

To Study the Thoracic Epidural Analgesia for Breast Oncological Procedures: A Better Alternative to General Anesthesia - A Comparison between Thoracic Epidural and General Anesthesia

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Abstract: *Introduction:* Breast cancer is the most common cancer in elderly women and the incidence of breast cancer is increasing in India. Aim of the study is to compare general anaesthesia and thoracic epidural anaesthesia in patients undergoing breast cancer surgeries. *Methods:* Adult women patients from ASA I and II between ages 30 - 65 years of age were enrolled for the study. Thoracic epidural was given to patients in group - I (n=30) and general anesthesia to group II - (n=30). Intraoperative hemodynamic parameters, side effects like nausea and vomiting, hemodynamic stability, quality of postoperative analgesia were recorded. *Results:* Postoperative incidence of nausea and vomiting was more in general anesthesia group. The intensity of pain and consumption of analgesics were lower in the thoracic epidural group. Incidence of heart rate variability and hypotension were more common in thoracic epidural group as compared to general anesthesia group whereas hypertension was more frequent among general anesthesia group. *Conclusion:* The thoracic epidural technique not only provided hemodynamic stability, decreased the incidence of post op nausea and vomiting but also significantly enhanced intraoperative and postoperative analgesia.

Keywords: General anaesthesia, thoracic epidural anaesthesia, xylocaine, postoperative analgesia, haemodynamic stability

1. Introduction

Breast cancer is the most common cancer in elderly women³ and the incidence of breast cancer is increasing in India. Routinely definitive breast cancer surgeries have been performed under general anesthesia. However, general anesthesia does not eliminate the surgical stress response and the need for drugs to culminate postoperative pain may cause undesirable side effects such as nausea, vomiting, sedation and respiratory depression.

Thoracic epidural allows utilization of incremental doses of local anesthetic agent which offers preservation of the respiratory function⁸. It provides excellent pain relief without impairing respiration^{5,6,9}.

It has beneficial effects to those who have difficult airway, compromised cardiac and pulmonary reserve and elderly patients². Thoracic epidural selectively blocks cardiac acceleratory fibers and this offers attenuation of the surgical stress response, improvement of myocardial oxygen balance and preserves hemodynamic parameters.

The present study compared thoracic epidural block and general anaesthesia in female patients undergoing breast cancer surgeries with axillary exploration.

Aims and Objectives

To compare general anaesthesia and thoracic epidural anaesthesia in patients undergoing breast cancer surgeries on

the basis of

- 1) Intraoperative hemodynamic parameters
- 2) Side effects like nausea and vomiting hemodynamic stability.
3. Quality of postoperative analgesia

2. Material & Methods

After obtaining informed consent, adult women patients from ASA I and II between ages 30 - 65 years of age were enrolled for the study. Exclusion criteria were patient refusal, infection at the site of epidural placement, coagulation disorder, known allergy to bupivacaine and difficult airway. Before surgery, all the patients were instructed regarding benefits of thoracic epidural over general anesthesia by surgeon and the anesthesiologist. Thoracic epidural was given to patients in group - I (n=30) and general anesthesia to group II - (n=30). All patients were preloaded with RL[at]10 - 20 ml/kg/h and mild sedation was given with 1 - 2 mg of injection midazolam. Hemoglobin was checked and ECG, saturation (SpO₂) and non - invasive blood pressure were monitored regularly for every patient. After that patients were given respective anaesthesia techniques.

Group I:

Thoracic epidural block was performed in sitting position. A18 G Touhy needle was inserted in mid - line/paramedian approach at level of T5 - T6 or T6 - 7 inter - vertebral space. The loss of resistance technique was used to identify thoracic epidural space. An epidural catheter was introduced

3 - 5 cm into epidural space using Touhy needle. A test dose 3 ml of 2% Xylocaine with adrenaline 1: 200000 was given to exclude the intravascular and intrathecal injection. The catheter was secured and 10 - 15ml of 0.5% bupivacaine was administered in 5 ml fractions testing the anesthesia level (adequate analgesia from the lower border of the clavicle to inferior costal margin). Oxygen[at]3 - 6 L/ min was administered during the surgery. General anesthesia was administered for any patient who experienced discomfort. If the patient experienced pain or discomfort during axillary exploration the area was infiltrated with 5 - 10 ml of 1% lignocaine with adrenaline anesthetic agent and injection propofol 0.5 - 1mg/ kg until sedated. Epidural Catheter was used for post - operative analgesia with 5ml/hr of 0.125% bupivacaine.

Group - II:

All patients receiving general anesthesia were pre - medicated with injection glycopyrrolate 0.2mg, injection ondansetron 4 mg intravenously 60 minutes before surgery and induced with injection fentanyl 1 - 2 mcg/kg followed by propofol 2 - 2.5 mg/kg intravenously. Tracheal intubation was facilitated using succinylcholine 1 - 1.5 mg / kg. Anaesthesia was maintained using isoflurane along with admixture of oxygen and nitrous oxide. Atracurium 0.5mg/kg was administered intravenously for muscle relaxation. Neostigmine 0.05 mg/ kg with glycopyrrolate 0.01mg/ kg were injected intravenously for reversal of neuromuscular blockade. 75 mg of injection diclofenac was administered intravenously for post - operative pain whenever required.

During the surgery, patient satisfaction, the need of supplementary sedation, hemodynamic variability (tachycardia, represented by a heart rate greater than 100 bpm; bradycardia, heart rate below 50 bpm; hypotension defined as 20% drop in base line blood pressure; and hypertension, a 20% increased in base line blood pressure) and other side effects such as pruritus, nausea and vomiting were recorded for both groups. Postoperatively quality of analgesia was evaluated by verbal analogue scale that included very strong pain; mild pain, absence of pain and the analgesic consumption were recorded. Statistical analysis was performed using statistical package of social sciences version 21. Quantitative parameters were performed using student's t - test whereas qualitative parameters are compared using Chi square test. P value as less than 0.05 was considered statistically significant

3. Results

Demographic data showed no significant differences in both groups Demographic data Table 1

	GA Group	Epidural Group	P Value
Age (Years)	58 + 9	63 + 6	0.20 (>0.05)
Weight (Kgs)	72 + 11	76 + 14	0.916 (>0.05)
Height (cms)	161 + 10	158 + 9	0.232 (>0.05)
ASA			
I	17	16	
II	13	14	P > 0.05

Incidence of heart rate variability (tachycardia and bradycardia) was more common in thoracic epidural group

as compared to general anesthesia group. Incidence of hypotension was more frequent in thoracic epidural whereas hypertension was more frequent among general anesthesia group. In epidural group all patients needed supplementary sedation, most of them before the beginning of surgery.

Table 2: Intraoperative Patients Characteristics

	GA Group	Epidural Group	P Value
Axillary Supplementation	0	6 (20%)	2.023 (>0.05)
Sedation	0	30 (100%)	0.0001 (<0.05)
Hypertension	9 (30%)	0	0.0001 (<0.05)
Hypotension	3 (10%)	18 (60%)	0.0001 (<0.05)
Tachycardia	1 (3%)	3 (10%)	0.6120 (>0.05)
Bradycardia	3 (10%)	12 (40%)	0.0153 (<0.05)
	30	30	

Table 3: Postoperative Patients Characteristics

	GA	EPI	P Value
Nausea	12 (40%)	3 (10%)	0.0001 (<0.05)
Vomiting	15 (50%)	3 (10%)	0.0015 (<0.05)
Discharge from recovery room (in minutes)	116 + 12	50 + 20	
Satisfied	20	25	0.2326 (>0.05)

Table 4: Pain Severity

	Very Strong		Strong		Mild		Absent	
	GA	EPI	GA	EPI	GA	EPI	GA	EPI
Recovery Room	6	0	10	0	14	0	0	30
6 hr	6	0	9	1	10	3	5	26
12 hr	10	0	6	3	4	3	10	24

Post operative incidence of nausea and vomiting was more in general anesthesia group. The intensity of pain and consumption of analgesics were lower in the thoracic epidural group. Reduced length of hospital stay was reported in thoracic epidural group. Satisfaction with anesthesia was similar in both the groups. There was no incidence of respiratory depression, back pain and urinary retention.

4. Discussion

Our study demonstrated that thoracic epidural has advantages over general anesthesia for oncological mastectomies with axillary emptying. The incidence of breast cancer has been increasing in females. Surgery is the main stay of treatment and the current trend is towards radical procedures.

The anesthetic technique should provide adequate intra - operative anesthesia and good post - operative analgesia without collateral effects and with reduced hospital stay. Due to the sympathetic blockade caused by the thoracic epidural block.

The clinical benefits of thoracic epidural include an effective postoperative analgesia, lower incidence of pulmonary complications, stabilization of endothelial coronary function, earlier return of bowel function, preservation of immune competence, early ambulation and a reduction in the cost of perioperative care. It is reported to have improved hemodynamic stability. It also blocks stress response of surgery and provides excellent postoperative analgesia. The practice of thoracic epidural has been increasing in recent

years. High thoracic epidural can be used to avoid endotracheal intubation and offers less respiratory complications. It can provide adequate anesthesia with minimal effect and without patient discomfort because surgery of breast does not require motor blockade. The incidence of hypotension was high (60%) however it was easily controlled by lower dose of vasopressor.

Similarly ¹Doss NW, Ipe J, Crimi T et al studied continuous thoracic epidural anesthesia with 0.2% Ropivacaine versus general anesthesia for perioperative management of modified radical mastectomy and had similar results.¹²Sundarathiti et al. found no difference in the incidence of hypotension and bradycardia between general anaesthesia and thoracic epidural groups. Respiration was also not significantly affected demonstrating that thoracic epidural can be safely used in respiratory compromised patients.¹⁴Groeben H, Schuafer B et al studied lung function under high thoracic segmental epidural anesthesia with Ropivacaine or Bupivacaine in patients with severe obstructive pulmonary disease undergoing breast surgery and had similar results.

The patients undergoing regional anesthesia were discharged earlier than general anesthesia and is more cost effective.

5. Conclusion

Our study showed that thoracic epidural anesthesia can be safely used in women undergoing modified radical breast surgeries.

The thoracic epidural technique not only provided hemodynamic stability, decreased the incidence of post op nausea and vomiting but also significantly enhanced intraoperative and postoperative analgesia compared to general anesthesia group and improved overall satisfaction for patients undergoing modifying radical mastectomy.

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