

Original Research

Thoracic epidural block vs paravertebral block in patients of breast surgery

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ABSTRACT:

Background: Thoracic paravertebral block (PVB) and thoracic epidural appears promising due to reduction in post-operative pain, decreased opioid consumption with reduction in PONV, drowsiness, risk of respiratory depression and cost saving. The present study was conducted to compare thoracic epidural block vs paravertebral block in patients of breast surgery. **Materials & Methods:** 72 females selected for unilateral breast surgery were classified into 2 groups of 36 each. Group I patients received thoracic epidural single shot at T4 level using 2ml/segment of 0.5% ropivacaine and group II patients received thoracic single shot paravertebral block at T2 level using 0.3 ml/kg of 0.5% ropivacaine. Parameters such as mean blood pressure, respiratory rate, Ramsey sedation score, performance time, induction time, duration of surgery, total propofol required, total fentanyl required etc. was recorded. **Results:** Duration of surgery (min) was 70.2 and 69.0, performance time (min) was 7.04 and 6.12, systolic blood pressure (mm Hg) was 114.6 and 126.4, respiratory rate (breath/min) was 20.1 and 19.3, Ramsey sedation score was 1.61 and 1.89, induction time (min) was 16.7 and 17.4, total propofol required (mg) was 124.2 and 143.5, total fentanyl required (μ g) was 121.5 and 123.8, total fluid (RL) required (l) was 1.98 and 1.41, time to rescue analgesic (min) was 306.4 and 304.2 and patient satisfaction score was 87.5 and 85.2 in group I and II respectively ($P < 0.05$). Nausea/ vomiting was seen in 7 in group I and 1 in group II. Hypotension requiring vasopressors was seen in 8 in group I and 2 in group II. The difference was significant ($P < 0.05$). **Conclusion:** Both epidural and paravertebral provide optimal surgical condition and analgesia along with good patient satisfaction.

Key words: Epidural anaesthesia, paravertebral anaesthesia, Breast surgery

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INTRODUCTION

Breast surgery is usually performed under general anaesthesia and is associated with considerable post-operative pain, nausea and vomiting (PONV) along with physical, psychological and immunological depression.¹ So there is a search for optimal regional techniques for breast surgeries which would reduce PONV and also provide post-operative sensory block, minimizing narcotic requirements of the various local and regional anaesthetic techniques evaluated in the past to reduce post-operative pain after breast surgery, thoracic paravertebral block (PVB) and thoracic epidural appears promising due to reduction in post-operative pain, decreased opioid consumption with reduction in PONV, drowsiness, risk of respiratory depression and cost saving.²

The fact that the paravertebral space communicates freely with the epidural space through the intervertebral foramina should alert clinicians administering local anesthetics into the paravertebral space, whether percutaneously (blindly or ultrasound guided) or under direct vision intraoperatively, that a paravertebral block (PVB) often becomes an epidural block, unilateral or bilateral, and may under certain circumstances also result in total spinal anaesthesia.³ PVB is currently being touted as the preferred method for pain relief after thoracic surgery. In Epidural blockade the drug is injected into spinal epidural space which extends from the foramen magnum to the sacral hiatus and surrounds the durameter anteriorly, laterally and posteriorly.⁴ The depth varies depending on the body habitus. The primary site of action is the

spinal nerve roots. Sensory blockade blocks painful stimuli, whereas motor blockade provides muscle relaxation with a varying degree of sympathetic blockade.⁵ The present study was conducted to compare thoracic epidural block vs paravertebral block in patients of breast surgery.

MATERIALS & METHODS

This study consisted of 72 females selected for unilateral breast surgery. They were made aware of the study and their written consent was obtained.

All were classified into 2 groups of 36 each. Group I patients received thoracic epidural single shot at T4 level using 2ml/segment of 0.5% ropivacaine and group II patients received thoracic single shot paravertebral block at T2 level using 0.3 ml/kg of 0.5% ropivacaine. Parameters such as mean blood pressure, respiratory rate, Ramsey sedation score, performance time, induction time, duration of surgery, total propofol required, total fentanyl required etc. was recorded. Results were analysed statistically. P value less than 0.05 was considered significant.

RESULTS

Table I Comparison of parameters

Parameters	Group I	Group II	P value
Duration of surgery (min)	70.2	69.0	0.12
Performance time (min)	7.04	6.12	0.09
Systolic blood pressure (mm Hg)	114.6	126.4	0.15
Respiratory rate (breath/min)	20.1	19.3	0.11
Ramsey sedation score	1.61	1.89	0.82
Induction time (min)	16.7	17.4	0.70
Total propofol required (mg)	124.2	143.5	0.12
Total fentanyl required (μ g)	121.5	123.8	0.10
Total fluid (RL) required (l)	1.98	1.41	0.02
Time to rescue analgesic (min)	306.4	304.2	0.13
Patient satisfaction score	87.5	85.2	0.93

Table I, graph I shows that duration of surgery (min) was 70.2 and 69.0, performance time (min) was 7.04 and 6.12, systolic blood pressure (mm Hg) was 114.6 and 126.4, respiratory rate (breath/min) was 20.1 and 19.3, Ramsey sedation score was 1.61 and 1.89, induction time (min) was 16.7 and 17.4, total propofol required (mg) was 124.2 and 143.5, total fentanyl required (μ g) was 121.5 and 123.8, total fluid (RL) required (l) was 1.98 and 1.41, time to rescue analgesic (min) was 306.4 and 304.2 and patient satisfaction score was 87.5 and 85.2 in group I and II respectively ($P < 0.05$).

Graph I Comparison of parameters

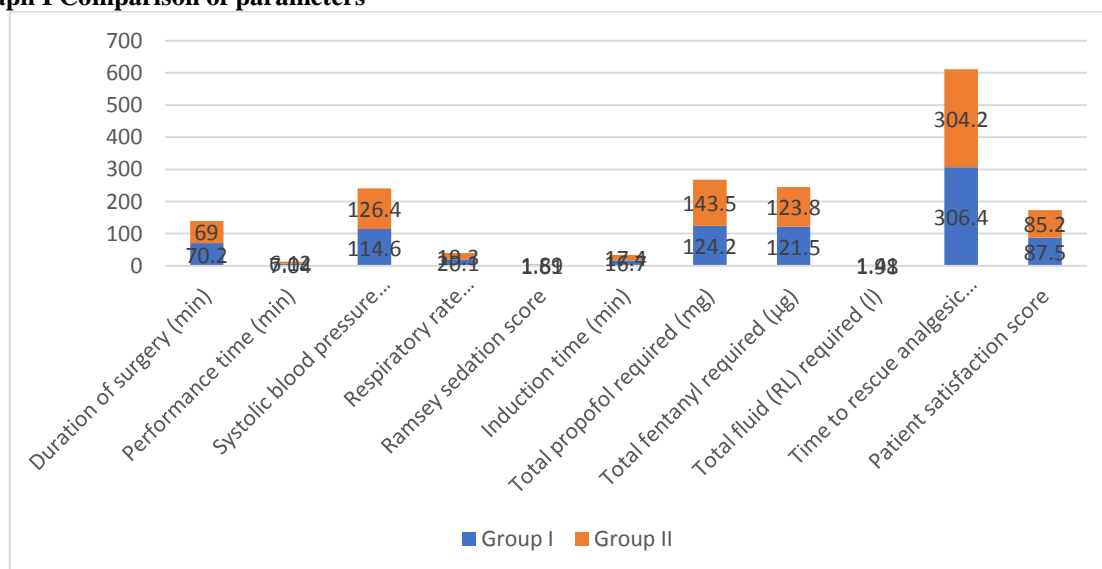
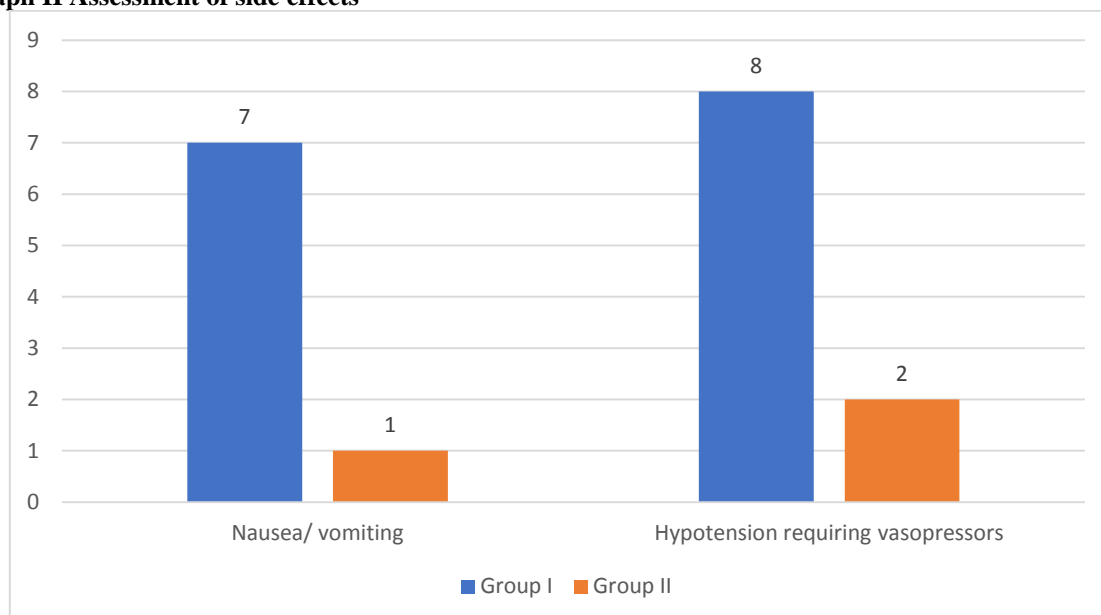


Table II Assessment of side effects

Side effects	Group I	Group II	P value
Nausea/ vomiting	7	1	0.02
Hypotension requiring vasopressors	8	2	0.01

Table II, graph II shows that nausea/ vomiting was seen in 7 in group I and 1 in group II. Hypotension requiring vasopressors was seen in 8 in group I and 2 in group II. The difference was significant ($P < 0.05$).

Graph II Assessment of side effects**DISCUSSION**

Thoracic movement, intercostal nerve injury, and thoracic catheter-induced pleura stimulation can cause severe pain in patients after thoracic surgery,¹ resulting in chronic pain in up to 50% of patients after thoracotomy. TEA is recommended by relevant guidelines as the gold standard of analgesia after thoracotomy.⁶ Video-assisted thoracoscopic surgery (VATS) is superior to thoracotomy in improving patient outcomes and reducing pain and has become the main surgical approach. However, postoperative pain is still an issue. Pain increases the incidence of hypoxemia and hypercapnia, increases myocardial oxygen consumption, and increases the risk of arrhythmia and myocardial ischemia.⁷ Therefore, reducing postoperative pain reduces bed rest and pulmonary complications. As the first choice for analgesia after thoracotomy, TEA is associated with major complications, and its application is limited by complications such as epidural hematoma and the potential for severe spinal cord injuries.⁸ The present study was conducted to compare thoracic epidural block vs paravertebral block in patients of breast surgery.

In present study, duration of surgery (min) was 70.2 and 69.0, performance time (min) was 7.04 and 6.12, systolic blood pressure (mm Hg) was 114.6 and 126.4, respiratory rate (breath/min) was 20.1 and 19.3, Ramsey sedation score was 1.61 and 1.89, induction time (min) was 16.7 and 17.4, total propofol required (mg) was 124.2 and 143.5, total fentanyl required (μ g) was 121.5 and 123.8, total fluid (RL) required (l) was 1.98 and 1.41, time to rescue analgesic (min) was 306.4 and 304.2 and patient satisfaction score was 87.5 and 85.2 in group I and II respectively. Soni et al⁹ compared thoracic PVB with epidural block in a double-blinded, prospective, randomized study of 60 women scheduled for unilateral breast surgery. Patients were divided into two groups of 30 each,

Group E (Thoracic epidural group), Group P (Thoracic paravertebral group), each who received 15ml of 0.5% Ropivacaine either in the thoracic epidural region or thoracic paravertebral region. Patients receiving epidural showed a fall in mean arterial pressure leading to significant p-value at 10, 20, 30, 40, 50 min, 1hr, 1 hr PO. The fall was soon addressed with fluid bolus and if not responding vasopressors were given in form of 6 mg mephentermine. In Group E 33% (10/30) patients required vasopressors as compared to 0% (0/30) in Group P. The analgesic profile of the two regional technique were similar in both groups. In Group E (20%) patient experienced Nausea and Vomiting which was more than Group P (7%).

We found that nausea/ vomiting was seen in 7 in group I and 1 in group II. Hypotension requiring vasopressors was seen in 8 in group I and 2 in group II. Kitowski et al¹⁰ analysed the analgesic effects of TEA versus TPVB after thoracoscopic surgery. A total of 458 patients from five RCTs were included in this study. After thoracoscopic surgery, the numerical rating scale (NRS) score for resting pain was higher in the TPVB group than in the TEA group at 1– 2 hours and 4– 6 hours after surgery (MD = 0.44, 95% CI = 0.24 to 0.64, P < 0.0001, I² = 0%; MD = 0.47, 95% CI = 0.23 to 0.70, P < 0.0001, I² = 0%). The postoperative 24-hour usage of morphine was higher in the TPVB group than in the TEA group (SMD = 0.67; 95% CI = 0.03 to 1.31; P = 0.04; I² = 84%). The incidence of hypotension was significantly lower in the TPVB group than in the TEA group (OR = 4.52; 95% CI = 2.03 to 10.10; P = 0.0002; I² = 0%). No significant between-group difference was observed in postoperative nausea and vomiting (PONV).

Pintaric TS et al¹¹ compared continuous thoracic epidural with paravertebral block on perioperative analgesia and hemodynamic stability in patients having open lung surgery. Casati A et al¹² in their

study patient satisfaction with the technique was 8.5 (8-9.8) cm in group EPI and 9 (7.5-10) cm in group PVB (P = 0.65).

CONCLUSION

Authors found that both epidural and paravertebral provide optimal surgical condition and analgesia along with good patient satisfaction.

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