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ORIGINAL ARTICLE

Ultrasound Guided Transversus Abdominis Plane Block Versus Single dose Epidural Morphine as A postoperative Analgesia after Elective Cesarean Section

Neveen Mahmoud Alaasar, Kamelia Ahmad Gamal El Din Abaza, Mahmoud Abdelbasit Abdelaal *, Manal Salah El Din Farmawy

Department of Anesthesiology, Intensive care and Pain management, Faculty of Medicine, Zagazig University, Zagazig, Egypt

Corresponding author*:
Mahmoud Abdelbasit Abdelaal
E-mail:
Mahmoudrokn2000@gmail.com

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ABSTRACT

Background: Postoperative pain management following cesarean delivery under spinal anesthesia requires a number of procedures, systemic and/or intrathecal opioids, such as bilateral erector spinae plane (ESP) block and the transversus abdominis plane (TAP) block with parenteral analgesics. This study aimed to compare between ultrasound guided transversus abdominal plane (TAP) block and single dose epidural morphine on post-operative pain and analgesic requirement in parturients undergoing elective cesarean delivery.

Methods: This prospective randomized clinical study was conducted over the period of one year. This study comprised 64 patients who were induced spinal anesthesia and randomly assigned to two equal groups : group T (32 cases who received TAP block after skin closure) and group E (the remaining 32 cases who underwent epidural analgesia with a single dose of 4 mg morphine given in epidural space). all cases were submitted to a detailed history, physical examination, and regular laboratory investigation.

Results: Although the two groups expressed comparable scores during the first 3 hours after operation, but the TAP group reported reduced pain scores in later measurements. The timing of first analgesic request increased significantly in the TAP group. The required extra morphine dose increased significantly in the epidural group. The epidural group experienced much more nausea, vomiting, pruritis, and shivering.

Conclusions: In TAP block group, the lower postoperative numeric rating scores (NRS) measured in all time points, the lower amount of intravenous analgesics given to the patients in the postoperative period and high level of patient satisfaction of TAP block thechnique.

Keywords: Postoperative analgesia; Transversus abdominis plan; Epidural Analgesia **.**

INTRODUCTION

During the first 48 hours following surgery, women having cesarean sections via transverse lower abdominal incisions like Pfannestiel, Cherny, and Maylard incisions frequently experience excruciating discomfort [1]. Field block analgesia is useful for a range of abdominal surgical procedures since the abdominal wall is a significant cause of immediate post-operative pain following abdominal surgery[2].

For postoperative analgesia following a cesarean delivery, regional anesthetic techniques are employed with the aid of ultrasonography guidance [3].Examples are the quadratus lumborumb (QLB), ilioinguinal and iliohypogastric (II–IH) blocks, and the transversus abdominis plane (TAP) block[4,5].

Rafi originally described the transversus abdominis plane (TAP) block, a peripheral abdominal wall block, in 2001. The thoraco-lumber nerves are positioned between the internal oblique and the transverse abdominis muscle, and this block, currently called the posterior TAP block, requires injecting local anesthetics between these two muscles. Blockade has been demonstrated to consistently provide analgesia in the T10-L1 abdominal dermatome distributions, and it is frequently employed for analgesia following lower abdominal surgery[6].

Prior to the widespread use of standard ultrasound-guided regional anesthetic, the posterior TAP block was administered blindly by doctors[7].

An increased risk of visceral puncture or peritoneal damage may result from blind needle insertion. Right side TAP blockages may result in hepatic damage. The convenience and precision of injection are increased by ultrasound guided TAP blocks. Typically, a tiny bore blunt ended needle is utilized with a linear array ultrasound probe operating at a frequency of 5 to 15 MHz[8].

When it comes to pain management following surgery, neuraxial opioids outperform intravenous analgesia[9].

A single epidural morphine dose used for post-operative analgesia reduces post cesarean section pain from the first day to a substantial degree[10].Peak pain levels may postpone healing and correspond with breastfeeding and maternal mobilization. Continuous epidural catheter methods increase nurse workload and decrease patient mobility while prolonging analgesia[11].This study aimed to compare between ultrasound guided transverses abdominal plane block and single dose epidural morphine on post-operative pain and analgesic requirement in parturients undergoing elective cesarean delivery.

METHODS

The current study comprised 64 patients who were randomly assigned to two equal groups: group T (32 cases who received TAP block) and group E (the remaining 32 instances who underwent epidural analgesia). Following a thorough explanation of the details and drawbacks of each treatment, all included subjects provided informed written consent. The Institutional Review Board (IRB # 5847) has reviewed and the above-mentioned study was evaluated in terms of potential hazards and benefits using the Helsinki Declaration, the World Medical Association's ethical standard for human experimentation.

Inclusion criteria were; age between 18 and45years, patient acceptance, pregnant ladies scheduled for elective cesarean section, American society of anesthesiologists(ASA) class I or II. Body mass index (BMI $<$ 35 kg/m^2). Exclusion criteria were; emergency caesarean section, cesarean section with general anesthesia (placenta previa, unintentional hemorrhage), known allergy to any of the study medicines, additional surgery is planned for the same session, psychiatric problems or the use of psychiatric medications, as well as any contraindications to epidural or spinal anesthesia (local infection, coagulopathy, low fixed cardiac output).

Preoperative evaluation

All cases were visited the night before surgery. During these visits, all cases were subjected to detailed history taking with focusing on current medical comorbidities, general clinical examination, with revision of their laboratory parameters. The numeric rating scalepain screening instrument, was utilized to categorize the patients. It uses a 0–10 scale, where 0 represents "no pain" and 10 represents "the worst pain imaginable," to assess the patients' current level of pain[12].

Intraoperative management

Following the patients transfer to the operating room, routine monitoring was carried out, including noninvasive arterial blood pressure (NIBP), oxygen saturation (SpO2), and electrocardiograms (ECG). As an IV line, a broad diameter, 18 gauge cannula was placed. Spinal anesthesia was induced after a 15–20 minute preload crystalloid infusion (10 ml/Kg lactated ringer).

After sterilization and wrappig the back of the patient with sterile sheet in the sitting position, a skin wheal was raised by 26 gauge needle with 3 ml of 2% lidocaine. Spinal anesthesia was induced in both groups with 25G Quinke needle at L3-L4 inter-space.

Cases were injected with hyperbaric 12 mg of bupivacaine and fentanyl 10 mcg.

After spinal anesthesia, the patient was patient was changed to supine position, fluid infusion was initiated. The motor block was assessed using the modified Bromage scaleand an alcohol swab was employed to measure the sensory blockage [12].

The patient can move their ankles, knees, and hips; a modified Bromage scale (Bromage 0) was utilized to assess the motor block. When shecan move his knee and ankle but not her hips, that is known as Bromage 1. When she can only move his ankle and not her hips or knees, she is in Bromage 2. when she is unable to move his hips, knees, or ankles (Bromage 3)

During operation, pulse and MAPs were taken till the end of the procedure, every five minutes.

Following surgery, the patients' vital signs were documented, and a numerical rating scale for pain was used to gauge how bad the patients' pain was. Both the initial analgesic request time and the total amount of analgesics taken were noted. The degree of satisfaction in the two groups was documented together with the postoperative problems.

Tap block technique

Under ultrasound supervision, it was done on both sides while the patient was in the supine position. Sonoscape exp1 was used for ultrasound. Povidone iodine solution was used to disinfect the patients' lateral abdomen walls. On the unilateral abdominal wall, transversely, between the costal border and iliac crest, a 12MHz linear US probe in a sterile sheath was implanted. The practitioner stayed on the side of the area that was being operated on. The external, internal, and the lateral abdominal muscles' transversus abdominis wall were visualized by optimizing the position of the probe by shifting its angle or moving it in the anterior-posterior or cephalocaudal directions. Following the visualization of the three abdominal muscles, an 80 mm, 20-gauge B. Braun® Stimuplex needle (Melsungen, Germany) was inserted into the anterior end of the probe using an in-plane approach. Next, the needle was positioned between the transversus abdominis and the aponeuroses of the internal oblique muscles. Following the injection of 25 ml of local anesthetic (10 ml of 0.5% bupivacaine, 5 ml of 2% lidocaine, and 10 ml of normal saline), with intermittent aspiration, a hypoechoic shadow pushing two layers apart was seen. On the other side, the identical process was carried out again.

Epidural block technique

In a combined spinal epidural, the intrathecal injection and epidural implantation (using a two-needle approach) were carried out in either the same or a different interstice. The epidural was positioned at a higher inter-space if two inter-spaces were employed.Due to the potential for a delay in locating the epidural area following spinal injection, the epidural block catheter was put first. The Touhy needle (18) was gradually inserted until the epidural space was determined using the hanging drop or loss of resistance approach. Subsequently, the catheter was placed, and a 3 ml lidocaine 2% test dosage along with 1 /200,000 adrenaline was injected for the epidural test. Spinal block was done once the catheter's location was confirmed. A 4 mg dosage of morphine was administered via the epidural catheter following skin closure.

Postoperative assessment

Within the first twenty-four hours following surgery, heart rate and MAP were recorded every two hours. Following their transfer to the internal ward, the identical postoperative analgesia treatment was administered to each patient. Postoperative pain was measured using the numeric rating scale (NRS). The woman was asked to rate her pain on a 10-point scale, with 0 representing no discomfort and 10 being the severe suffering[13].After the operation, 1, 3, 6, 12, and 24 hours later, a numerical rating scale (NRS) was done IV paracetamol 1g was scheduled every 8 hours during ward follow-up, with the first dosage administered 8 hours later. Intravenous morphine was administrated if pain continuous after that, the total dose of morphine consumption was estimated in both groups.

A five-point Likert scale was employed to measure the degree of patient satisfaction; 1 represented "not satisfied at all." 2. "A little

content," Three are "much satisfied," four are "very satisfied," and five are "highly satisfied" [14].

Primary outcome: morphine usage within the first 24 hours after surgery.

Secondary outcomes: NRS occurs both during movement and at rest. There is a need for rescue analgesia. Nausea and vomiting are common. The occurrence of complications. Patient satisfaction.

Statistical Analysis

The SPSS (Statistical Package for Social Sciences) version 22 for Windows® (IBM SPSS Inc., Chicago, IL, USA) was used to code, process, and analyze the data. To ascertain whether the data were normally distributed, the Shapiro Walk test was employed. To visualize the qualitative data, relative percentages and frequencies were employed. To determine the difference between two or more sets of qualitative variables, use the Chi square test ($\chi 2$). Quantitative data was expressed as mean ± SD or standard deviation (SD). separate samples Two independent groups of regularly distributed variables (parametric data) were compared using the t-test. P value < 0.05 was considered significant.

RESULTS

Table 1; The average age of the included cases was 27.22 and 28.34 years in the TAB and epidural groups, respectively. In the same groups, the mean BMI was 27.92 and 29 kg/m2, respectively. In terms of obstetric history, the average gestational age in the two groups was 38.69 and 38.59 weeks, respectively. Gravidity had median values of 2 and 3, while parity had median values of 1 and 2, in the same groups. All preceding metrics revealed no significant difference between the two groups ($p > 0.05$).

The majority of the included ladies had a class I ASA, accounting for 84.4% and 81.2% of the participants in the TAP and epidural groups, respectively. The remaining instances were ASA class II. The mean duration of operation in the identical groups was 37.34 and 38.91 minutes, respectively. The level of sensory block reached T4 in 50% and 56% of the women in the same two groups, respectively, while the remaining individuals achieved T5. Table 2 shows that the preceding parameters did not differ significantly between the two groups.

Oxygen saturation revealed no significant difference between the two study groups at baseline, after spinal anesthesia, after delivery, or for 40 minutes intraoperatively as shown in table 3 .

Table 4 demonstrated that, baseline heart rates were statistically comparable between the two groups, the epidural group had considerably lower heart rates at 20, 30, 40 min and 6 hours postoperative following spinal anesthetic and surgery. Nonetheless, the differences were clinically negligible.

The baseline MAP was statistically comparable between the two research groups. Nonetheless, the epidural group had a statistically significant lower MAP 10, 20, 30 min and at 2hours postoperative than the TAB group. These changes were clinically insignificant, as seen in Table 5.

Although the two study groups reported comparable pain scores during the early 3 hours after operation, the TAP group exhibited reduced pain scores throughout subsequent assessments ($p < 0.001$) as shown in table 6.

Table 7 showed a significant increase in the time of initial analgesic request in the TAP group (315.97 vs. 251 minutes in the epidural group, $p < 0.001$). Similarly, morphine dose decreased significantly in the same group (1.5 vs. 4.81 mg in the epidural group, $p < 0.001$). In the epidural block group, all patients required rescue analgesia, compared to just 19 in the TAP group (59.4% - $p < 0.001$).

Complications were more common in the epidural group, with 71.9% of women experiencing nausea compared to 21.9% in the TAP group ($p < 0.001$). Vomiting was observed by 12.5% of epidural patients versus none in the TAP group ($p = 0.039$). Pruritis was observed by 15.6% and 53.1% of women, respectively, whereas shivering was recorded by 25% and 62.5% in the TAP and epidural groups, with a significant difference between them ($p = 0.002$) (table 8).

Table 9 shows that the TAP block group had considerably higher patient satisfaction ($p < 0.001$).

Table (1): Basic demographic and clinical data of the parturients in the study groups:

Variables	TAP Block(n=32)	Epiduralblock(n=32)	P-value
Age (years)	27.22 ± 3.70	28.34 ± 4.36	0.270 (NS)
Gestational age (weeks)	38.69 ± 0.93	38.59 ± 1.04	0.706 (NS)
BMI (Kg/m^2)	27.92 ± 2.78	29 ± 2.83	0.129 (NS)
Gravidity	2 (1 – 5)	3 (1 – 5)	0.733 (NS)
Parity	1 (0 – 3)	2 (0 – 4)	0.418 (NS)

n=Numberof casesin eachgroup Quantitative data are expressed as mean ± SD or Median (Range)NS:Non-significant (p> 0.05)

Table (2): Surgical data of the parturients in the study groups:

Variables	TAP Block (n=32)	Epidural block (n=32)	P-Value
ASA score			
ASA 1	27 (84.4%)	26 (81.2%)	0.740 (NS)
ASA 2	5 (15.6%)	6 (18.8%)	
Duration of surgery (min)	37.34 ± 6.95	38.91 ± 8.77	0.433 (NS)
Sensory level			
T4	16 (50%)	18 (56.2%)	0.616 (NS)
T5	16 (50%)	14 (43.8%)	

n= Number of cases in each group
Qualitative data are expressed as number (Percent)
Quantitative data are expressed as mean ± SD or Median (Range)
NS: Non-significant (p> 0.05)

Table (3): Oxygen saturation (%) of the parturients in the study groups: at different times:

Oxygen saturation (%)	*TAP Block (n=32)*	*Epidural block (n=32)*	*P-value*
Baseline	*96.72 ± 1.25*	*96.56 ± 1.52*	*0.655 (NS)*
After spinal anesthesia	*96.56 ± 1.32*	*96.84 ± 1.55*	*0.407 (NS)*
Immediately after delivery	*96.34 ± 1.29*	*96.53 ± 1.29*	*0.616 (NS)*
At 10 min intraoperative	*96.09 ± 1.69*	*96.09 ± 1.03*	*0.998 (NS)*
At 20 min intraoperative	*96.31 ± 1.12*	*96.03 ± 1.62*	*0.354 (NS)*
At 30 min intraoperative	*96.53 ± 1.24*	*96.44 ± 1.70*	*0.782 (NS)*
At 40 min intraoperative	*96.31 ± 1.18*	*96.25 ± 0.95*	*0.924 (NS)*

n= Number of cases in each group
Quantitative data are expressed as mean ± SD
NS: Non-significant (p> 0.05)

Table (4): Heart rate (beat/minute) of the parturient in the study groups at different times.

Heart rate (B/min)	*TAP Block (n=32)*	*Epidural block (n=32)*	*P-value*
Baseline	*93.26±11.42*	*94.35±11.03*	*0.407 (NS)*
After spinal anesthesia	*118.69 ± 11.376*	*119.18 ± 14.581*	*0.279 (NS)*
Immediately after delivery	*103.38 ± 14.593*	*105.96 ± 12.930*	*0.505 (NS)*
At 10 min intraoperative	*85.20 ± 14.564*	*76.48 ± 12.16*	***0.001 ** (HS)***
At 20 min intraoperative	*85.84 ± 13.093*	*80.69 ± 13.015*	***0.031 * (S)***
At 30 min intraoperative	*81.47 ± 12.191*	*77.40 ± 12.17*	***0.036 * (S)***
At 40 min intraoperative	*84.82 ± 12.525*	*78.47 ± 11.94*	***0.005 * (S)***
At 2-hours postoperative	*79.5 ± 11.64*	*76.98 ± 12.103*	*0.128 (NS)*

Heart rate (B/min)	*TAP Block (n=32)*	*Epidural block (n=32)*	*P-value*
At 4-hours postoperative	*81.16 ± 11.87*	*77.33 ± 11.58*	*0.068 (NS)*
At 6-hours postoperative	*82.34 ± 12.76*	*75.40 ± 11.94*	***0.011 * (S)***
At 12-hours postoperative	*79.28 ± 10.47*	*76.33 ± 11.48*	*0.165 (NS)*
At 24-hours postoperative	*78.01 ± 11.34*	*74.47 ± 10.75*	*0.059 (NS)*

n= Number of cases in each group
Quantitative data are expressed as mean ± SD
NS: Non-significant (p> 0.05)
*: Significant (p≤ 0.05) (S) **: Highly Significant (p≤ 0.001) (HS)

Table (5): Mean arterial Blood pressure (MAP) (mmHg) of the parturients in the study groups at different times:

MAP (mmHg)	*TAP Block (n=32)*	*Epidural block (n=32)*	*P-value*
Baseline	*88.89±9.92*	*86.44±16.59*	*0.543 (NS)*
After spinal anesthesia	*78.69 ± 11.376*	*76.18 ± 14.581*	*0.323 (NS)*
Immediately after delivery	*80.38 ± 14.593*	*79.96 ± 12.930*	*0.686 (NS)*
At 10 min intraoperative	*84.20 ± 13.52*	*77.98 ± 11.54*	***0.033 * (S)***
At 20 min intraoperative	*86.66 ± 13.34*	*80.71 ± 10.31*	***0.028 * (S)***
At 30 min intraoperative	*81.21 ± 12.93*	*76.40 ± 12.56*	***0.025 * (S)***
At 40 min intraoperative	*83.82 ± 13.24*	*79.09 ± 10.64*	*0.062 (NS)*
At 2-hours postoperative	*85.5 ± 11.64*	*79.98 ± 17.103*	***0.030 * (S)***
At 4-hours postoperative	*88.28 ± 13.093*	*87.33 ± 13.019*	*0.734 (NS)*
At 6-hours postoperative	*89.47 ± 12.191*	*88.40 ± 12.133*	*0.690 (NS)*
At 12-hours postoperative	*88.28 ± 13.093*	*87.33 ± 13.019*	*0.718 (NS)*
At 24-hours postoperative	*89.82 ± 12.525*	*90.47 ± 12.118*	*0.849 (NS)*

n= Number of cases in each group Quantitative data are expressed as mean ± SD
NS: Non-significant (p> 0.05) *: Significant (p≤ 0.05) (S)

Table (6): The numeric rating scale (NRS) of the parturients in the study groups at different times:

NRS	*TAP Block (n=32)*	*Epidural block (n=32)*	*P-value*
At 1 hour postoperative	*0 (0 – 1)*	*0 (0 – 1)*	*0.380 (NS)*
At 3-hours postoperative	*2 (1 – 3)*	*2 (1 – 3)*	*0.079 (NS)*
At 6-hours postoperative	*2 (1 – 3)*	*3 (2 – 3)*	***< 0.001 ** (HS)***
At 12-hours postoperative	*1 (1 – 3)*	*3 (2 – 3)*	***< 0.001 ** (HS)***
At 24-hours postoperative	*1 (1 – 2)*	*2 (2 – 3)*	***< 0.001 ** (HS)***

n= Number of cases in each group
Quantitative data are expressed as median (Range)
NS: Non-significant (p> 0.05) **: Highly Significant (p≤ 0.001) (HS)

Table (7): Postoperativerelated data of the parturients in the study groups:

Variables	**TAP Block (n=32)**	**Epidural block (n=32)**	**P-Value**
Time of first analgesic recall (min)	315.97 ± 17.20	251 ± 15.72	**< 0.001 ** (HS)**
Morphine dose (mg)	1.50 ± 1.44	4.81 ± 2.02	**< 0.001 ** (HS)**
Rescue analgesia			
No	13 (40.6%)	0 (0%)	**< 0.001 ** (HS)**
Yes	19 (59.4%)	32 (100%)	

n= Number of cases in each group
Quantitative data are expressed as mean ± SD
Qualitative data are expressed as number (Percent)
**: Highly Significant (p≤ 0.001) (HS)

Table (8): Complications in the study groups:

Variables	TAP Block (n=32)	Epidural block (n=32)	P Value
Nausea	7 (21.9%)	23 (71.9%)	**< 0.001 ** (HS)**
Vomiting	0 (0%)	4 (12.5%)	**0.039 * (S)**
Bradycardia	0 (0%)	0 (0%)	1 (NS)
Pruritis	5 (15.6%)	17 (53.1%)	**0.002 * (S)**
Shivering	8 (25%)	20 (62.5%)	**0.002 * (S)**

n= Number of cases in each group Qualitative data are expressed as number (Percent)
NS: Non-significant (p> 0.05) *: Significant (p≤ 0.05) (S) **: Highly Significant (p≤ 0.001) (HS)

Table (9): Parturients satisfaction in the study groups:

Variables	TAP Block (n=32)	Epidural block (n=32)	P-Value
Level of satisfaction			
Not satisfied at all	0 (0%)	7 (21.9%)	**< 0.001 ** (HS)**
Slightly satisfied	5 (15.6%)	19 (59.4%)	
Moderately satisfied	7 (21.9%)	6 (18.8%)	
Very satisfied	15 (46.9%)	0 (0%)	
Highly satisfied	5 (15.6%)	0 (0%)	

n= Number of cases in each group
Qualitative data are expressed as number (Percent)
**: Highly Significant (p≤ 0.001) (HS)

DISCUSSION

The current study included 64 women that were divided into two equal groups, each with 32 cases, at random;epidural group and TAP block group.we aimed to compare between ultrasound guided TAP block and a single dose epidural morphine on postoperative pain and analgesic requirement in parturient undergoing elective cesarean section.

In addition, the current study found no statistically significant difference in vital signs such as oxygen saturation, heart rate, and MAP between the two study groups. However, the epidural group had considerably lower heart rates and lower MAP at several time periods after spinal anesthetic and surgery, although these differences were clinically insignificant

Our results were consistent with those of Canakci et al., whose trial included eighty patients who had elective C-sections, were randomly assigned, and were split into two groups: the epidural block group and the TAP group. The patients belonged to the risk group ASA I–II. Based on the predetermined time points, they showed a significant difference in heart rate (HR) between the two groups. In contrast to the epidural group, where patients heart rates significantly decreased in the fifth minute, the TAP group's patients heart rates were more stable[15].

In the current study, the TAP group showed decreased pain scores throughout the following readings (p < 0.001), despite the two study groups expressing similar pain scores in the first three hours following surgery.This was in line with the findings of Ripoles et al. multicenter review research, which showed that TAP block lowers the VAS in the 24 hours following surgery [16].

On the other hand, Ben Marzouk and associates discovered that spinal morphine and TAP block had comparable analgesic efficacy

There have been several reports of combinations of intrathecal morphine and TAP block; these combinations have either used bupivacaine or ropivacaine. Worldwide

research has found that while spinal morphine plus TAP block may improve analgesia and perhaps delay the initial desire for analgesics, there is a rising incidence of negative effects associated with this combination [17].It is believed that spinal morphine reduces pain scores and increases morphine consumption, but not TAP block. It's possible that the combination of spinal morphine with TAP block won't produce any more analgesic benefit [18].

In the current study, the time of initial analgesic request indicated a substantial increase in the TAP group (315.97 vs. 251 minutes in the epidural group, $p < 0.001$). In the same group, morphine dosage also dramatically dropped (1.5 vs. 4.81 mg in the epidural group, $p < 0.001$).

This is consistent with Buluc et al.who divided thirty patients undergoing general anesthesia-induced cesarean sections into two groups. Group T patients (n = 15) received TAP Block with 0.25% bupivacaine in a total of 60 mL under USG supervision. Under USG supervision, patients in Group C (n=15) received a total of 60 ml of 0.9% NaCl (30 ml on each side). The TAP block recipients took longer to meet their initial analgesic demand, as the authors were able to demonstrate. The control group was more likely to utilize meperidine for post-operative analgesia[19] .

YokoOnoshi et al. compared TAP block with epidural anesthesia in 94 patients undergoing combination spinal-epidural anesthesia for cesarean sections; their results are comparable to the ones reported here. Near the conclusion of the procedure, 2 mg of epidural group morphine was injected into the epidural space. Following the surgery, the TAP group received 20 milliliters of either 0.375% ropivacaine or 0.3% levobupivacaine infused into both sides of the transversus abdominis plane. All patients were placed on a patient-controlled intravenous morphine analgesic regimen following surgery. In comparison to the control group, the TAP group showed a longer median time to the first morphine request (555 min vs 215 min) and a lower median cumulative morphine consumption over the course of a 24-hour period (5.3 mg vs 7.7 mg) [20].TAP block lowers the demand for analgesia in the post-operative 24-hour period, according to Ripoles et al. multicenter review research [21] .

In their multicenter evaluation comprising five studies and 312 patients, Abdallah et al.found that, TAP block is a useful analgesic option for post-operative analgesia following a cesarean section performed under spinal anesthesia in circumstances where spinal morphine is not administered[22].

Kanazi *et al.*showed that the intrathecal morphine group utilized larger doses (0.2 mg) of spinal morphine but showed lower overall tramadol dosages within the first 12 hours [23].

When compared to TAP block, intrathecal morphine provides benefits, but there are also significant drawbacks. Among these complications is post-operative nausea and vomiting (PONV). Thirty percent of patients receiving intrathecal morphine exhibit overt pruritus. But the most dangerous side effect of intrathecal morphine is respiratory depression [24].

In the current study, nausea was reported by 71.9% of women in the epidural group and by 21.9% of women in the TAP group. This suggests that the epidural group experienced issues far more frequently. 12.5% of patients in the epidural group reported vomiting, but there were no cases in the TAP group. In the TAP and epidural groups, pruritis was observed by 15.6% and 53.1% of women, respectively, whereas shivering was recorded by 25% and 62.5% of women, with a significant difference between them.

This was in line with Mishriky et al. findings from our study, which indicated that both groupsincidences of itching, nausea, and vomiting were similar. The most frequent side effects of spinal morphine, occurring in almost 30% of instances, are nausea and vomiting. TAP block analgesia reduces the incidence of nausea within the first 12 hours postoperatively, according to a meta-analysis involving nine studies. Nevertheless, none of these research addressed how analgesic procedures affected transit workers' recovery times [17].

According to the results of the study by Kanazi et al. comparing intrathecal morphine with TAP block in 57 patients, of the patients, 46% experienced PONV, and 39%

experienced excruciating itching that required pharmaceutical management. In their trial, Kanzai et al. utilized 0.2 mg of morphine; however, none of their patients experienced respiratory depression[23] .

Adjuvant opioids have been shown by Dahlgren et al. to decrease the incidence of postoperative nausea and vomiting, respectively. A number of factors, such as the degree of blockage and the reduced cerebral blood supply during the procedure that results in hypotension, can cause nausea and vomiting following a C-section. Depending on the degree of blockage in the latter case, stress on peritoneal tissues during the procedure may cause perioperative nausea and vomiting [25].

Additionally, the combination of the TAP block and spinal morphine delivery increased mother satisfaction [26]. The TAP block group in the current study had considerably higher levels of patient satisfaction ($p < 0.001$). In the TAP group, there were five cases (15.6%) with high satisfaction and fifteen cases (46.9%) with very satisfaction; in the epidural group, there were neither very nor extremely satisfied instances.

This was in line with a study by Onishi et al. that was comparable to ours. In this experiment, 94 pregnant women were divided into two groups prior to the elective C-section, and all of the patients in both groups received epidural anesthesia. After the C-section, the 54 ladies received a bilateral TAP block supervised by the US, as per their preferences. The remaining forty trial participants were administered intravenously 3 mg of morphine diluted with saline, as they declined to receive TAP blocking. According to the authors, both technique groups (the epidural analgesia group and the TAP block done) had very high levels of patient satisfaction, although the patients received remarkably little in the way of analgesics.

The authors of Kanazi's study discovered that TAP block and spinal morphine offered comparable levels of maternal satisfaction [23].The application of TAP block without ultrasound guidance, according to the authors, is the cause of this.

There are differences in the TAP block techniques for constipation and local anesthetic selection. But there isn't enough data to determine which focus or strategy is better than the other [27].In their investigation, McMorrow et al. discovered that spinal morphine enhanced analgesia following a cesarean section, but not TAP block. Spinal morphine plus bupivacaine TAP block did not produce any further analgesic effects [28].

Conversely, some research indicates that the addition of TAP Block to ıntratechal morphine results in superior analgesia. TAP block has been selected by Mirza et al. as the supporting analgesic technique for patients undergoing spinal anesthetic during cesarean sections (12 mg of buprevacaine, 10 µg of fentanyl, and 200µg of morphine). They discovered that in every case, TAP block offers further analgesia 10–19 hours after surgery. They believe that the prolonged provision of additional analgesia results from diffusion of the local anesthetic into the paravertebral space [29]

Notwithstanding the promising outcomes, the present investigation is subject to many limitations, given its single-center design and rather small sample size of patients. Additionally, the investigated medications were administered at a single dose with no adjustments.

Conclusions: It was concluded that in the TAP block group, the superiority of the TAP block approach in postoperative pain control was evidenced by the higher patient satisfaction levels, the lower postoperative NRS ratings recorded at all time points, and the smaller amount of analgesics given to patients throughout the postoperative period. The TAP block group has fewer side effects and greater hemodynamic stability than the other group.

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