EFFICACY OF ULTRASOUND GUIDED BILATERAL TRANSVERSUS ABDOMINIS PLANE BLOCK FOR THE ACUTE POST-OPERATIVEPAIN RELIEF IN THE OBSTETRICS & GYNECOLOGICAL SURGERIES IN FIRST 24 HOURS

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ABSTRACT

Objective: To compare the efficacy of ultrasound guided bilateral transversus abdominis plane block with conventional analgesic technique for post-operative pain relief, time to first request for analgesic, early mobilization, opioid related side effects in obstetric and gynecological surgeries.

Study Design: Quasi experimental study.

Place and Duration of Study: Obs & Gynae Department at Combined Military Hospital Lahore and Hyderabad, from, Apr 2017 to Sep 2017.

Methodology: In this study 200 mothers were included. The population under study was divided into two groups, group-A mothers had Transversus Abdominis Plane block and group B (control) without Transversus Abdominis Plane block.

Results: The mean age was 34 years within a range of 20 to 50 years. Pain score, Visual Analogue Score, was much lower in group A (with TAP block) in comparison to group B (without TAP block) (*p*-value=0.000). The median time for asking for painkillers was 10 hrs (9, 11) in group A as compared to 3 hrs (2, 6) in group B.

Conclusion: Transversus Abdominis Plane block reduced pain intensity, delays the requirement of painkillers and decreased any additional requirements of opiates-analgesics especially when those are used as a part of any painkilling-regimens after obstetric and gynecological surgeries.

Keywords: Anaesthesia, Analgesia, Cesarean section, Early ambulation, Lower segment, Morphine, Nerve block, Post-anaesthesia care.

INTRODUCTION

Effective pain management has a crucial role in post-operative period for women after caesarean delivery and other gynecological surgeries[1]. In Obstetrics practice especially among unbooked cases, Caesarean delivery has been one of the most frequently performed major surgical procedure causing severe post-operative pain[2]. Because of the increasing awareness, women want to be pain-free to care for themselves as well as for their newborn babies[3]. The pain and discomfort after the caesarean delivery is mainly due to abdominal wall incision and dissection of abdominal muscles and 79% of women experience pain at the incision site that can last for upto 2 months[4]. Resultantly it leads to delayed mobilization and post-operative complications such as thromboembolic phenomena[5]. Therefore, providing an effective and safe analgesic method is crucial to facilitate early mobilization of the mother and prevention of post-operative morbidity. Effective pain management in post-operative period not only increases patient's satisfaction but also decreases the duration of hospital stay along with the reduction in the risk of complications[6].

McDonnell and colleagues reported that Transversus abdominis plane (TAP) block can reduce the post-operative pain following abdominal surgeries. The landmarks of this block were first described in 2001 by Rafi. The TAP block has been performed in the patients undergoing caesarean delivery and hysterectomy under spinal anesthesia and laparoscopic surgery for post-operativeanalgesic pain[7-9].

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Among many techniques, TAP block is a novel technique in a way that it inhibits the neural-afferents when a local anesthesia compound is injected in-between the neurofascial plane i.e. Internal oblique muscle and transversus abdominis muscle. The TAP block has also been shown to reduce morphine consumption after caesarean delivery under spinal anaesthesia. Increasing TAP blocks have been performed under ultrasound guidance which may be more precise and safer than the blind approach. RCTs have proved the effectiveness of TAP block technique when given as a part of post-operative painkilling regimen following caesarean delivery and abdominal hysterectomy[9,10].

METHODOLOGY

This study was conducted at Obs & Gynae departments of CMH Lahore and Hyderabad. The study duration was 6 months from April 2017 to September 2017. Simple random sampling technique was used for data collection. After getting the approval of hospital ethical and research committee, informed consent of patients was obtained. Inclusion criteria were patients willing to be included in this study, undergoing Lower Segment Caesarean Section, abdominal hysterectomy orlaparotomy having age 25-50 years, weight 70-80 kg and BMI 24-30. Whereas exclusion criteria were patients with any history of drug addiction e.g opioids/benzodiazepines, coagulopathy or psychological disorders and sensitivity to any particular analgesic drugs.

A sample of 200 patients were divided equally into two groups of 100 each. Sample size was calculated by using WHO sample size calculator keeping the confidence level of 95%. Patients were allocated randomly using a computer-generated random number table to undergo TAP block (n=100) and standard care (control) with no block (n=100).

On arrival in the operating room, monitoring like pulse oximetry, continuous ECG and non-invasive blood pressure measurement was started prior to induction of anaesthesia. An 18-gauge intravenous catheter was inserted in the left hand.

TAP block was performed bilaterally at the end of the operation, when the patient was still under general anaesthesia. The well qualified anesthesiologists were usually employed for this technique who made best use of the ultrasonography to identify different muscles in the anterior abdominal wall, namely External Oblique, Internal Oblique and Transversus Abdominis. The injected area was first prepared by disinfectants, then a 22G insulated needle which is about 100mm in length is employed under ultrasonic guidance, whose position was confirmed by visualizing its tip in-between internal oblique and transversus abdominus, it was also aspirated to check for any vascular injury and then 20cc of bupivacaine 0.5 percent was injected in supplement of 5ml, the total quantity was kept less than 40 ml, just enough for infiltrating the both sides.

After the successful surgery, thepatients were shifted to post-anesthesia Care Unit (PACU) before shifting to the wards and a standard post-operativeanalgesic regime of intravenous 50mg of Tramadol for the alleviation of severe pain were given to the both groups in the initial 24 hours. After transferring from the PACU towards all the patients were assessed at upto 24 hrs after the procedure for 'pain''&' nausea and vomiting'. For pain scoring, patients were asked to rate their 'pain-severity' by employing Visual Analogue score as (0=absence of pain to 10=the worst pain), severity of nausea and vomiting by using 4-point score rating (0=none 1=mild, 2=moderate, 3=severe and 4=vomiting) and the 'need for antiemetics' and 'satisfaction-scores' of mothers with and without TAP block. Analgesics' consumption in the first 24 hours was also recorded. 24 hours later, Ibuprofen was given in the dose of 800 mg orally and Acetaminophen 1000 mg orally 8 hourly to each patient.

All the collected data was entered and analyzed in SPSS version 18. Descriptive statistics such as mean, frequency and standard deviation

will be calculated for all numerical variables such as age, weight, height, BMI and type of surgeries in two different groups. Independent sample t-test wasused to compare analgesic requirement in post-operative period at 2, 6 and 24 hours post-operatively. Similar test was used to compare the significance of nauseating feeling and maternal satisfaction in both groups.

Table-I: Distribution of patients.

Procedures	Group-A (Transversus Abdominis Plane block)	Group-B (Control)	Percentage
Lower segment caesarean section	62	62	62
Abdominal hysterectomy	23	23	23
Laparotomy	15	15	15

Table-II: Comparing means of VAS of both groups.

	Groups	N	Mean ± SD	Std. Error Mean	*p*-value
Pain score at 2 hours	With TAP Block	100	0.95 ± 0.821	0.082	0.000
	With No Block	100	4.09 ± 1.334	0.133	
Pain score at 6 hours	With TAP Block	100	1.52 ± 0.502	0.050	0.000
	With No Block	100	3.35 ± 1.777	0.178	
Pain score at 24 hours	With TAP Block	100	1.38 ± 1.117	0.112	0.000
	With No Block	100	2.92 ± 0.825	0.082	

RESULTS

A total of 200 patients were included according to the inclusion criteria of this study. The patients were randomly divided into two equal groups. Group-A had TAP block and group-B without TAP block (control) (table-I).

Age, weight, height & BMI of the patients were kept as independent variables. Group-A patients experienced an increase in the duration of time for the first painkiller (Injection tramadol) demand. The median (interquartile-range) time for demand of Tramadol for the first-time was 10 hrs (9,11) in group A (study group) as compared to 3 hrs (2,5) in group B (control group) without TAP block.

Pain scores were much lower with statistically significance in group-A (having TAP block) while comparing to group-B (without TAP block) at 2, 4 and 24 hours after the surgeries. (p<0.000, independent sample t-test) (table-II & figure).

Scores recorded for nauseating feeling were markedly lower in group-A especially after 14 hours of the procedures. The median (maternal-satisfaction scores) were markedly higher in group-A (having TAP block) while comparing to group-B (without TAP block).

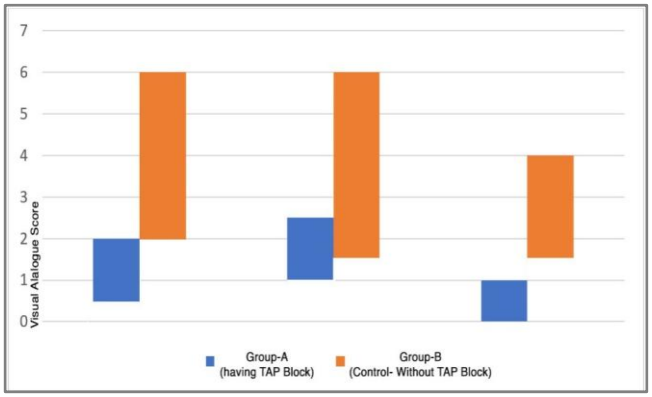

Figure: Post-operative pain and visual analog scores at rest and on movement.

Table-III: Side effects in both groups (n=100).

	Nausea		Vomiting		Sedation Requirement		Early Mobilization	
	Control	Transversus Abdominis Plane	Control	Transversus Abdominis Plane	Control	Transversus Abdominis Plane	Control	Transversus Abdominis Plane
Positive	11	02	16	05	42	10	23	71
Negative	89	98	84	95	58	90	77	29

A total of 11 patients had feeling of nausea in the post-operative period in the control group,

while in bilateral TAP-block-receiver group there were only 2 patients. Nonetheless, it was not associated with any significant difference in the incidence of nauseating feeling or distribution of nausea-scores in-between two groups in 24-hours of observation. Moreover, the TAP-block markedly lessened the incidence of sedation, from 30 - 40% in the control-group reaching upto 10% in the TAP-block group. Early mobilization was seen in the patients who received bilateral TAP block as compared to the control group (table-III).

DISCUSSION

Post-operative pain control after Gynecological & Obstetric surgeries especially caesarean section is a big challenge for obstetrician as it should address both for mother's comfort with equally no harmful-effects to the neonate. The neuraxial opioids provide excellent analgesia but those are associated with various adverse effects like feeling of nausea, vomiting and pruritis which can decrease patients' satisfaction. Our study demonstrated that ultrasound-guided TAP blocks decreased 24 hours post-operative pain-intensity as well as analgesic requirement, as group-A (TAP block) required few doses of Injection Tramadol after 24 hours as compared to group-B (without TAP block). Two different studies showed that there was no significant difference in-between pain intensity or demand of analgesia in the post-operative period when TAP block was used in caesarean section under spinal anesthesia[17,18]. One more research published on caesarean section performed under the spinal anaesthesia with TAP block lessened the demand of post-operative analgesia[19,20].

The first analgesic request for pain control was longer in mothers who received TAP block. In group-A the first request was at 10 hours as compared to the group-B which was at 3 hours. The maximum pain-intensity was at the 6th hours following surgery and it decreased after this time. The VAS scores in each measured time was less in group A than in group B. The pain scores at rest, 24-hours following the discharge from ward were the same in the both groups.

The pain and discomfort after caesarean section delays early mobilization in post-operative-period. In our study early mobilization was seen in 70.86% and delayed mobilization in 29.14% In our study TAP block caused less pain-intensity during movements like coughing in 24 hours after caesarean section meaning by TAP block successfully reduced the somatic pain in our study.

In our study nausea and vomiting was seen in 2 and 5 patients respectively in group-A with TAP block as compared to 11 and 16 patients in group-B without TAP block respectively. The satisfaction level was higher in patients with TAP block as compared to patients without TAP block.

CONCLUSION

TAP block reduces pain intensity, prolongs the time to first analgesic request and decrease supplemental opioids requirment when used as a component of multimodel regimen for pain relief after caesarean section.

CONFLICT OF INTEREST

This study has no conflict of interest to be declared by any author.

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