

Comparison of Local Anesthetic Wound Infiltration Versus Transversus Abdominis Plane Block In Patients Undergoing Total Abdominal Hysterectomy

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ABSTRACT

Objective To compare the analgesic effectiveness of local wound infiltration versus transversus abdominis plane (TAP) block after total abdominal hysterectomy (TAH).

Study design Experimental study.

Place & Duration of study Department of Anaesthesiology, Pakistan Institute of Medical Sciences (PIMS) Islamabad, from June 2014 to August 2015.

Methodology Sample size of 52 patients was calculated using WHO calculator. Non probability consecutive sampling was used for patients' selection. Ethical approval was taken from ethical review board of PIMS. Patients were randomly divided into two groups using computer generated random number. Group A was given local anaesthetic infiltration with 0.6ml/kg of 0.25% bupivacaine and Group B was given transverse abdominal plane block (TAP) bilaterally with 18G needle piercing cephalic to iliac crest skin for about 2 inches. Data was analysed using SPSS version 22. Student t test was applied and $p < 0.05$ was considered significant.

Results Total of 52 patients were included in the study with 1:1 randomization (26 patients in each group). There were 30 (58%) males and 22 (42%) females. Mean age of patients was 44.4 ± 7.3 year. Significantly longer T rescue time was noted in TAP block (148 ± 46.7 minutes) as compared to infiltration (85.3 ± 38 minutes - $p=0.003$). Significantly lower mean pain scores were reported in TAP block (4.12 ± 1.4) as compared infiltration (5.58 ± 1.98 - $p=0.001$). Sedation was found better in TAP block as compared to infiltration ($p < 0.05$).

Conclusions TAP block is an effective multimode analgesic in terms of pain reduction, sedation and T rescue after total abdominal hysterectomy. The process is reliable, easy to perform and provide effective analgesia. No complications and side effects were reported with TAP block.

Key words Hysterectomy, TAP block, Analgesic-postoperative.

INTRODUCTION:

Total abdominal hysterectomy is second major surgical procedure performed worldwide.¹ It is very

common non pregnancy related surgery in United States Globally, 600,000 total abdominal hysterectomies are performed every year with an estimated cost of 5 billion dollar every years.² A significant decrease in incidence of hysterectomy was observed from year 2000-2004, worldwide.³ Frequency of total abdominal hysterectomy in Pakistan is about 13.5%.⁴ Most common indications for total abdominal hysterectomy include non-cancerous uterine infection, fibroids, prolapse and endometriosis leading uterine bleeding, emotional stress, pain and severe discomfort.⁵

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The surgical procedure involves removing cervix and uterus, and in some cases fallopian tubes and ovaries as well. Abdominal hysterectomy is a standard approach and basic component of armamentarium of surgeons.⁶ The procedure is associated with several risks and mortality is also reported. It leads to sterility in premenopausal women. Postoperative pain is associated with surgical incision. Transverse abdominis plane (TAP) block and local anaesthetic infiltration are effective for pain relief after abdominal hysterectomy. TAP block leads to sensory nerve supply blockage to abdominal wall (anterior) and local anaesthetic infiltration relieves pain at surgical site as a part of multimodal analgesic approach.⁷

Skjelsager et al reported that TAP block had shown significantly (dynamic) pain scores reduction at 8 and 24 hours as compared to local anaesthetic infiltration ($p=0.00$).⁸ Atim et al reported that TAP block had shown significantly lower cumulative morphine consumption as compared to local anaesthetic infiltration ($p=0.004$).⁹ Sivapurapu et al reported that TAP leads to significant reduction in sedation scores (at 2-4 hours postoperatively) as compared to local anaesthetic infiltration ($p=0.001$).¹⁰

Limited data is available on this issue from Pakistan. This study was designed to test the hypothesis that TAP block as part of multimodal analgesic regimen of direct infiltration of surgical incision with local anaesthetic, is effective in pain relief.

METHODOLOGY:

A randomized controlled trial (double blind) was conducted in Department of Anaesthesiology Pakistan Institute of Medical Sciences (PIMS), Islamabad from June 2014 to June 2015. Non probability consecutive sampling was used for patients' selection. Sample size of 52 patients was

calculated using WHO calculator. Ethical approval was taken from ethical review board of PIMS. Consent was obtained from all the selected patients. Patients of age > 18 years, both genders and patients suitable for anaesthesia in total abdominal hysterectomy, were included in study. Patients with diabetes mellitus, hypertension, pregnant and breast feeding mothers, and those with history of drug allergy and opioids intolerance were excluded. Patients were randomly divided into two groups using computer generated random number. Group A was given local anaesthetic infiltration with 0.6ml/kg of 0.25% bupivacaine and Group B was given transverse abdominal plane block bilaterally with 18G needle piercing cephalic to iliac crest skin (2 inches). Bupivacaine 0.25% with volume of 0.6ml/kg was divided into two doses and administered on either side of the patient. Patients were followed for mean pain scores using visual analogue scale, sedation and time for first request for analgesia in minute (Rescue).

Data was analysed using SPSS version 22.0. Mean and standard deviation were calculated for quantitative variables. Frequency and percentages were calculated for qualitative variables. Student t-test was applied for comparison of mean between the two groups. A p value <0.05 was considered significant.

RESULTS:

A total of 52 patients were included in the study with 1:1 randomization (26 patients in each group). There were 30(58%) males and 22(42%) females. Mean age of patients was 44.4 ± 7.3 year. An insignificant difference was found in the age of Group A (44.25 ± 9.04 year) and Group B (42.15 ± 8.33 year) with $p=0.396$. Insignificant difference in weight of Group A (56.68 ± 7.69 kg) and Group B (56.88 ± 11 kg) with $p=0.664$. No complication was found in both

Table I: Baseline Patients' Characteristics

Group / Variables	TAP Block (Group T) n=26	Infiltration (Group I) n=26	P value
Age (Year)	42.15 ± 8.33	44.25 ± 9.04	p=0.396
Weight (Kg)	56.88 ± 11.67	56.68 ± 7.69	p=0.664

Table II: Comparison of Variables

Group / Variables	TAP Block (Group T)	Infiltration (Group I)	P value
T rescue (min)	148 ± 46.7	85.38 ± 38.07	0.003
VAS at T rescue (mm)	4.12 ± 1.4	5.58 ± 1.98	0.003
24 hours Morphine (mg)	22.15 ± 4.14	29.15 ± 3.93	0.001

the groups as shown in table I.

A significant 24 hour reduction in nalbuphine requirement was seen among patients who underwent TAP block. Significantly longer T rescue time was noted in TAP block (148 ± 46.7 minute) as compared to infiltration (85.3 ± 38 minute - $p=0.003$). Significantly lower mean pain scores were reported in TAP block (4.12 ± 1.4) as compared to infiltration (5.58 ± 1.98 - $p=0.001$). These are shown in table II.

Morphine requirement after 24 hours was reduced in TAP block group (22.15 ± 4.14 mg) as compared to Group A (29.15 ± 3.93 mg - $p=0.001$). Sedation was better in TAP block as compared to infiltration ($p<0.05$).

DISCUSSION:

Present RCT reported that TAP block provided effective analgesic effect when used as analgesic regimen among patients of total abdominal hysterectomy. However similar studies reported high TAP efficacy as compared to other analgesics.¹¹ In present study TAP block resulted in less consumption of morphine in postoperative patients with lowered mean pain scores and showed improvement in 1st supplemental analgesia requirement ($p<0.05$). Evidence exists that TAP block had better quality and its effects were longer in duration as compared to local anaesthetics.¹²

Postoperative analgesia (current regimen) after total abdominal hysterectomy consists of patients controlled analgesia (PCA) morphine along with non steroid analgesic and acetaminophen combination. Usually patients need PCA morphine for approximately 48 hours after that patients are shifted to oral analgesic.¹³ Postoperative opioids are effective adjunctive strategy after total abdominal hysterectomy as reported in a study.¹⁴

Present study reported that morphine requirement after 24 hours was reduced in TAP block group as compared to infiltration. Forero et al reported that TAP block is an excellent analgesic in patients undergoing radical prostatectomy, caesarean delivery and colonic resection surgery involving midline abdominal wall incision.¹⁵

In present study, a significant 24 hour reduction in nalbuphine requirement was seen among patients undergone TAP block. Significantly longer T rescue time was seen in TAP block as compare to infiltration. A similar study reported effective postoperative nalbuphine consumption reduction after total abdominal hysterectomy. Transversus abdominis

neurofascial plane act as depot along with its contents, resulting in high vascularisation and higher local absorption of anaesthesia as compared to surgical incision.¹⁶

In present study, significantly lower mean pain scores were reported in TAP block (4.12 ± 1.4) as compared infiltration (5.58 ± 1.98 - $p=0.001$). Carney reported that TAP block is effective in reducing postoperative pain as compared to placebo after total abdominal hysterectomy.¹⁷ A meta analysis reported that TAP block is effective in relieving pain and lowering side effects as compared to morphine.¹⁸

Limitation of this study are small sample size and shorter duration of follow ups. This limits generalizability of present study. A large sample size and long follow up is therefore recommended for further research.

CONCLUSIONS:

TAP block is an effective multimode analgesic in terms of pain reduction, sedation and T rescue after total abdominal hysterectomy. The process is reliable, easy to perform and provide effective analgesia. No complication and side effect were reported with TAP block.

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 Iqbal Memon: Drafting and revising the manuscript.
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Conflict of Interest:

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