A comparison Between the Transversus Abdominis Plane (TAP) Block Versus Traditional Parentral Analgesia Post Caesarian Section

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ABSTRACT:

BACKGROUND:

Postoperative pain, especially when poorly controlled, results in harmful acute effects (i.e., adverse physiologic responses) and chronic effects (i.e., delayed long-term recovery and chronic pain).
The transversus abdominis plane (TAP) block is a new method of providing postoperative analgesia in patients undergoing lower abdominal wall incisions

OBJECTIVE:

To compare the effectiveness of TAP block versus traditional parenteral analgesia post caesarian section.

PATIENTS AND METHODS:

A prospective randomized double blinded placebo controlled clinical trial conducted in the department of obstetrics & gynecology of medical city complex. over a period of four months from 1st of November to 1st of march. Fifty women patients were selected to be enrolled in this study who were scheduled for C.S. via pfannenstiel incision, all patients were of ASA I- II physical status. Twenty five of them were given TAP block with (bupivacaine 0.25%) & placebo i.v saline (0.9%) , the other twenty five were given i.v tramadol & i.m diclofinac sodium & placebo TAP block with normal saline 0.9%.Numerical rating scale was used to follow up the patients postoperatively at 2,6,12,16 hours.

RESULTS :

By comparing the means of numerical analogue scale score over the time there was a significant difference in mean score over the time, the traditional treatment had better effect on relieving pain only at the 1st 2 hours where TAP block was better on the rest time with a highly significant difference P.value < 0.05 in all comparisons.

CONCLUSION:

TAP block is not effective as sole analgesic, but is effective in reducing the frequency of doses of incremental analgesia. TAP block is more effective than traditional analgesia in reducing the mean of pain score .The traditional parentral analgesia require more frequent dosing.

KEY WORDS: TAP, parentral analgesia, tramadol , diclofinac sodium , bupivacaine

INTRODUCTION:

Uncontrolled postoperative pain may produce a range of detrimental acute and chronic effects. perioperative analgesia may decrease complications and facilitate recovery during the immediate postoperative period and after discharge from the hospital.(1)

Attenuation of postoperative pain, especially with certain types of analgesic regimens, may decrease perioperative morbidity and mortality.(2)

The analgesic regimen needs to meet the goals of providing safe, effective analgesia, with minimal side effects for the mother and her child.(3)

Cesarean delivery is a major surgical procedure after which substantial postoperative discomfort a pain can be anticipated. The provision of effective postoperative analgesia is of key importance to facilitate early ambulation, infant care, (including breast feeding،maternal-infant

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bonding) and prevention of postoperative morbidity.[4]

Opioid analgesics are one of the cornerstone options for the treatment of postoperative pain. These agents generally exert their analgesic effects through μ-receptors in the CNS, although there is evidence that opioids may also act at peripheral opioid receptors.[5]

There is wide intersubject and intrasubject variability in the relationship of opioid dose, serum concentration, and analgesic response in the treatment of postoperative pain.[6]

Tramadol is effective in treating moderate postoperative pain[7] and comparable in analgesic efficacy to aspirin (650 mg) with codeine (60 mg) or ibuprofen (400 mg)[8]. Advantages of tramadol for postoperative analgesia include a relative lack of respiratory depression, major organ toxicity, and depression of gastrointestinal motility and a low potential for abuse.[9]

NSAIDs are also traditionally considered a useful adjunct to opioids for the treatment of moderate to severe pain, although some quantitative, systematic reviews suggest that NSAIDs, alone or in combination with opioids , may be more beneficial than previously thought[10]

A revolution in the management of acute postoperative pain has occurred during the past 3 decades.[11]

The Transversus Abdominis Plane (TAP) Block is a local anaesthetic block used to provide analgesia to the anterior and lateral abdominal wall.[12]

The description of a landmark technique for performing a TAP block advocated a single entry point, the triangle of Petit, to access a number of abdominal wall nerves hence providing multi--dermatome analgesia [12]. More recently, ultrasound guided TAP block has been described with promises of better localization and deposition of the local anaesthetic with improved accuracy [13]

Initial studies were able to demonstrate blocks extending from T7-L1 using bilateral injections. Subsequent studies have been unable to reproduce these findings with most studies achieving uppermost sensory levels around T9/10.

It therefore sensible to recommend that the TAP block can only reliably be used for analgesia in surgery on the lower abdomen [14,15]

As far as I know it is the 1st clinical study regarding TAP block in Iraq and it has been done via landmark technique as the ultrasound guided not available at the time

PATIENTS AND METHODS:

This is a prospective randomized double blind placebo controlled clinical trial conducted at Baghdad teaching hospital / medical city complex / Baghdad/Iraq, during the period from 1st of November to 1st of march. Fifty patients were selected to be enrolled in this study who were scheduled for C.S. via pfannenstiel incision . All patients were of ASA I&II physical status , & randomly selected .

Patients who had a history of relevant drug allergy were excluded. Patients' consent were taken, demographic data including age, and weight were recorded in already prepared data collecting sheet. All patients were undergone general anaesthesia with rapid sequence induction, they received uniform induction with (thiopenton 3-5 mg/kg, ketamin 0.5 mg/kg, suxamethonium1mg/kg), endotrachial intubation have been done , the maintenance were (isoflourane 1%, atracurium 0.15mg/kg, and fentanyl 1mcg/k was given after baby delivery)

Patients were randomly allocated into 2 groups (25 patients each) as in table (1):

(TAB group) were undergone TAP block with 1,5mg/kg bupivacaine 0.25% bilaterally to a maximum dose of 50mg per side using(a 22-gauge 100-mm blunted spinal needle) with parenteral placebo (normal saline 0.9% by 2 syringe 1 of 2 ml regarded as tramadol 100mg i.v and the other was of 3 ml regarding as diclofenac sodium 75 mg i.m)

.(parenteral group)were undergone TAP block with saline 0.9% and parenteral analgesia (tramadol 1mg/kg i.v. up to 100mg and diclofenac sodium 1mg/kg up to 75mg i.m). TAP block was performed & parenteral analgesia was given at the end of surgery . All patients were scheduled for postoperative monitoring using a numerical rating scale (NRS) from(0-10) at specific times (2nd,6th,12th,16th) hr. postoperatively and the readings were recorded in data collecting sheet. NRS evaluation regarded as following (0: no pain,1-4: mild pain, 5-7: moderate pain , 8-10: sever pain) and reading more than 4 used as cut

point at which additional analgesia (pethidine 50mg i.m incrementally) was given.

Level of significance in all statistical tests and comparisons was set at P.value ≤ 0.05 to be considered as significant difference

Table 1: Patients groups.

patients	TAB block	Parenteral analgesia
TAP group	TAP block 2 syringe of 20 ml bupivacaine 0.25% & the dose was 1.5mg/kg not more than 100 mg total	2 syringe , one with 2 ml normal saline0.9% regarded as 100mg tramadol the other with 3ml normal saline 0.9% regarded as 75mg diclofinac sodium.
Parentral group	TAP block 2 syringe of 20ml contained normal saline 0.9% considered as placebo given in the same manner of bupivacaine	2 syringe: one with 2 ml tramadol 100mg , the other with 3 ml diclofinac sodium 75mg .

RESULTS:

As it had been shown by table (2) & figure(7) There was no significant differences in ASA, Parity, Age or weight in between groups, P.value >0.05 in all comparison.

Table 2: Preoperative patient's characteristics.

Characteristic		Tap block	Traditional RX	P.value
Number (patient)		25	25	-
ASA (patient) I \ II		18\7	15\10	0.55
Parity	Mean ± SD *	2.7 ± 1.1	2.68 ± 1.3	0.95
	Range	1 - 5	1 - 6	-
Age (year)	Mean ± SD	26.3 ± 6.7	28.16 ± 7.2	0.34
	Range	16 - 41	18 – 37	-
Weight kg	Mean ± SD	70.5 ± 13.6	72.96 ± 9.7	0.45
	Range	39 - 91	52 - 86	-

SD= standard deviation

From other point of view, by comparing the means of numerical rating scale over the time there was a significant difference in mean score over the time the traditional treatment had better effect on the relieving pain only at the 1st 2 hours where as TAP block was better on the rest of time with a highly significant difference , P.value < 0.05 in all comparisons, Table (3) &figure(1).

Table 3: A comparison of mean numerical rating scale over the time.

Time of dose needed	Tap block	Traditional RX	P.value
2 hr	5.7 ± 2.5	3.4 ± 2.8	0.004
6 hr	3.2 ± 2.1	5.24 ± 2.8	0.005
12 hr	2.7 ± 2.4	5.16 ± 2.8	0.002
16 hr	2.4 ± 2.3	3.88 ± 2.7	0.042

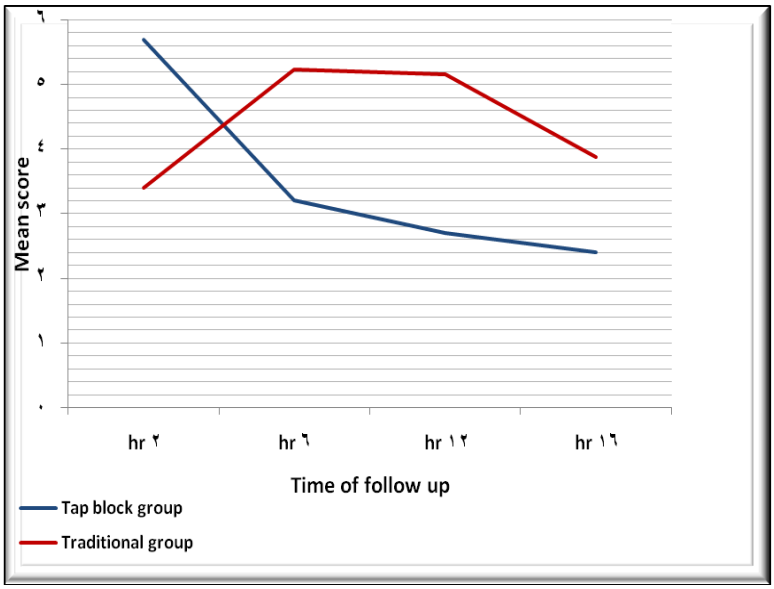

Figure 1: Comparison of mean numerical rating scale in between patient's groups.

It has been found that at the first 2 hours 17 out of 25 patient in TAP group needed additional doses versus only five patients of parentral group P=0.002, but with time the number of patients who needed additional doses decreased significantly in TAP group while increased significantly in Parentral group, in all comparisons P.value < 0.05. Table (4) & figure(2).

Table 4: No. of patients who were needed additional doses in both groups.

Time of dose needed	Tap block	Traditional RX	P.value
2 hr	17	5	0.002
6 hr	7	13	0.014
12 hr	6	15	0.02
16 hr	6	13	0.008

On the other hand, there was no significant difference in frequency of doses needed per patients in both groups, P.value >0.05 in all comparisons, Table(5) .

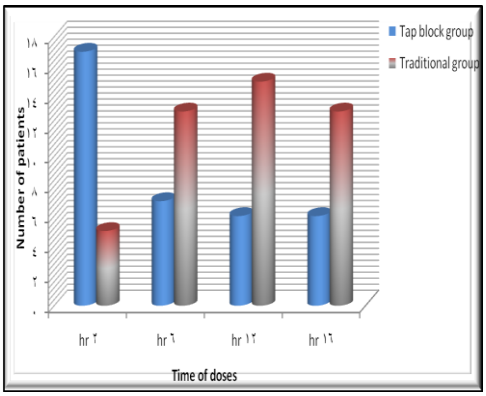

Figure 2: Comparison in between patient's groups who were needed additional doses.

Table 5: Frequency of doses requirement for each patients compared in between both groups.

frequency	TAP block	Traditional RX	P.value
0	3	1	0.6
1	13	8	0.25
2	5	12	0.07
3	3	3	0.66
4	1	1	0.47
Total	25	25	

DISCUSSION :

This study compares the effectiveness of TAP block versus traditional parenteral analgesia post C.S. and the results obtained declared that by comparing the means of numerical rating scale over the time there was a significant difference in mean score, the parentral treatment had better effect on pain reliving only at the 1st 2 hours where as TAP block was better on the rest of time with a highly significant difference , also it had been found that at the first (2) hours (17) out of (25) patient in TAP group needed additional doses versus only (5) patients of traditional group ,so we may have two possibilities either TAP block require time to start working or it is not effective alone.

The findings that with time the number of patients who were needed additional doses decreased significantly in TAP group after the addition of pethidine &there pain score was reduced ,this may be due to the synergism between the two modalities that was investigated by many researches as below.

A study done by McDonnell team 2008 who examined TAP block efficacy after caesarean section delivery. Fifty elective patients for caesarean section (Via spinal anaesthetic and Pfannenstiel incision) were randomized to receive TAP block (landmark method) versus placebo in addition to standard analgesia (paracetamol, diclofenac sodium and intravenous morphine). The TAP block was performed at the end of surgery using 1.5mg/kg ropivacaine (to a maximal dose of 150mg).

A blinded investigator assessed patient at specific time intervals between 2 to 48 hours postoperatively.

Results showed TAP block reduced visual analogue pain score and mean total morphine requirements in the first 48 hours(18mg versus 66mg in the placebo group) [15]

Also a meta-analysis on the clinical effectiveness of TAP block has been done by Sddiqui MR and his colleges in UK in 2011 showed TAP block reduces the need for

postoperative opioid use, it increases the time of first request for further analgesia, it provides more effective pain relief , and it reduces opioid-associated side effects [16].

On the other hand, there was no significant statistical difference in frequency of incremental doses needed per each patient in both groups but actually more incremental doses was used in parentral group

CONCLUSION:

1.TAP block is not enough as sole analgesic agent.

2. TAP block is effective in reducing the frequency of incremental doses of analgesia.

3.TAP block is more effective than traditional analgesia in reducing the mean of pain score when the incremental doses are included .

4. More frequent doses are required when only parentral analgesics are used

Recommendations :

1.TAP block can be used as part from multi modal analgesia post C.S . but not as a sole analgesia because it decreases the frequency of incremental parenteral analgesia.

2.It is recommended to perform another thesis to study the synergistic effect of TAP block and parentral analgesia.

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