ASA grade. NPRS was significanly lower in LD group at 1,2,4,6,8 and 12 hours postopertaively as compared to LC group. The time of first rescue analgesia was longer in LD group (626.40±40.93 minutes) versus LC-Group (403.40±31.63 minutes). The haemodynamaic parameters and arterial oxygen saturation of both the groups were comparable.

Conclusion: Dexamethasone as adjuvant to 0.25% levobupivacaine (LD) reduces postoperative pain scores, prolongs the duration of analgesia and decreases demands for rescue analgesia in ultrasound guided transversus abdominis plane block in comparison to 0.25% levobupivacaine with clonidine (LC) without any clinically significant adverse effects.

INTRODUCTION

Total abdominal hysterectomy (TAH) is very commonly done surgery for various pathologies. Adequate post-operative analgesia is indispensible as it slash down post-operative morbidity and improves surgical outcome. An important component of pain and discomfort is expected from the abdominal wall incision.[2] Regional anaesthetic techniques such as local anaesthetic infiltration, ilioinguinal nerve blocks, abdominal field blocks, and transversus abdominis plane (TAP) blocks have been described to alleviate pain from the abdominal wall incision.

TAP block is a regional anaesthetic technique in which a local anaesthetic agent is deposited in the TAP to block the sensory nerves supplying the anterior abdominal wall.[1] TAP block has been used successfully for pain relief after Total Abdominal Hysterectomy (TAH).[2]

AIMS AND OBJECTIVES

To compare the effect of 0.25% Levobupivacaine with 8mg Dexamethasaone (group LD) and 0.25% Levobupivacaine with 1.0 µg/kg bodyweight of Clonidine (group LC) on the duration of post-operative analgesia.

PRIMARY OBJECTIVE

To compare the duration of analgesia post operatively with Dexamethasone and Clonidine as adjuvant to levobupivacaine in TAP block in Total Abdominal Hysterectomy**.**

SECONDARY OBJECTIVE

1. To compare total analgesic requirement in 24 hrs period post- operatively.
2. To evaluate any additional effects and complications of Dexamethasone and Clonidine in TAP Block.

STUDY DESIGN:

Ethics

The study was undertaken after obtaining Institutional Ethics Committee clearance as well as informed written consent from all the patients.

INCLUSION AND EXCLUSION CRITERIA

Hundred ASA I and II, adult patients aged thirty to sixty years posted for elective Total Abdominal Hysterectomy under general anaesthesia were enrolled in the study. Patients with drug allergy to the study drugs, ASA grade III, IV or V and patients with any coagulation disorders were excluded from the study.

RANDOMISATION

The patients were randomised using coded sealed envelopes computer generated, and subsequently participants were allocated to one of the two groups named LD and LC of fifty patients each.

- Group LD received 0.25% Levobupivacaine with 8mg Dexamethasaone.
- Group LC received 0.25% Levobupivacaine with 1.0 µg/kg bodyweight of Clonidine.

Total solution in each group was made 40 ml with addition of normal saline.

BLINDING

Double blinding of the study was ensured as the patient and the anaesthesiologist administering the TAP block and involved in data collection were also blinded to group assignment. The code was broken after the completion of the study and statistical analysis.

METHODOLOGY

All the patients entering the study were subjected to a detailed pre anaesthetic evaluation to rule out the presence of any significant co-morbidity.

Patients were given tablet Alprazolam 0.5mg and tablet Ranitidine 150mg night prior to the surgery and on the morning of surgery and were advised minimum 8 hrs of fasting (NPO).

After shifting the patient to the operation theatre, non- invasive blood pressure monitors, pulse oximeter probe and electrocardiographic leads were attached. Intravenous line was secured and fluid infusion was started. Patients were allocated to the respective groups**.** The study drug was prepared and coded by an anaesthesiologist not involved in the study. Patients were then made familiar with 0-10 numeric pain rating scale for pain with 0 representing no pain and 10 representing worst imaginable pain, before administering the block. Premedication was done with injection fentanyl in a dose of 2mcg/kg body weight followed by preoxygenation with 100% oxygen for three minutes. Induction was done by injection propofol (2mg/kg body weight) and after ensuring bag and mask ventilation, patient was intubated following neuromuscular blockade with Inj. Vecuronium 0.1 mg/kg I.V. Anaesthesia was maintained with inhalational agent isoflurane and intermittent positive pressure ventilation with nitrous oxide and oxygen in the ratio of 60%: 40% using circle absorber system connected to the Anaesthesia work station (Drager fabius plus). Neuromuscular blockade was sustained with Inj. Vecuronium in aliquot doses.

After the conclusion of the surgery, under all aseptic precautions TAP block was performed bilaterally in the lumbar triangle of Petit. The patient was placed in supine position. The ultrasound probe was placed transversely in the horizontal plane along the lateral abdominal wall at the mid-axillary line, midway between the iliac crest and lower costal margin. At this level, the three muscles were easily distinguished. After obtaining an optimal Ultrasound view, a needle was inserted in an antero- posterior direction.

The needle was then advanced using an in-plane approach into the TAP. After negative aspiration to exclude vascular puncture, a small amount of local anaesthetic was injected to confirm correct needle placement, then total volume of solution 40ml (0.25% levobupivacaine with adjuvant) was administered bilaterally, 20 ml on each side.

The local anaesthetic appeared hypoechoic as it displaced the internal oblique superiorly and the transverses abdominis muscle inferiorly.

During the conduct of block and thereafter, the patient was observed vigilantly for any complications of the block (like intravascular injection) and for the toxicity of the drugs injected (like Bradycardia, hypotension, nausea, vomiting, itching, etc). Completion of injection was taken as time 0- (T_0).

After the TAP block, neuromuscular blockade was reversed with Inj. Neostigmine (0.05mg/kg) and Inj. Glycopyrrolate (0.008mg/kg). All the patients were followed in the post-operative period.

The patients were monitored for heart rate (HR), non-invasive measurements blood pressure (NIBP), mean arterial blood pressure (MAP) at an interval of 5 minutes for first half an hour and thereafter every 15 minutes for 1 hour. Electrocardiographic (ECG) and hemoglobin oxygen saturation (SPO_2) were monitored continuously.

The duration of postoperative analgesia, defined as the time (in hours) from the giving of the TAP block to the time to the first analgesic request in the postoperative period was recorded. Degree of pain was observed using the Numeric Pain Rating Scale (0 for no pain and 10 for worst pain imaginable) at 30 minutes, 1 hour, 2 hours, 4 hours, 6 hours, 8 hours, 12 hours, 18 hours and 24 hours. The TAP block was deemed a failure if the patient requested analgesia within the first 2 hour of administering the block, and the case was not included in analyses. Patients were given Injection diclofenac 1.5 mg/kg intravenous (to a maximum of 3 mg/kg/day) on demand or if the NPR scale will be ≥ 4.

A note was made of the total analgesic consumption in the first twelve hours after the block. All the observations were made by an anaesthesiologist who was unaware of group allocation and blind to the study drug.

STATISTICAL ANALYSIS

Statistical tests were conducted on Statistical Package for the Social Sciences (SPSS) software program, version 23.0 (IBM, New York USA). Continuous data were presented as mean (standard deviation [SD]) and discrete numbers were taken as percentages and proportion. Unpaired *t* test was used to compare mean and Chi-square test was used to compare percentages based on the assumption that population at source were equally distributed. Graphs were plotted in Microsoft Word 2016 sheets. A value of $P < 0.025$ was considered statistically significant.

OBSERVATION AND RESULTS

Patient Demography

The demographic profile of patient in the both groups was similar with regard to age (years) (p value = 0.5984), sex (p value=0.0000), weight (kg) (p value =0.8638) height (cm) (p value =0.7575), BMI (p value = 0.9264) and ASA grade (p value =0.2482) (Table 1)

Table 1: Age, Weight, Height, BMI, distribution (Mean±SD), Sex and ASA grade (Number and percentage of patients)

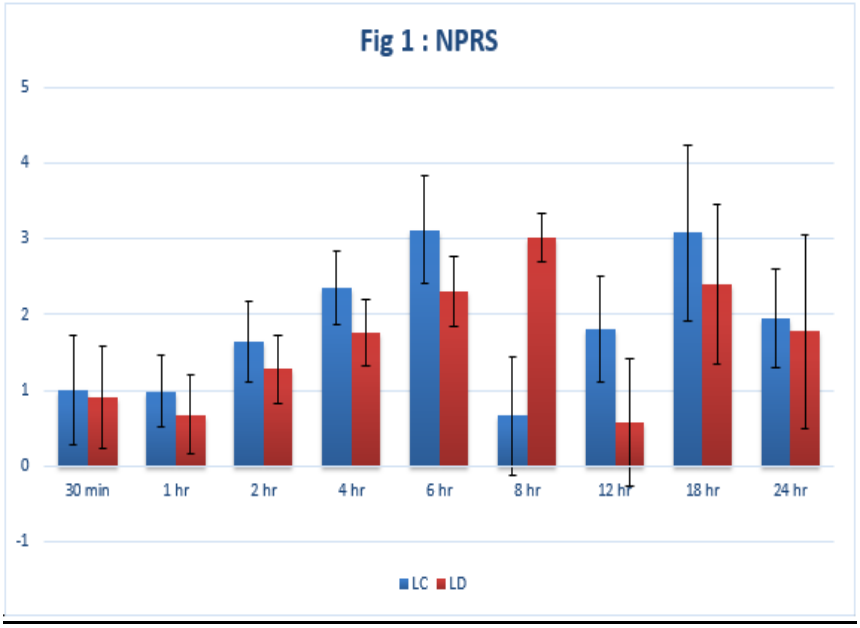
VARIABLES	LD GROUP	LC GROUP	p-VALUE
Age(yrs)	44.60±5.71	43.98±6.02	0.5984
Sex (F), n (%)	50 (100.0%)	50 (100.0%)	0.9999
Weight(kg)	58.98±5.34	59.18±6.25	0.8638
Height(cm)	158.98±5.75	159.32±5.22	0.7575
BMI(kg/m^2)	23.42±2.64	23.37±2.76	0.9264
ASA (I/II), n(%)	40/10 (80.0/20.0)	35/15 (70.0/30.0)	0.2482

NPRS

In case of NPRS , the distribution of two groups was comparable, highly statistically significant difference was found at 1, 2, 4, 6, 8, 12, and 18 hours. At 1 hour, the NPRS of LD-Group had mean of 0.68±0.51 while that of LC-Group was 0.98±0.47, (*P* =0.0029). And at 18 hours, the mean NPRS of LD-Group was 2.40±1.05 while that of LC-Group was 3.08±1.16, (*P* =0.0027). (Table 2 and figure 1)

Table 2: NPRS

Time	LD GROUP	LC GROUP	p Value
30 min	0.90±0.68	1.00±0.73	0.4801
1 hr	0.68±0.51	0.98±0.47	0.0029
2 hr	1.28±0.45	1.64±0.53	0.0004
4 hr	1.76±0.43	2.36±0.48	0.0001
6 hr	2.30±0.46	3.12±0.72	0.0001
8 hr	3.02±0.32	0.66±0.77	0.0001
12 hr	0.58±0.84	1.80±0.70	0.0001
18 hr	2.40±1.05	3.08±1.16	0.0027
24 hr	1.78±1.28	1.94±0.65	0.4325

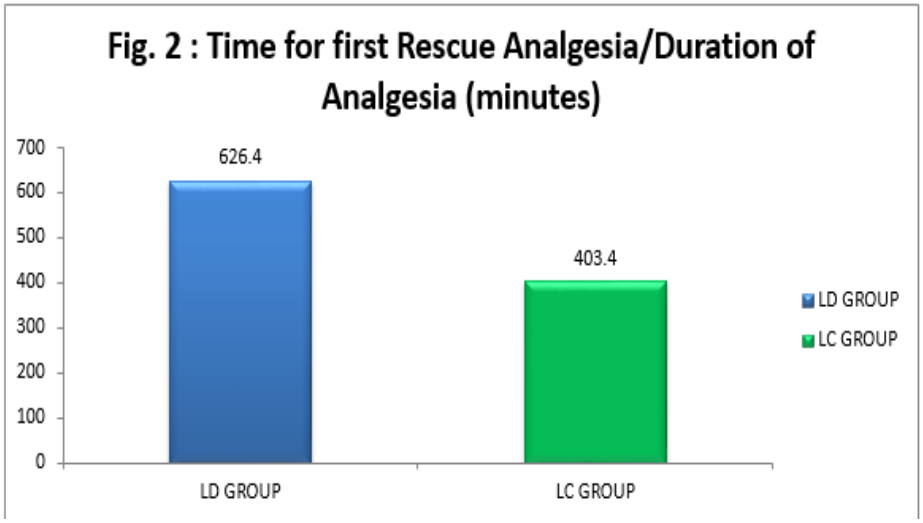


ANALGESIA

In case of analgesia, the distribution of LD and LC groups were comparable. It was found that the values obtained at the time for first rescue analgesia (minutes) and duration of analgesia (minutes) had significant difference. At the time for first rescue analgesia (minutes), the mean analgesia of LD-Group had mean of 626.40±40.93 while that of LC-Group was 403.40±31.63, respectively (P <0.0001) (Fig.17). And at duration of analgesia (minutes), the mean analgesia of LD-Group had mean of 626.40±40.93 while that of LC-Group was 403.40±31.63, respectively (P< 0.0001). (Table 3, Fig.2)

Table 3: ANALGESIA (Mean+/-SD)

Time	LD GROUP	LC GROUP	p Value
Time for first Rescue Analgesia (minutes)	626.40±40.93	403.40±31.63	<0.0001
Duration of Analgesia (minutes)	626.40±40.93	403.40±31.63	<0.0001
Number of Rescue Analgesia in 12 hours	1.00±0.00	1.02±0.14	0.0000

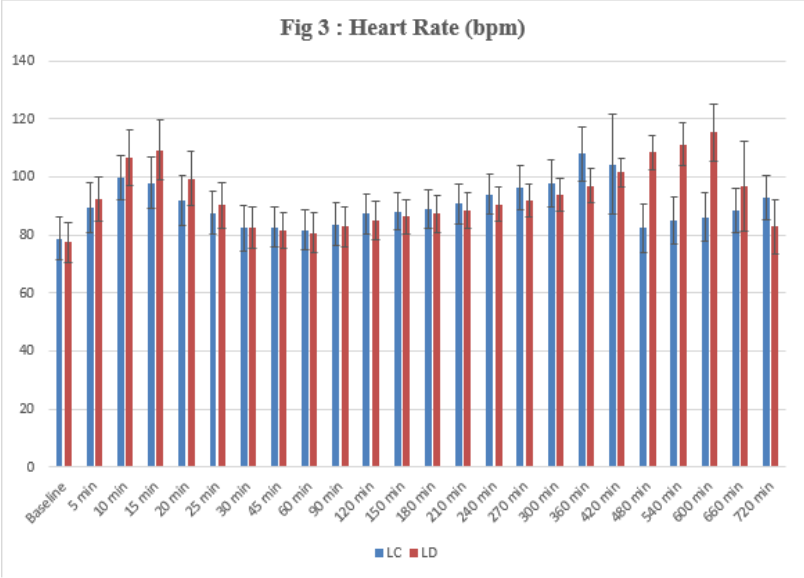


HEART RATE

The distribution of age and weight amongst the two groups were comparable. On comparing the heart rates at Baseline, 5, 10, 15, 20, 25, 30, 35, 40, 45, 60, 90, 120, 150, 180, 210, 240, 270, 300, 360, 420, 480, 540, 600, 660 and 720 minutes, it was found that the values obtained at 5, 10, 15, 20, 240, 270, 300, 360, 480, 540, 600, 660 and 720 minutes had significant difference. At 5 minutes, the mean heart rate of LD-Group had mean of 92.42±7.43 while that of LC-Group was 89.22±8.61, respectively (P = 0.0494). And at 720 minutes, the mean heart rate of LD-Group had mean of 82.88±9.32 while that of LC-Group was 92.80±7.63, respectively (P = 0.0001). (Table 4 and Figure 3)

Table 4: Heart Rate (Mean+/-SD)

Time	LD GROUP	LC GROUP	p Value
Baseline	77.48±6.91	78.80±7.27	0.3544
5 min	92.42±7.43	89.22±8.61	0.0494
10 min	106.48±9.59	99.62±7.71	0.0002
15 min	109.18±10.31	98.02±8.71	0.0001
20 min	99.36±9.40	92.04±8.57	0.0001
25 min	90.36±7.84	87.50±7.40	0.0637
30 min	82.44±7.16	82.36±7.75	0.9574
45 min	81.56±6.28	82.68±6.80	0.4309
60 min	80.82±6.85	81.78±6.91	0.4690
90 min	82.88±6.95	83.66±7.43	0.5890
120 min	85.08±6.78	87.30±6.71	0.1030
150 min	86.46±5.88	88.10±6.43	0.1863
180 min	87.26±6.31	88.90±6.76	0.5089
210 min	88.40±6.19	90.72±6.76	0.0766
240 min	90.64±5.87	93.90±6.92	0.0126
270 min	92.04±5.65	96.32±7.76	0.0021
300 min	93.78±5.80	97.82±8.24	0.0056
360 min	97.02±5.76	107.98±9.35	0.0001
420 min	101.54±5.08	104.36±17.26	0.2704
480 min	108.36±5.93	82.36±8.46	0.0001
540 min	111.20±7.49	85.04±8.08	0.0001
600 min	115.24±9.73	86.10±8.36	0.0009
660 min	96.82±15.57	88.40±7.56	0.0155
720 min	82.88±9.32	92.80±7.63	0.0001

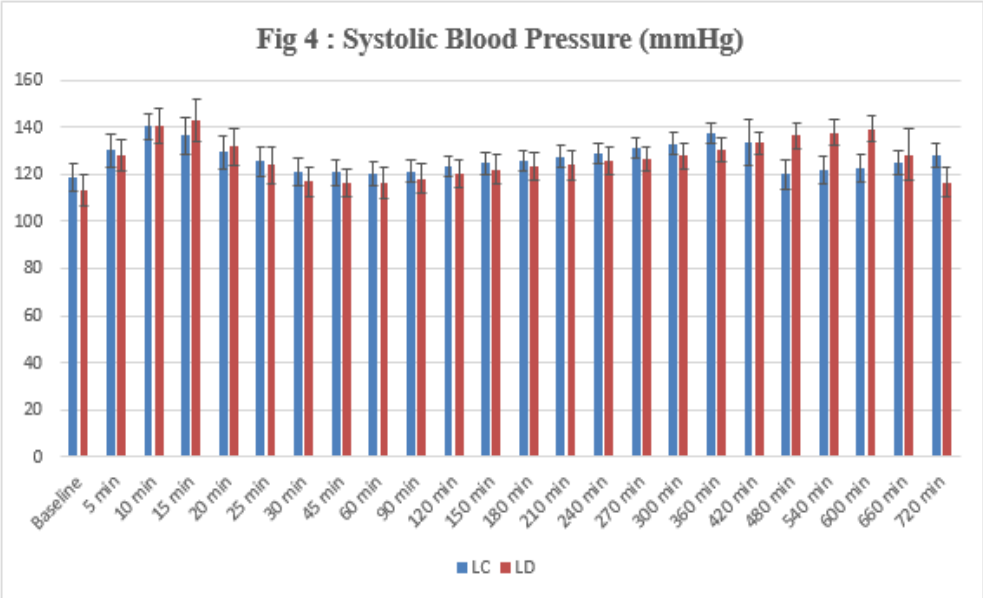


Systolic Blood Pressure

The mean systolic blood pressure (mm Hg), the distribution of two groups was comparable. On comparing the systolic blood pressure at baseline, 5, 10, 15, 20, 25, 30, 35, 40, 45, 60, 90, 120, 150, 180, 210, 240, 270, 300, 360, 420, 480, 540, 600, 660 and 720 minutes, it was found that the values obtained at baseline, 15, 30, 35, 40, 45, 60, 90, 120, 150, 180, 210, 240, 270, 300, 360, 480, 540, 600, and 720 minutes had statistically significant. At baseline, the mean systolic blood pressure of LD-Group had mean of 113.28±6.52 while that of LC-Group was 118.44±5.94, (*P* =0.0001). At 90 minutes, the mean systolic blood pressure of LD-Group was 118.22±6.18 while that of LC-Group was 121.34±4.97, (*P* =0.0065). And at 720 minutes, the mean systolic blood pressure of LD-Group had mean of 116.72±6.54 while that of LS-Group was 128.16±4.80, (*P* =0.0001). (Table 5 and figure 4)

Table 5: SBP (Mean+/-SD)

Time	LD GROUP	LC GROUP	p Value
Baseline	113.28±6.52	118.44±5.94	0.0611
5 min	128.34±6.72	130.32±7.10	0.1433
10 min	140.82±7.48	140.28±5.57	0.6831
15 min	142.62±8.89	136.40±7.79	0.0003
20 min	131.80±7.83	129.28±6.78	0.0885
25 min	123.76±7.58	125.56±6.18	0.1962
30 min	117.00±6.16	121.00±5.73	0.0011
45 min	116.26±5.93	121.00±5.44	0.0001
60 min	116.20±6.70	120.16±5.30	0.0014
90 min	118.22±6.18	121.34±4.97	0.0065
120 min	120.30±6.01	123.48±4.27	0.0029
150 min	122.16±5.93	124.60±4.36	0.0211
180 min	123.18±5.96	125.84±4.46	0.0131
210 min	123.96±6.08	127.60±4.46	0.0009
240 min	125.86±5.65	128.92±4.06	0.0025
270 min	126.72±5.23	130.96±4.28	0.0001
300 min	127.92±5.42	132.88±4.73	0.0001
360 min	130.54±4.92	137.24±4.24	0.0001
420 min	133.42±4.58	133.48±9.50	0.9680
480 min	136.36±5.24	120.00±5.99	0.0001
540 min	137.80±5.40	121.56±5.82	0.0001
600 min	139.26±5.32	122.88±5.82	0.0001
660 min	128.24±10.99	124.94±4.92	0.0555
720 min	116.72±6.54	128.16±4.80	0.0001

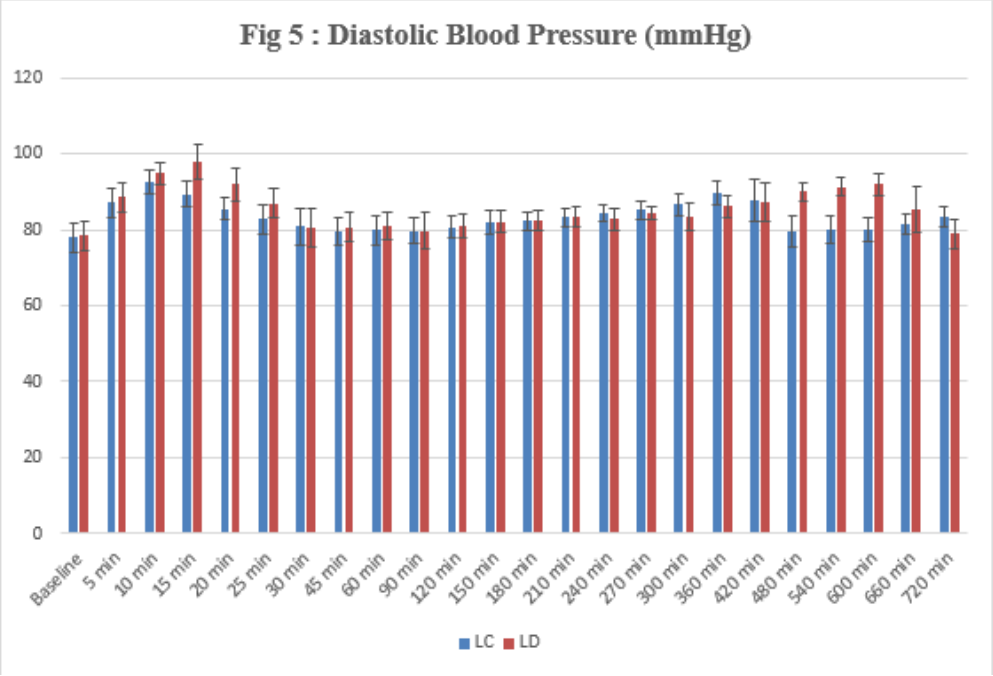


DIASTOLIC BLOOD PRESSURE

The mean diastolic blood pressure (mm Hg), the distribution of two groups was comparable. On comparing the diastolic blood pressure at baseline, 5, 10, 15, 20, 25, 30, 35, 40, 45, 60, 90, 120, 150, 180, 210, 240, 270, 300, 360, 420, 480, 540, 600, 660 and 720 minutes, it was found that the values obtained at 10, 15, 20, 25, 240, 270, 300, 360, 480, 540, 600, and 720 minutes had statistically significant. At 10 minutes, the mean diastolic blood pressure of LD-Group had mean of 94.88±2.80 while that of LC-Group was 92.36±3.17, (*P* =0.0001). And at 720 minutes, the mean heart rate of LD-Group had mean of 78.80±3.94 while that of LS-Group was 83.56±2.60, respectively (*P* = 0.0001). (Table 6 and figure 5)

Table 6: DBP (Mean+/-SD)

Time	LD GROUP	LC GROUP	p Value
Baseline	78.44±3.94	77.92±3.90	0.5087
5 min	88.48±3.82	87.00±3.84	0.0562
10 min	94.88±2.80	92.36±3.17	0.0001
15 min	98.04±4.56	89.32±3.47	0.0001
20 min	91.92±4.33	85.48±2.99	0.0001
25 min	86.94±3.73	82.68±3.65	0.0001
30 min	80.54±5.22	80.88±4.87	0.7370
45 min	80.72±3.79	79.48±3.76	0.1037
60 min	80.92±3.55	79.78±3.83	0.1259
90 min	79.76±4.81	79.72±3.40	0.9618
120 min	81.00±3.34	80.68±3.07	0.6191
150 min	82.08±2.80	81.72±3.13	0.5458
180 min	82.60±2.60	82.32±2.37	0.5749
210 min	83.48±2.67	83.20±2.29	0.5748
240 min	82.88±2.92	84.20±2.22	0.0125
270 min	84.24±1.79	85.12±2.29	0.0348
300 min	83.46±3.62	86.64±2.81	0.0001
360 min	86.08±2.94	89.60±3.08	0.0001
420 min	87.24±5.00	87.68±5.53	0.6774
480 min	89.92±2.59	79.68±4.09	0.0001
540 min	91.24±2.52	80.08±3.54	0.0001
600 min	91.96±2.93	80.24±3.12	0.0001
660 min	85.16±6.01	81.56±2.69	0.0002
720 min	78.80±3.94	83.56±2.60	0.0001



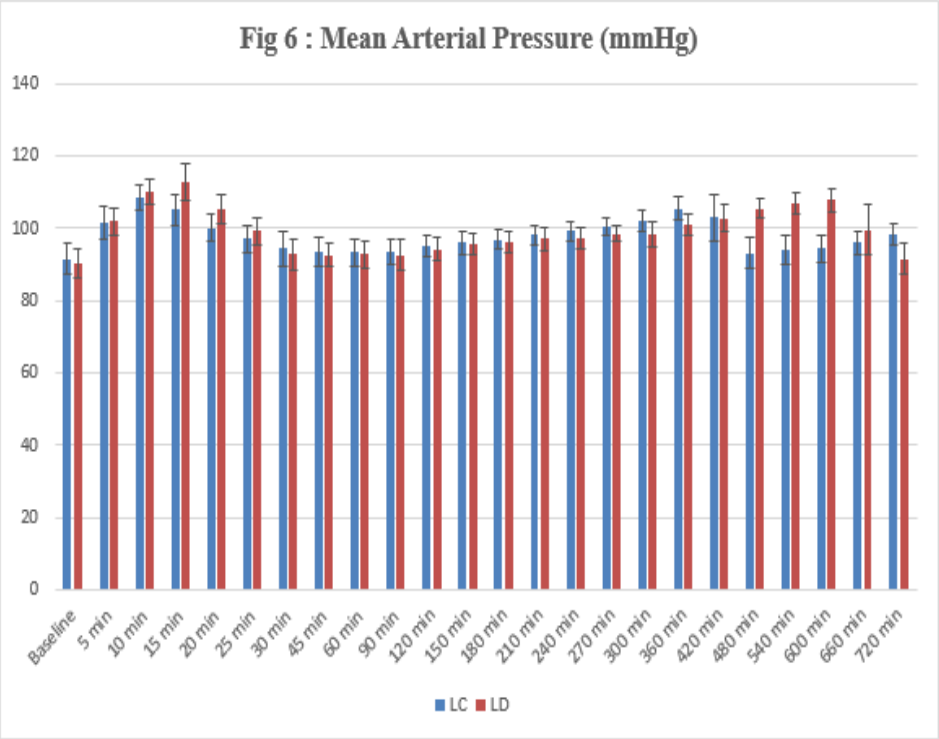
MEAN ARTERIAL BLOOD PRESSURE

The mean arterial blood pressure (mm Hg), the distribution of two groups was comparable. On comparing the mean arterial blood pressure at baseline, 5, 10, 15, 20, 25, 30, 35, 40, 45, 60, 90, 120, 150, 180, 210, 240, 270, 300, 360, 420, 480, 540, 600, 660 and 720 minutes, it was found that the values obtained at 10, 15, 25, 240, 270, 300, 480, 540, 600, and 720 minutes had statistically significant. At 10 minutes, the mean arterial blood pressure of LD-Group had mean of 110.19±3.52 while that of LC-Group was 108.33±3.48, (P =0.0092). And at 720 minutes, the mean heart rate of LD-

Group had mean of 91.44±4.19 while that of LS-Group was 98.43±3.05, respectively (P = 0.0001). (Table 7 and figure 6)

Table 7: MAP (Mean+/-SD)

Time	LD GROUP	LC GROUP	p Value
Baseline	90.05±4.02	91.43±4.25	0.0985
5 min	101.77±3.79	101.44±4.37	0.6875
10 min	110.19±3.52	108.33±3.48	0.0092
15 min	112.90±4.99	105.01±4.40	0.0001
20 min	105.21±4.23	100.08±3.79	0.4801
25 min	99.21±3.73	96.97±3.97	0.0045
30 min	92.69±4.18	94.25±4.68	0.0819
45 min	92.57±3.40	93.32±3.94	0.3107
60 min	92.68±3.66	93.24±3.88	0.4596
90 min	92.58±4.19	93.59±3.54	0.1960
120 min	94.10±3.28	94.95±3.10	0.1860
150 min	95.44±2.86	96.01±3.19	0.3491
180 min	96.13±2.89	96.83±2.76	0.2184
210 min	96.97±3.04	98.00±2.65	0.0787
240 min	97.21±2.72	99.11±2.53	0.0005
270 min	98.40±2.15	100.40±2.47	0.0613
300 min	98.28±3.28	102.05±3.06	0.0001
360 min	100.90±2.90	105.48±3.16	0.7652
420 min	102.63±3.82	102.95±6.52	0.7652
480 min	105.40±2.70	93.12±4.34	0.0001
540 min	106.76±3.03	93.91±3.98	0.0001
600 min	107.73±3.10	94.45±3.72	0.0001
660 min	99.52±6.89	96.02±3.20	0.0015
720 min	91.44±4.19	98.43±3.05	0.0001



ARTERIAL OXYGEN SATURATION

The distribution of two groups was comparable. On comparing the Arterial Oxygen Saturation at baseline, 5, 10, 15, 20, 25, 30, 35, 40, 45, 60, 90, 120, 150, 180, 210, 240, 270, 300, 360, 420, 480, 540, 600, 660 and 720 minutes, it was found that the values obtained at 10, 120, and 660 minutes had statistically significant. At 120 minutes, the mean arterial oxygen saturation of LD-Group had mean of 99.92±0.27 while that of LC-Group was 99.74±0.56, (P =0.0433). And at 660

minutes, the mean heart rate of LD-Group had mean of 99.94±0.24 while that of LS-Group was 99.96±0.28, respectively (*P* = 0.0001). [Table 8 and figure 7].

Table 8: SPO2 (Mean+/-SD)

Time	LD GROUP	LC GROUP	p Value
Baseline	99.98±0.14	99.94±0.31	0.4077
5 min	99.92±0.34	99.90±0.36	0.7758
10 min	100.00±0.00	99.80±0.45	0.0000
15 min	99.82±0.44	99.78±0.51	0.6755
20 min	99.98±0.14	99.92±0.27	0.1662
25 min	99.92±0.34	99.88±0.52	0.6499
30 min	99.88±0.39	99.86±0.40	0.8007
45 min	99.92±0.27	99.86±0.40	0.3815
60 min	99.90±0.42	99.86±0.45	0.6469
90 min	99.96±0.20	99.90±0.36	0.3055
120 min	99.92±0.27	99.74±0.56	0.0433
150 min	99.90±0.30	99.94±0.31	0.5136
180 min	99.94±0.31	99.94±0.24	1.0000
210 min	99.88±0.48	99.88±0.39	1.0000
240 min	99.90±0.36	99.94±0.24	0.5148
270 min	99.92±0.34	99.90±0.30	0.7558
300 min	99.96±0.20	99.88±0.39	0.1999
360 min	100.00±0.00	99.92±0.34	0.0000
420 min	99.96±0.00	99.70±0.61	0.0000
480 min	99.96±0.20	99.94±0.31	0.7023
540 min	99.96±0.20	99.88±0.39	0.1999
600 min	99.96±0.28	99.90±0.36	0.3545
660 min	99.94±0.24	99.96±0.28	0.0001
720 min	100.00±0.00	100.00±0.00	0.0000

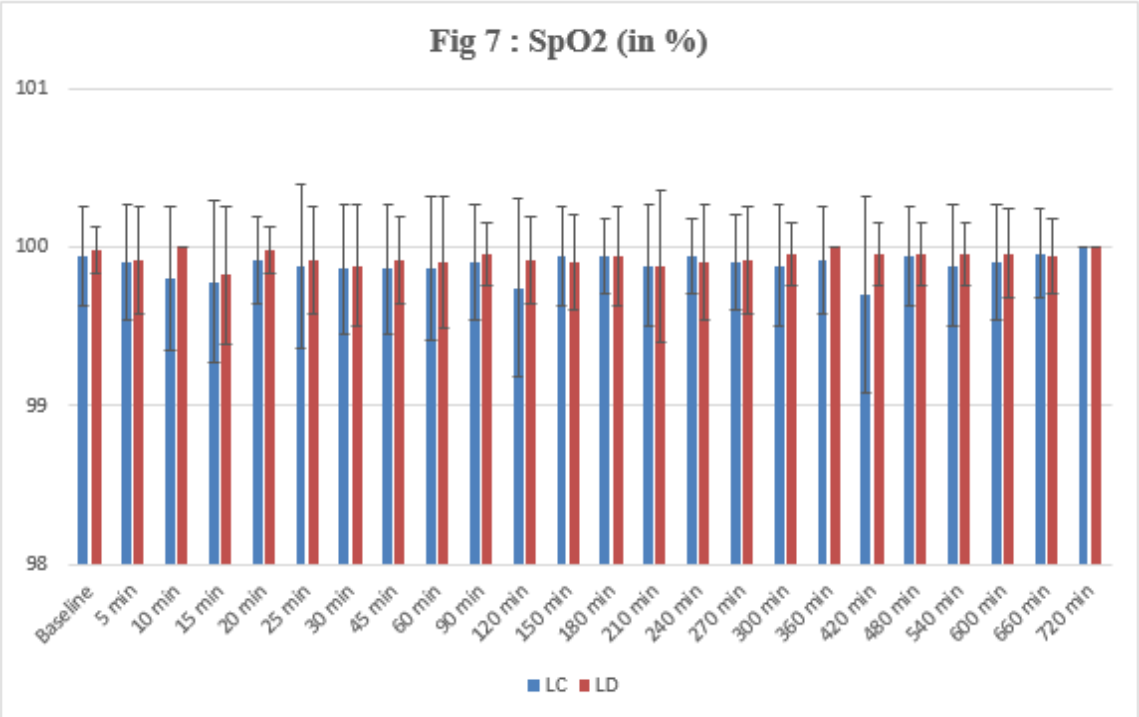


Table 9: Other complications and side effects

Side effects	LD GROUP(n=50)	LC GROUP(n=50)
Bradycardia	**0**	**1**
Nausea	0	2
Vomiting	0	1

DISCUSSION

Transversus abdominis plane block is a relatively new regional anesthetic technique used to provide postoperative analgesia of the anterolateral abdominal wall. It has been proved to be an effective component of multimodal analgesic regimen for a wide variety of abdominal procedures. Many studies demonstrate the efficacy of TAP block by highlighting some combination of drugs resulting in reduced pain scores and postoperative opioid requirements.[3,4,5,6] The technique for performing the TAP block has evolved from a landmark technique to an ultrasound guided technique.
Previous dose/concentration ranging studies have determined that concentrations of levobupivacaine in the range of 0.25% to 0.75% is optimal for TAP block when combined with adjuvants. Maximum dose of levobupivacaine (100mg) which we used is the safest dose of levobupivacaine according to Ishida et al.[5]

To prolong the effects of local drug we add adjuvants in different concentrations approved for peripheral blocks. Various adjuvants have been studied in TAP block like α_2 agonists, dexamethasone, magnesium sulphate and epinephrine.[7] Out of these α_2 agonists are the most commonly used adjuvants and the analgesic effect of α_2 agonists is well known.

The analgesic effects of spinal and systemic corticosteroids in combination with local anesthetics have been approved in human studies.[8,9] Addition of methyl prednisolone to local anesthetic has increased the duration of axillary brachial plexus block,[10] whereas dexamethasone microspheres have increased the block duration in both human and animal studies.[11,12,13] Furthermore, dexamethasone has been shown to possess anti-inflamatory action.[14]
These combinations of drugs prolong the analgesic effect and minimizes other side effects of local anesthetics as found by Gupta B et al. [14]

The present study was done to compare the effects of dexamethasone and clonidine as adjuvants to levobupivacaine in ultrasound guided TAP block in patients scheduled for total abdominal hysterectomy under general anaesthesia.

In the present study, there were no significant differences in the demographic characteristics of the patients between the two groups. The demographic profile of patients in the both groups were similar with regard to age, sex, weight (kg) height (cm), BMI and ASA grade.

In group LD, the duration of analgesia was 626.40±40.93minutes and in group LC the duration of analgesia was 403.40±31.63minutes. (p-value<0.0001). In group LD the time to first rescue analgesia was 626.40±40.93mins and in group LC the time to first rescue analgesia was 403.40±31.63mins. (p-value <0.0001).

In our study, we found that duration of analgesia (minutes) and time to first rescue analgesia (minutes) was significantly prolonged (p-value<0.0001) in dexamethasone (LD) group.

A. Akkaya et al.[15] conducted a study to determine the effect of dexamethasone with levobupivacaine on the block duration used for TAP block applied to patients who underwent caesarean section. The duration for post-operative analgesia was more in dexamethasone group in the study by Akkaya et al. as compared to our study. It can be attributed to the fact that they used 30 ml 0.25% levobupivacaine bilaterally for TAP block in contrast to 20 ml 0.25% levobupivacaine in our study. Also, there was a difference in the anaesthesia technique for surgery performed. They have used regional anaesthesia technique while we used general anaesthesia in our cases.

Mitesh D. Falia et al. [16] compared 0.25% bupivacaine with dexamethasone and 0.25% bupivacaine with clonidine for transversus abdominis plane (TAP) block as post-operative analgesia in patients undergoing lower segment caesarean section. The postoperative pain was evaluated by visual analogue scale (VAS) for pain scoring at every 2 hours for 12 hours postoperatively.
The duration for post-operative analgesia was more in our study in both the groups. It can be attributed to the fact that we used levobupivacaine in our study as it has higher safety profile and less toxic than bupivacaine. They used dexamethasone in a dose of 4 mg whereas we used 8 mg dexamethasone. The patients underwent LSCS under spinal anaesthesia with 0.5% bupivacaine (heavy) in this study, in contrast to participants in our study who were posted for elective TAH under general anaesthesia.

Gupta B et al.[13] randomly assigned ninety ASA I and II patients scheduled for TAH in a double blinded study and divided into three groups. Group L received 18ml of 0.25% levobupivacaine+2ml of NS to make total volume of 20ml on each side. Group LC and Group LD received 18ml of 0.25% levobupivacaine + 1 mcg/kg of clonidine or dexmedetomidine diluted in NS to make total volume of 20ml on each side. USG guided TAP block was given when subarachnoid block

level regressed to T10 level. The duration of analgesia in their clonidine group (LC) was 268.00±35.47mins which was comparatively lower than clonidine group in our study. In our study, the duration of post operative analgesia in our clonidine group was more as compared to their study which may be due to the fact that patients in their study underwent LSCS under regional anaesthesia in contrast to our study in which participants had TAH under general anaesthesia.

Comparison of postoperative NPRS scores between two groups

The baseline NPRS was comparable between the two groups. Lowest mean NPRS scores were found in group LD at 1 hr and 12 hrs and in LC group at 1 hr and 8 hrs. This may be explained by administration of rescue analgesic in the form of injection diclofenac just before these low pain scores except at 1 hr where low pain can be explained by TAP block. (Table 2, Figure 1)

Comparison of postoperative HR between two groups

The baseline HR was comparable between the two groups. Statistically significant lower HR was seen in clonidine group as compared to dexamethasone group initially. The decrease in HR with clonidine is because of postsynaptic activation of central α_2 receptors. This difference was also observed in a study by Gupta B et al [14]

There was significant difference in mean HR at 240, 270, 300 and 360 mins between the two groups which may be due to wearing off of the block effect ,in correlation with increasing NPRS at these intervals and hence requirement of rescue analgesia in LC group.

Similarly, Mean HR in LD group was significantly higher at 480, 540, 600 and 660 minutes as compared to LC group due to wearing off of the block effect and hence, requirement of rescue analgesia in LD group.

Comparison of postoperative SBP, DBP and MAP between two groups

Similar to HR, in our study SBP, DBP and MAP were comparable at the baseline in both the groups. Initially the LC group had significant difference and less SBP and DBP was observed than LD group which is due to postsynaptic activation of central α_2 receptors as stated earlier. After 2 hours, SBP, DBP and MAP had significant differences but that was not clinically significant and was due to wearing off of the effect of block. (Table 5, 6, 7 and Figure 4,5,6)

Comparison of side effects between two groups

In our study, we observed nausea in 2 cases and 1 case each of vomiting and bradycardia in LC Group. It was not statistically significant when compared to the other group. (Table 9)

No other major complication such as arterial puncture or peritoneal perforation was noted in both the groups.

CONCLUSION

The following conclusions were drawn from the study:

1. The NPRS scores were significantly lower in dexamethasone group as compared to clonidine group at specific time intervals.
2. The demand for the first rescue analgesia was delayed in dexamethasone group as compared to clonidine group.
3. Total duration of analgesia was more with dexamethasone group as compared to clondine group.
4. Incidence of side effects was more with clonidine as compared to dexamethasone group but was not statistically significant.

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