

Original Research

A comparative study of analgesic effect of ESPB with TPVB in breast surgery

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ABSTRACT:

Background: Breast cancer is the most commonly diagnosed cancer and the second most common cause of cancer death in women. The present study was conducted to compare the analgesic effect of ESPB with TPVB in breast surgery. **Materials & Methods:** 60 adult female patients scheduled for unilateral modified radical mastectomy were divided into 2 groups of 30 each. Group I were those who received TPVB and group II received ESPB. Parameters such as post-operative 24 hours morphine consumption, intra-operative fentanyl consumption, time of the first request for analgesia and complications were recorded. **Results:** The mean BMI in group I patients was 27.2 Kg/m² and in group II was 28.5 Kg/m². ASA grade I was seen in 22 in group I and 21 in group II and II in 8 in group I and 9 in group II. Duration of surgery was 174.2 minutes in group I and 170.2 minutes in group II. The intra- operative fentanyl consumption (μ g) was 139.3 in group I and 134.2 in group II, total post- operative morphine (mg) was 27.2 in group I and 26.5 in group II. Time to first analgesic request was 6.32 hours in group I and 6.51 hours in group II. Nausea was seen in 10 in group I and 9 in group II, vomiting 4 in group I and 3 in group II and pneumothorax 3 in group I and 1 in group II. The difference was non- significant ($P > 0.05$). **Conclusion:** Both TPVB and ESPB provide effective pain control after breast surgeries.

Key words: Cancer, Fentanyl, Nausea

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INTRODUCTION

Breast cancer is the most commonly diagnosed cancer and the second most common cause of cancer death in women in North America.¹ Trials have established that breast conservation therapy (BCT) and mastectomy offer equivalent survival and can be viewed as equivalent treatments in early stage breast cancer (ESBC). With equivalence of treatments, surgery for ESBC is often viewed and described as a preference-sensitive care.²

The choice of mastectomy versus BCT is a complicated decision-making process; administrators should look beyond just mastectomy rates and aim to understand the reason behind these variations. There are some key factors in the literature including patient sociodemographic factors, geographic factors, role of the surgeon, role of reconstruction, and influence of magnetic resonance imaging use.³

Breast surgery for malignancy is usually performed under general anaesthesia, and is associated with

considerable post-operative pain, nausea and vomiting (PONV). Of the various local and regional anaesthetic techniques evaluated in the past to reduce post-operative pain after breast surgery, thoracic PVB appears promising due to reduction in post-operative pain, decreased opioid consumption with reduction in PONV, drowsiness, risk of respiratory depression and cost saving.^{4,5} Additional advantages reported include decrease in the incidence of chronic post-surgical pain and improvement in subcutaneous oxygenation in the wound site thus possibly reducing infection risk and improving wound healing.⁶ Post-mastectomy analgesia consists of many regional techniques. Paravertebral block (PVB) is the most effective studied technique, but due to its anatomic proximity to pleura and central neuroaxial system, it is a challenging one. Erector spinae plane block (ESPB) has been used successfully for post-operative analgesia in breast surgeries.⁷ The present study was

conducted to compare the analgesic effect of ESPB with TPVB in breast surgery.

MATERIALS & METHODS

The present study comprised of 60 adult female patients scheduled for unilateral modified radical mastectomy. All belonged to the American Society of Anesthesiologists' (ASA) physical status I or II. All were informed regarding the study and their written consent was obtained.

Data such as name, age, etc. was recorded. Patients were divided into 2 groups of 30 each. Group I were those who received TPVB and group II received ESPB. Parameters such as post-operative 24 h morphine consumption, intra-operative fentanyl consumption, time of the first request for analgesia and post-operative visual analogue scale (VAS), heart rate (HR), mean blood pressure (MBP) and complications were recorded. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Groups	Group I	Group II
Method	TPVB	ESPB
Number	30	30

Table I shows that group I patients received TPVB and group II received ESPB. Each group had 30 patients.

Table II Comparison of parameters

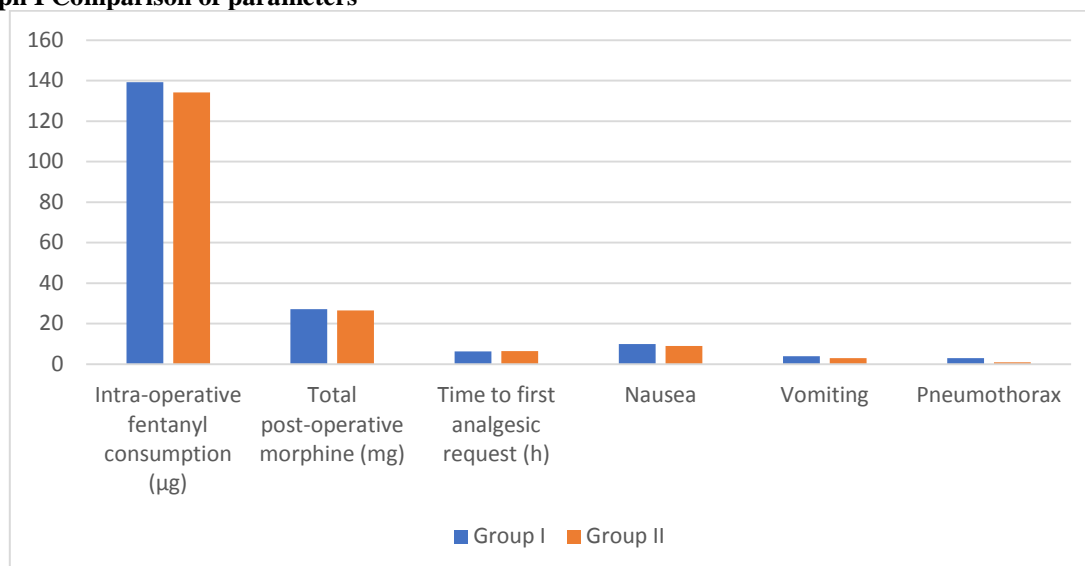
Parameters	Group I	Group II	P value
BMI (Kg/m ²)	27.2	28.5	0.81
ASA I	22	21	0.05
II	8	9	
Duration of surgery (min)	174.2	170.2	0.91

Table II shows that mean BMI in group I patients was 27.2 Kg/m² and in group II was 28.5 Kg/m². ASA grade I was seen in 22 in group I and 21 in group II and II in 8 in group I and 9 in group II. Duration of surgery was 174.2 minutes in group I and 170.2 minutes in group II. The difference was non- significant (P> 0.05).

Table III Comparison of parameters

Parameters	Group I	Group II	P value
Intra- operative fentanyl consumption (µg)	139.3	134.2	0.15
Total post- operative morphine (mg)	27.2	26.5	0.21
Time to first analgesic request (h)	6.32	6.51	0.17
Nausea	10	9	0.15
Vomiting	4	3	
Pneumothorax	3	1	

Table III, graph I shows that intra- operative fentanyl consumption (µg) was 139.3 in group I and 134.2 in group II, total post- operative morphine (mg) was 27.2 in group I and 26.5 in group II. Time to first analgesic request was 6.32 hours in group I and 6.51 hours in group II. Nausea was seen in 10 in group I and 9 in group II, vomiting 4 in group I and 3 in group II and pneumothorax 3 in group I and 1 in group II. The difference was non- significant (P> 0.05).

Graph I Comparison of parameters

DISCUSSION

The most commonly used agent for PVB has been 0.5% bupivacaine, and has the risk of systemic toxicity when administered in large doses. Adjuvants like fentanyl or clonidine improved the quality of blockade; however, they are associated with hypotension and nausea.⁸ Continuous infusion of lower concentrations of local anaesthetics decreases the risk of systemic toxicity. Barlacu et al⁹ used levobupivacaine with fentanyl 4 µg/ml infusion for post-operative analgesia paravertebrally, and reported that patients experienced side-effects like nausea and pruritus. They had suggested that further work is required to determine the lowest effective dose of fentanyl. When plasma concentrations of levobupivacaine, fentanyl 2 µg/ml and clonidine were analysed following PVB during breast surgery, it was found that plasma levels of levobupivacaine were within the safe range, and plasma levels of fentanyl and clonidine were less than the effective levels after IV administration, suggesting that their analgesic effect may be partly attributed to a peripheral mechanism of action. The present study was conducted to compare the analgesic effect of ESPB with TPVB in breast surgery.

In present study group I patients received TPVB and group II received ESPB. Each group had 30 patients. Ghamry et al¹⁰ compared the effect of ESPB with TPVB in post-mastectomy acute pain control. Patients were randomised into two groups, receiving 20 ml of 0.25% bupivacaine: group I (TPVB) and group II (ESPB). Post-operative 24 h morphine consumption, intra-operative fentanyl consumption, time of the first request for analgesia and post-operative visual analogue scale (VAS), heart rate (HR), mean blood pressure (MBP) and complications were recorded. Results: Post-operative 24 hours morphine consumption and time of the first request for analgesia were comparable between both groups ($P = 0.32$ and 0.075 , respectively). There was no significant

difference in the intra-operative fentanyl consumption. There was also no significant difference in VAS between both groups over the 24 hours of study. Four patients in group I developed pneumothorax with no significant differences between both groups ($P = 0.114$). Incidence of nausea and vomiting was comparable between both groups. All patients displayed a stable haemodynamic profile.

We found that mean BMI in group I patients was 27.2 Kg/m² and in group II was 28.5 Kg/m². ASA grade I was seen in 22 in group I and 21 in group II and II in 8 in group I and 9 in group II. Duration of surgery was 174.2 minutes in group I and 170.2 minutes in group II. Gurkan et al¹¹ found that total 24 hours morphine consumption decreased by 65% in patients who received single-shot US-guided ESPB using 20 ml of 0.25% bupivacaine after breast surgery. However, there was no significant difference in pain scores between the ESPB group and the control group.

Melvin et al¹² concluded in their case series study that pre-incision ESPB administered at the T10–T12 level provided effective perioperative opioid-sparing analgesia in patients undergoing lumbosacral spine surgery. Catheter insertion was used in more major surgeries and patients suffering complex pain to prolong the duration of analgesia and avoid opioid dose escalation.

CONCLUSION

Authors found that both TPVB and ESPB provide effective pain control after breast surgeries.

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