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RESEARCH ARTICLE

COMPARISON OF POSTOPERATIVE ANALGESIC EFFICACY AND HAEMODYNAMIC STABILITY OF THORACIC EPIDURAL BLOCK VERSUS THORACIC PARAVERTEBRAL BLOCK USING CONTINUOUS INFUSION OF BUPIVACAINE IN PATIENTS UNDERGOING ELECTIVE MODIFIED RADICAL MASTECTOMY.

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Keywords:-

Thoracic epidural block, Thoracic paravertebral block, Breast Surgery, Visual analog scale, Rescue analgesic.

Abstract

Introduction : Breast cancer is one of the most common cancers in women, requiring frequent surgical intervention. Adequate pain relief with parenteral and regional anaesthesia techniques improves respiratory outcome and decreases postoperative complications.

Aim: To compare the postoperative analgesic efficacy and safety profile of thoracic epidural and thoracic paravertebral block using continuous infusion of bupivacaine in patients undergoing elective modified radical mastectomy.

Materials and methods: A prospective randomized double-blinded study was conducted in 60 patients undergoing modified radical mastectomy under general anesthesia. 30 patients in Group P received paravertebral block at T6-T7 level and 4 cm of catheter was directed cephalad, 30 patients in group E received epidural block at T6-T7 level and 4 cm of catheter was directed cephalad. After extubation, the 0.125% bupivacaine infusion started, postoperative pain VAS score, haemodynamics and need for rescue analgesics observed and recorded.

Results: The statistical analysis showed that better hemodynamic stability was maintained in group P. However, in both the group P and group E postoperative analgesic efficacy was equally comparable.

Conclusion: This study concludes that both thoracic epidural and thoracic paravertebral block provide comparable post operative analgesia in patients undergoing elective major breast surgery.

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Introduction:-

Breast cancer is one of the most common cancers in women. Requires frequent surgical intervention¹. Incidence of significant acute post operative pain – 40%². Incidence of chronic post operative pain – 50%³. Inadequate pain relief results in decreased respiratory effort, impaired lung function, atelectasis, hypoxemia and pulmonary

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infection. Epidural block is considered the gold standard for pain relief in breast surgeries. Complications – Hypotension, Bradycardia, Urine retention, Total Spinal Anesthesia, Paraplegia. Paravertebral block is a safe, effective, technically simple with fewer side effects.

Aim:-

The aim of this study is to compare the postoperative analgesic efficacy and haemodynamic stability of thoracic epidural and thoracic paravertebral block using a continuous infusion of 0.125% bupivacaine in patients undergoing elective modified radical mastectomy.

Observed parameters:-

Post operative visual analogue score, Post operative hemodynamics, Incidence of complications and Need for rescue analgesic.

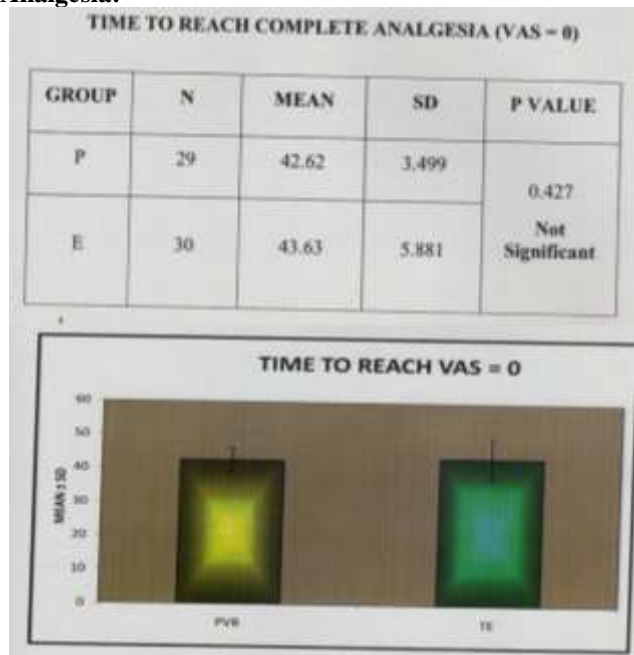
Materials and Methods:-

This Prospective, randomized, double blinded study was done at General surgery operating theatre, Department of Anaesthesiology, Madras Medical College. After approval of the study from our institutional ethics committee the study was conducted in 60 patients undergoing modified radical mastectomy under general anesthesia. Age: 18 to 60 years, Weight: 35 to 65 kg, Height: 145 to 170 cm, Informed consent was obtained. All patients thoroughly examined and assessed pre-operatively. Visual analogue score was explained. 60 patients were randomly allocated into 2 groups (Groups P & E). After shifting to OT and connecting the monitors and recording baseline vital parameters, the patients received the neuraxial block.

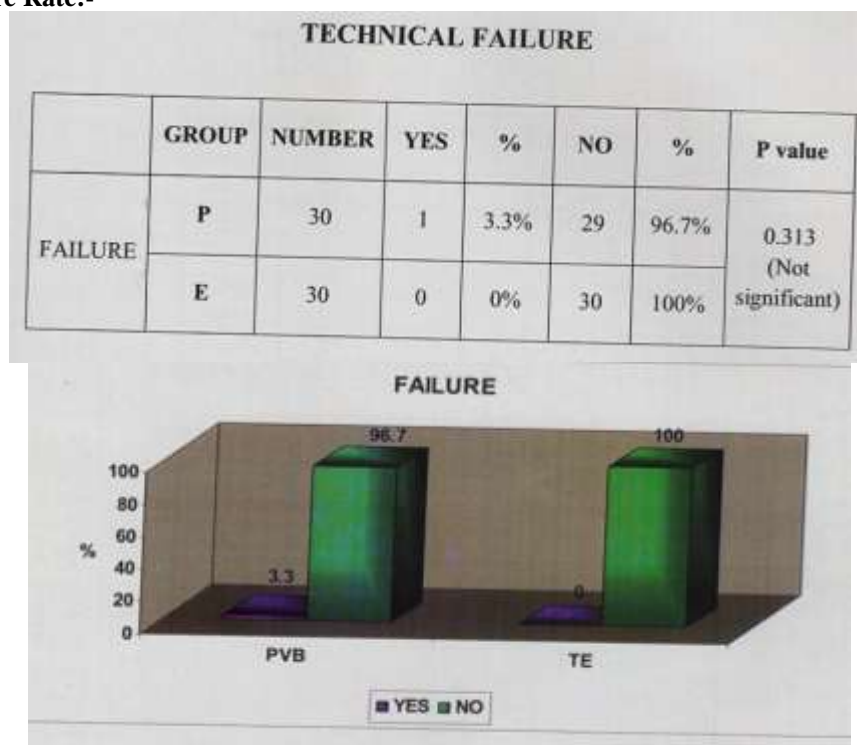
1. 30 patients in Group P received paravertebral block at T6-T7 level and 4 cm of catheter was directed cephalad
2. 30 patients in group E received epidural block at T6-T7 level and 4 cm of catheter was directed cephalad
3. Test dose of 3 ml of 2% Lignocaine with adrenaline was given through the epidural catheter
4. General anesthesia was induced and maintained for the surgery. After the surgery was over, patients were reversed and extubated. At this time, the patient's pulse rate, systemic blood pressure, Visual analogue score were recorded as baseline values. In group E, 8ml of 0.25% Bupivacaine was injected as bolus as thoracic epidural. In group P, 8 ml of 0.25% Bupivacaine was injected as bolus as thoracic paravertebral block. Postoperative VAS score, haemodynamics recorded.
5. Procedure was considered a failure if there was unsatisfactory post operative analgesia with VAS score more than 4 after 20 min of giving the bolus dose
6. A continuous infusion of 0.125 % bupivacaine was started at 6ml per hour one hour after the bolus, using a syringe infusion pump
7. Time to reach complete analgesia was defined as the time duration at which the patient's visual analogue score becomes zero
8. Rescue analgesic was given at any time when VAS was more than 4 at any point of time after 20 min of activating infusion. Analgesic given was 1mcg/kg of Fentanyl iv followed by paracetamol infusion 15mg/kg iv
9. Hypotension was defined as 20% fall in mean arterial pressure from the baseline

Observation And Analysis:-

Results were expressed as mean and standard deviation. All statistical analysis was carried out using SPSS for windows version 15.0. The t- test was used for comparison of quantitative variants. Qualitative variants were compared using the chi square test or Fischer's exact test. A p value of less than 0.05 was considered statistically significant.

Time To Reach Complete Analgesia:-

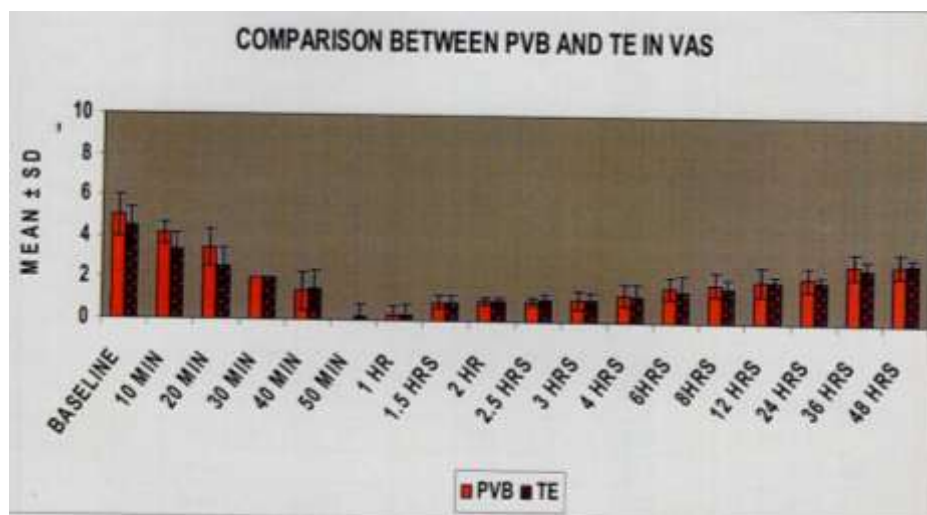
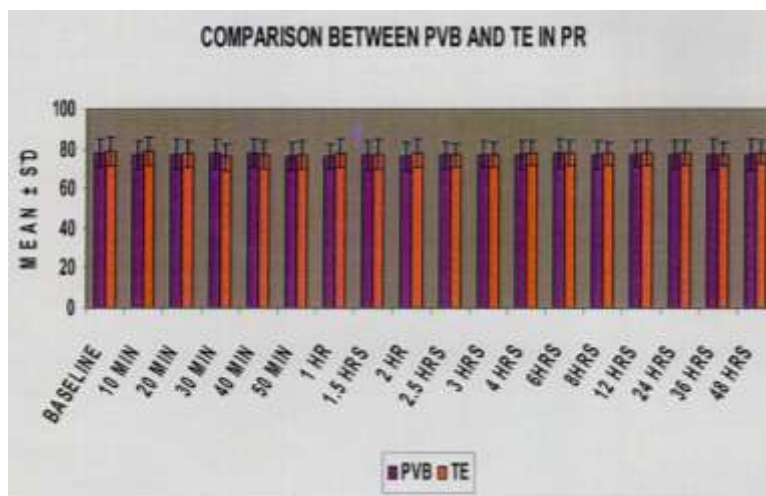
1. In group P, the mean time to reach pain score zero is 42.62 minutes and in group E it was 43.63 minutes
2. This data is not significant by student's t test

Technical Failure Rate:-

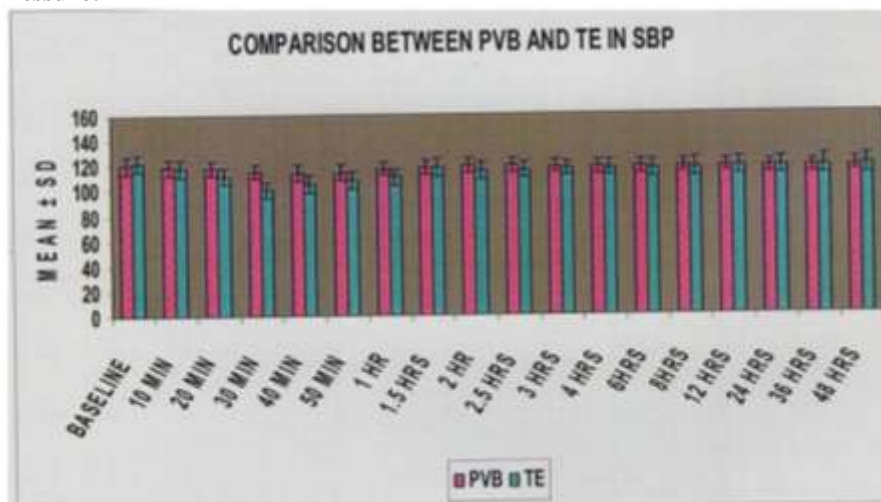
The overall failure rate in group P was 3.3% (one patient) and in group E it was zero percentage. Statistically not significant

Visual Analogue Score:-

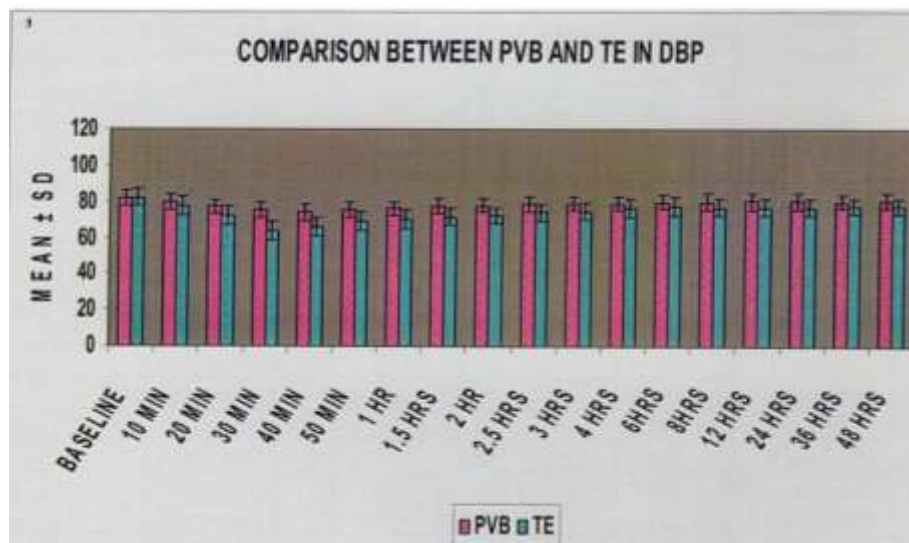
1. The P values of VAS Score were statistically significant till 20 min.
2. After which they become statistically insignificant.
3. This means that both epidural and paravertebral block are comparable in terms of VAS

**Pulse Rate:-**

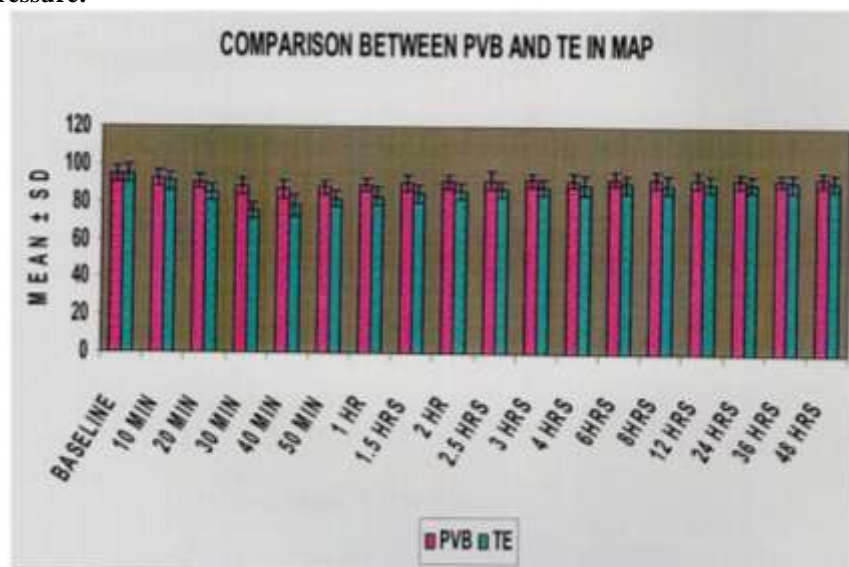
The P value was more than 0.05 at all times and hence statistically insignificant .
Both the groups were comparable in terms of pulse rate

Systolic Blood Pressure:-

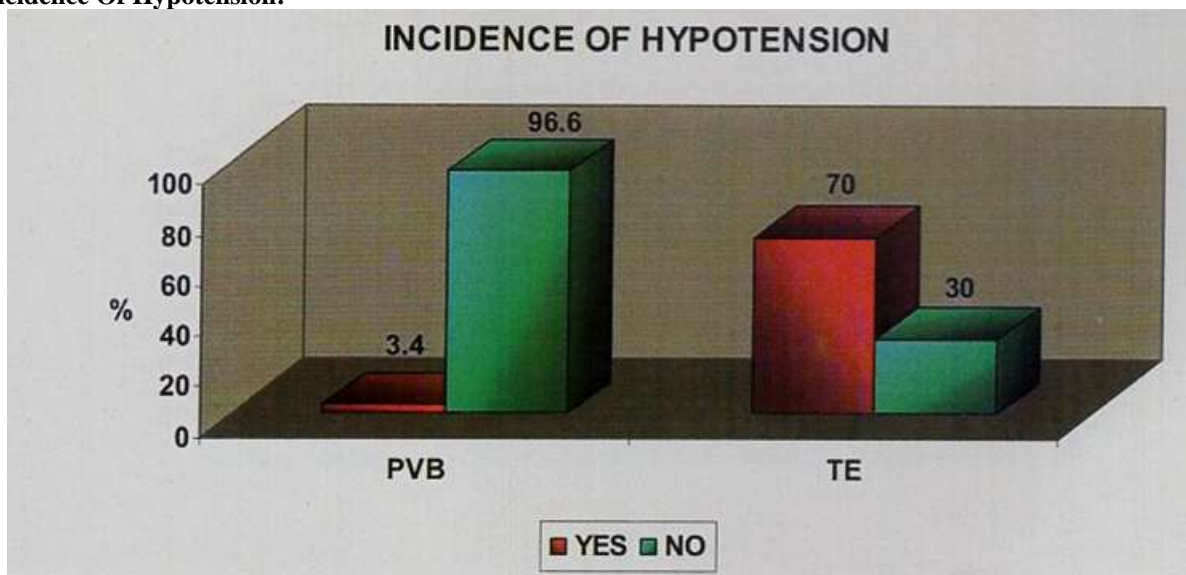
1. The mean systolic blood pressure between the groups was statistically significant between 20 min and 2.5 hours.
2. The decrease in SBP was noticed in the epidural group
3. Maximal decrease in systolic blood pressure was observed at 30 min after epidural block

Diastolic Blood Pressure:-

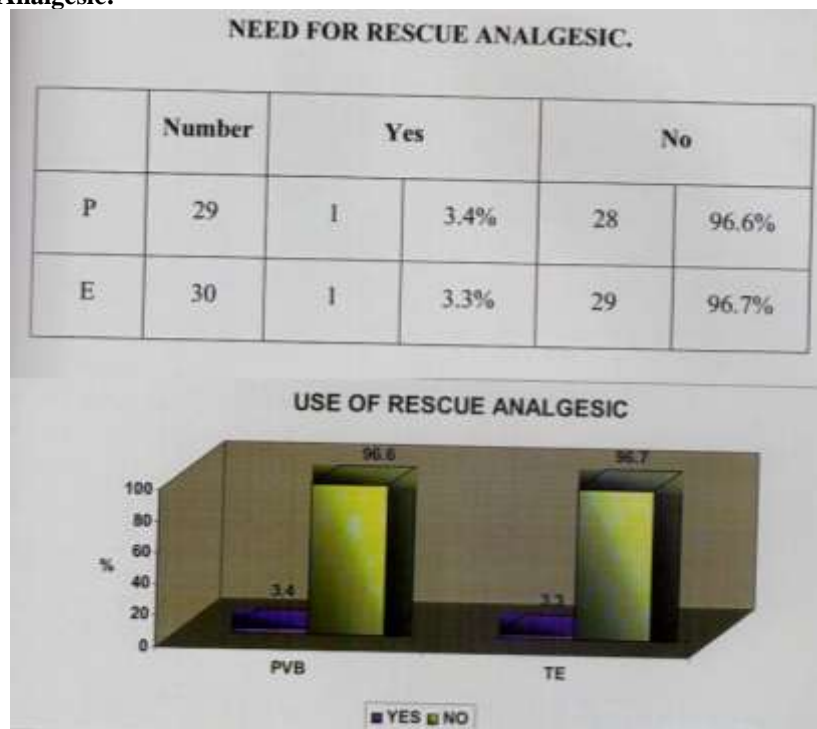
1. The difference in mean diastolic pressure between the two groups was statistically significant from 20 min and thereafter .
2. Hence there is a significant decrease in diastolic blood pressure with epidural block compared to paravertebral block.
3. Maximum decrease was seen 30 min after the block

Mean Arterial Pressure:-

1. The difference in mean arterial pressure between the two groups was statistically significant from 20 min upto 24 hours
2. Maximal decrease in blood pressure was observed 30 min after the block
3. There is a significant fall in mean arterial pressure with epidural block compared to paravertebral block

Incidence Of Hypotension:-

1. 21 patients out of 30 patients (70%) who received thoracic epidural had clinically significant hypotension.
2. This was in comparison to paravertebral block where only 1 out of 29 patients had hypotension (3.4%)

Need For Rescue Analgesic:-

One out of 30 patients receiving epidural and one out of 29 patients receiving paravertebral block received rescue analgesic

Discussion:-

1. The effective bupivacaine concentration for post surgical pain relief was found to be 0.125% to 0.375% by Conacher I.D et al and Ross I.D. et al. Hence we used 0.25% Bupivacaine was used for this study and followed by 0.125% bupivacaine for continuous infusion
2. In our study the time taken to reach pain score zero was 42.62 ± 3.49 min in group P and 43.63 ± 5.88 min in group E. Hence onset of analgesia is almost the same in both the groups. This is similar to a study done by Santosh et al
3. In our study there was no significant change with respect to pulse rate between both the groups. This is similar to the results obtained by P.J.Mathews and Conacher et al .
4. SBP,DBP, MAP were measured in both groups. Group E showed maximum reduction in MAP at 30 minutes after injection of bolus local anaesthetic. This co relates with similar study done by Santosh et al who noted maximum blood pressure drop with epidural group 20-30 min after bolus injection
5. VAS in our study did not show any statistical significance between the two groups. This was similar to study done by Mathews et al and K.Pertunnen et al who showed comparable segmental analgesia in both the groups.
6. The overall technical failure rate was zero percentage in group E and 3.3% in group P . However Lonnqvist in his study reported a failure rate of 10% in Paravertebral group . Santosh et al reported 8% failure rate in paravertebral group and 20% in epidural group
7. In our study the incidence of hypotension in group E was 70% and that in group P was 3.44% . It was 50% in epidural group and 8.6% in paravertebral group in the study done by Santosh et al

Conclusion:-

This study concluded that both thoracic epidural and thoracic paravertebral block provide comparable post operative analgesia in patients undergoing elective major breast surgery. However, better hemodynamic stability was maintained with thoracic paravertebral group.

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