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Original Research Article

To compare the analgesic efficacy of TAP block versus traditional parenteral analgesia in lower abdominal surgeries

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Abstract

Background & Methods: The aim of the study is to compare the analgesic efficacy of TAP block versus traditional parenteral analgesia in lower abdominal surgeries. Landmark technique was used in this study. This technique depends on feeling double pops as the needle traverse the external oblique and internal oblique muscle. A blunt needle was make loss of resistance more appreciable.

Results: The age, weight, height, BMI and duration of surgery is comparable in both the groups, with no significant difference found ($p>0.05$).Mean PR, SBP, DBP, MBP, SPO2, RR between the two groups does not shows significant difference from each other ($p>0.05$) they are comparable.

Conclusion: All patients were scheduled for postoperative monitoring using a visual analogue scale (VAS) from (0-10) at specific times (4nd, 8th, 12th, 16th 20th 24th) hr postoperatively and the readings were recorded in data collecting sheet. VAS 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 a cut off, after which additional analgesia was given. The failed TAP block cases were excluded from the study. There was highly significant difference ($p<0.001$) in the meantime to the first rescue analgesic dose, with more in the case group (9.70 ± 2.544) as compared to control (6.60 ± 3.209) it means time to first rescue analgesia was longer when TAP block has been applied to the patient.

Keywords: analgesic, TAP, parenteral, abdominal & surgeries.

Study Design: Comparative Study.

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Introduction

Transversus abdominis plane (TAP) block has recently been described as an addition or alternative to the other analgesic regimes. TAP block has shown to be a safe and effective postoperative analgesic technique in a variety of general, gynaecological, urological, plastic and paediatric surgeries and is an integral part of the multimodal anaesthetic approach to enhance recovery after caesarean deliveries. Ultrasound guided approach makes it easier to identify the transversus abdominis plane and administer local anesthetic. [1]

Opioid analgesics are frequently considered for postoperative analgesia. 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. [2] The external oblique muscle is the largest and most superficial of the 3 muscles concerned. It lies below the lower 8 ribs, run inferiorly and insert into the iliac crest. The fibers originating from uppermost ribs have ending as a thick aponeurosis. Aponeurosis of external oblique, transversus abdominis, and internal oblique muscles unite forming the linea alba and the aponeurosis forms the inguinal ligament inferiorly.[3]

It lies directly beneath the internal oblique muscle. It originates from the inguinal ligament, the iliac crest, the lumbodorsal fascia and the inner surfaces of the cartilages from the lower 6 ribs. It takes a transverse course across the abdomen, ending in a broad aponeurosis. This aponeurosis is more lateral in comparison to the aponeuroses of the external and internal oblique muscles. It continues medially and inserts into the lineaalba.[4]

In this variation, the needle entered the skin in an area near the xyphoid and was advanced inferolaterally such that local anaesthetic is delivered to the TAP along the costal margin. Importantly, the lateral abdominal muscle layers give way to an aponeurosis medially so that the TAP is defined by different muscle layers in this area [5-7]. Insome patients, the transversus abdominis muscle extended medially, and the roof of the TAP was formed by the rectus abdominis muscle. In other patients, the transversus abdominis muscle did not extend to the site of local injection, so the plane between the rectus abdominis and the rectus sheath was targeted.

Material and Methods

In the triangle of Petit, a blunt needle were inserted perpendicular to the skin just cephaled to iliac crest and 2 cm behind mid – axillary line. And the transversus abdominis fascial plane was localized with a two pop sensation. First pop indicated penetration of the fascia of external oblique muscle and the second pop indicates penetration of internal oblique muscle and then entering the transversus abdominis fascial plane.[8] in this neurovascular plane, a local anesthetic solution can be injected thus blocking the sensory nerves before innervating the different muscles of the anterior abdominal wall.

A total of 80 patients undergoing elective lower abdominal surgeries were randomized into one of the two groups mentioned below for 01 Year:

Group A (TAP group): were delivered TAP block with 1mg/kg bupivacaine 0.25% bilaterally or unilaterally using a 23 gauge spinal needle in pre-operative period.

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Group B (Parenteral group) were given Parenteral analgesia (tramadol 1mg/kg IV. up to 100mg and diclofenac sodium 1mg/kg up to 75mgi.m).

INCLUSION CRITERIA:

1) Age group 18-60years

2) ASA Grade I and Grade II

EXCLUSION CRITERIA:

1) Patients belonging to ASA Grades III, IV, and V

2) Patient refusal

3) Patients with cardiac dysrhythmias

Result

Table No. 1: Baseline Characteristics

Demographic Variables	**A Group (mean±sd)**	**B Group (mean±sd)**	**P Value**
Age (years)	47.85±15.572	49.10±14.980	.715
Weight (kg)	65.98±4.323	66.78±6.863	.535
Height (cm)	168.85±3.620	167.53±2.195	.051
BMI	23.40±1.582	24.33±2.463	.165
Duration of	46.25±10.558	49.13±8.510	.184

The age, weight, height, BMI and duration of surgery is comparable in both the groups, with no significant difference found (p>0.05)

Table No. 2: Comparison of Mean Preoperative Vitals between two groups

Parameter	**A Group (mean±sd)**	**B Group (mean±sd)**	**P Value**
PR (per/min.)	98.15±9.505	98.08±9.849	.972

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SBP (mmHg)	113.18±6.725	115.43±10.994	.273
DBP (mmHg)	73.75±7.983	74.95±8.887	.527
MBP (mmHg)	86.89±7.133	88.44±8.760	.388
SPO2 (%)	99.30±.687	99.53±.599	.124
RR (per min.)	17.15±1.748	17.53±1.648	.357

Mean PR, SBP, DBP, MBP, SPO2, RR between the two groups does not shows significant difference from each other (p>0.05) they are comparable.

Table No. 3: Comparison of mean Pain Assessment Score between the groups

Parameter	**A Group (mean±sd)**	**B Group (mean±sd)**	**P Value**
4 Hours	1.00±.784	3.20±1.506	.001
8 Hours	3.93±1.639	4.73±.877	.008
12 Hours	3.85±1.331	4.65±1.027	.004
16 Hours	3.40±1.598	4.05±.932	.038
20 Hours	3.95±1.108	5.10±1.892	.048
24 Hours	3.68±1.185	4.08±1.421	.266

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The mean of Pain Assessment Score of the two groups. The mean values of pain score were lower all the times in TAP group and the difference between the two groups is highly significant ($p<0.001$) at 4hr, Significant difference ($p<0.05$) at 8th hr, 12th hr and 16th hr and 20 hours, whereas no significant difference ($p>0.05$) was found at 24th hrs.

Table No. 4: Mean Time to the first Rescue analgesic dose

Parameter	A Group (mean±sd) (hours)	B Group (mean±sd) (hours)	P Value
Mean Time to the first Rescue analgesic dose (hours)	9.70±2.544	6.60±3.209	<0.001

There is a highly significant difference ($p<0.001$) in the meantime to the first rescue analgesic dose, with more in the case group(9.70±2.544) as compared to control (6.60±3.209)

Discussion

Most important component of postoperative care is to control pain. Morbidity and mortality may be increased, if pain is not controlled adequately. Inadequate pain relief may result in respiratory problems, dietary intake and ambulation impairment which consequently lead to complications. In recent times TAP block has emerged as a key tool in any anesthetists' artillery.

We found that difference between mean of pain assessment is highly significant ($p<0.001$) at 4th hr, significant difference ($p<0.05$) was found at 8th, 12 hr and 16 hr. No significant difference ($p>0.05$) was found at 20th hrs and 24th hour but VAS score is always low in TAP group compare to parenteral group in same time slots[9]. These finding shows that TAP block works as a more effective postoperative analgesics compare to total parenteral analgesia. Similar result was found by Bidhan Paul et al. (2014) [10], who conducted a prospective, non-blind, randomized, controlled trial to assess the efficacy of TAP block as a post-operative analgesic. They found that in Post Anesthesia Care Unit (PACU), VAS scores at rest and movement were reduced at all time period ($p\leq 0.01$ to 0.001).Another study which supports our results they concluded that mean visual analog scale (VAS) score of TAP group was statistically less than mean VAS score of parenteral group ($p < 0.001$).

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First rescue analgesia means, analgesia which is administered to the patients on his request, in our study, in parenteral group showed VAS >4 within 5 to 7 hours, so the mean time for first rescue analgesia in parenteral group was 6 hours. whereas in TAP group sustained their analgesic effects up to 9 to 10 hours after that they showed VAS >4 and were treated by IV parenteral analgesic so the mean time for first rescue analgesia in TAP group was 6 hours. It means time to first rescue analgesia was longer when TAP block has been applied to the patients[11-12]. This prolonged duration of analgesia may be due to relatively poor vascularization of transversus abdominis. Because of poor vescularization, less washout of the drug from the plan and less metabolism, this leads to prolong action of the drug when it‘s administered to the TAP plan. Similar result was obtained by Mankikar MG et al. (2016) they concluded that Time for rescue analgesia in the TAP group was prolonged from 4.1 to 9.53 h (P = 0.01631).

Conclusion

All patients were scheduled for postoperative monitoring using a visual analogue scale (VAS) from (0-10) at specific times (4nd, 8th, 12th, 16th 20th 24th) hr postoperatively and the readings were recorded in data collecting sheet. VAS 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 a cut off, after which additional analgesia was given. The failed TAP block cases were excluded from the study. There was highly significant difference ($p<0.001$) in the meantime to the first rescue analgesic dose, with more in the case group (9.70±2.544) as compared to control (6.60±3.209) it means time to first rescue analgesia was longer when TAP block has been applied to the patient.

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