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Comparative study between Ultrasound guided Pectoral nerves block and Thoracic epidural as analgesia in breast surgeries

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ABSTRACT

Background: Breast surgery is an exceedingly common procedure and associated with an increased incidence of acute and chronic pain. These procedures cause significant acute pain and may progress to chronic pain states in 25–60% of cases. Regional anesthesia techniques may improve postoperative analgesia for patients undergoing breast surgery. Acute postoperative pain due to insufficient or ineffective pain control is a major risk factor for the development of chronic pain after breast surgery. This condition includes paresthesia, intercostobrachial neuralgia and phantom breast pain.

Aim of the Work: we aimed at comparing the analgesic effectiveness and safety of pectoral (Pecs) block versus thoracic epidural in breast surgeries.

Material and Methods: The present study was conducted to compare the efficacy and safety of the Pecs II block with thoracic epidural (TE) on sixty female patients ASA I-II, their ages ranged from 18- 65 years old scheduled for unilateral breast surgery. The patients were allocated randomly into two groups (n=30) according to type of regional anesthesia administrated. (Pecs block or TE).

Results: The results of the present study demonstrated that, Pecs block caused hemodynamic stability, decreased the intensity of post-operative pain, reduced post-operative analgesic requirement, prolonged the time needed for first request of analgesia, decreased PONV. Therefore it can be considered as quite safe procedure and effective as well for intraoperative and postoperative pain control in breast surgeries.

Conclusion: Whether it is more superior to thoracic epidural depends on the type and extent of surgery. For surgeries involving the axilla, Pecs block is required as part of axillary compartment block but for medial breast incisions, thoracic epidural offers denervation of anterior branches of the intercostal nerves, which Pecs block does not confer.

Keywords: Pecs, thoracic epidural, breast surgeries

INTRODUCTION

Breast Surgery is becoming more and more common. Patients are often middle-aged women and with high public awareness around issues of breast cancer. The numbers are increasing. Breast surgery is an exceedingly common procedure and associated with an increased incidence of acute and chronic pain. Regional anesthesia techniques may improve post-operative analgesia for patients undergoing breast surgery [1]. Postoperative pain for surgeries involving chest wall is mostly managed using multimodal analgesia i.e. by using combination of non-steroidal anti-inflammatory drugs (NSAIDS), paracetamol, opioids and local anesthetic infiltration. In extensive surgeries like radical mastectomy and latissimus dorsi flaps, some anesthetists may employ the use of paravertebral blocks or thoracic epidural analgesia or pectoral nerves block. Every year, thousands of patients undergo surgery in the region of the breast and axilla. These procedures cause significant acute pain and may progress to chronic pain states in 25–60% of cases[2]. The pectoral nerves block (Pecs block) is an easy and reliable superficial block. Once the pectoralis muscles are located under the clavicle the space between the two muscles is dissected to reach the lateral pectoral and the medial pectoral nerves. The main indications are breast expanders and subpectoral prosthesis where the distension of these muscles is extremely painful[3]. A second version of the Pecs block is called ‘‘modified Pecs block’’ or Pecs block type II. This novel approach aims to block at least the pectoral nerves, the intercostobrachial, intercostals III-IV-V-VI and the long thoracic nerve. These nerves need to be blocked to provide complete analgesia during breast surgery[3]. Epidural anesthesia represents one of the central neuroaxial block techniques. Improvements in equipment, drugs and technique made its popularity and introduced it as a versatile anesthetic technique with many applications in surgery and pain control. Satisfactory post-operative analgesia prevents unnecessary patient discomfort. It may play a role in decreasing morbidity, postoperative hospital stay and thus the cost[4] . Inadequate postoperative analgesia has harmful physiologic and psychological consequences that increase morbidity and mortality which subsequently delay recovery and the return to daily living[5].

AIM OF THE WORK

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In this prospective randomized study we aimed at comparing the analgesic effectiveness of thoracic epidural versus Pecs block in breast surgeries.

PATIENTS AND METHODS

This is a prospective randomized clinical study that done in Alazhar University Hospitals after approval from Institutional Ethics Committee. An informed written consent obtained from every patient. Any unexpected risks appeared during the course of the research will be cleared to participants and Ethical Committee on time and proper measures will be taken to overcome or minimize these risks. This study conducted on 60 adult patients scheduled for elective breast surgeries. They were randomly allocated into two equal groups; 30 patients each. Both groups received general anesthesia (G.A.) after the technique by; propofol 2 mg/kg, atracurium 0.5 mg/kg and fentanyl 2 ug/kg for induction and isoflurane 0.8-1.2 % (1 MAC) in 100% O2 for maintenance of anesthesia. Group I (PECS) [No = 30] they received Pecs block II guided by ultrasound. An in-plane technique used with needle direction from proximal and medial, to distal and lateral in an oblique manner at dermatome level T2-T3. The skin point of puncture is infiltrated with 2% lidocaine and once the structures are identified with ultrasound we proceed to inject 20 ml of 0.25% bupivacaine under pectoralis minor muscle above the serratus muscle and 10 ml between the pectoral muscles. Group II (TE) [No = 30] they received thoracic epidural at the level T6- T7 space the catheter advanced for 3-5 centimeters upwards into the epidural space. Epidural analgesia was intraoperatively by a regimen consisting of mixture of bupivacaine 0.125% and fentanyl 4ug/ml; 10-15 ml as a bolus dose before general anesthesia. ***Inclusion Criteria:*** Female patient 18-65 years old. ASA class I and II patient. Patients undergoing elective breast surgeries. ***Exclusion Criteria:*** Declining to give written informed consent. History of allergy to the medications used in the study. Contraindications to regional anesthesia (including coagulopathy and local infection). Prior breast surgery except for diagnostic biopsies. ***Statistical analysis:*** Recorded data were analyzed using the statistical package for social sciences, version 20.0 (SPSS Inc., Chicago, Illinois, USA). Quantitative data were expressed as mean ± standard deviation (SD). Qualitative data were expressed as frequency and percentage. ***The following tests were done:*** Independent-samples t-test of significance was used when comparing between two means. Mann Whitney U test: for two-group comparisons in non-parametric data. Chi-square (x2) test of significance was used in order to compare proportions between two qualitative parameters. The confidence interval was set to 95% and the margin of error accepted was set to 5%. So, the p-value was considered significant as the following: Probability (P-value). P-value <0.05 was considered significant. P-value <0.001 was considered as highly significant. P-value >0.05 was considered insignificant.

RESULTS

Table (1): Comparison between groups according to heart rate.

Heart rate	Group I: PECS (N=30)	Group II: TE (N=30)	t-test	p-value
Baseline				
Mean ± SD	70.93 ± 6.05	70.87 ± 5.37	0.002	0.964
Range	60-81	60-79		
After block				
Mean ± SD	70.80 ± 5.56	70.23 ± 6.25	0.138	0.001
Range	59-84	59-84		
After induction				
Mean ± SD	70.93 ± 5.04	70.77 ± 4.95	0.017	0.001
Range	61-83	61-83		
15min. after block				
Mean ± SD	71.77 ± 4.64	71.37 ± 4.66	0.111	0.001
Range	63-80	63-80		
1hr after block				
Mean ± SD	71.40 ± 3.58	71.40 ± 3.74	0.291	0.001
Range	66-79	66-79		
End of surgery				
Mean ± SD	72.10 ± 3.41	71.67 ± 3.66	0.225	0.637
Range	65-81	65-81		
PACU				
Mean ± SD	71.73 ± 3.81	71.30 ± 4.11	0.179	0.673
Range	64-79	63-79		
4hrs postoperative				
Mean ± SD	71.03 ± 3.82	71.03 ± 4.60	0.163	0.782
Range	63-79	60-79		

8hrs postoperative				
Mean ± SD	71.30 ± 4.00	71.07 ± 4.62	0.044	0.835
Range	63-78	60-77		

t- Independent Sample t-test; p-value >0.05 NS

This table shows statistically significant difference between groups according to HR from after block to 1hr after block.

Table (2): Comparison between groups according to MAP.

MAP	Group I: PECS (N=30)	Group II: TE (N=30)	t-test	p-value
Baseline				
Mean ± SD	89.10 ± 3.78	89.90 ± 3.74	0.678	0.414
Range	80-96	80-96		
After block				
Mean ± SD	85.23 ± 3.97	74.90 ± 6.38	56.711	<0.001**
Range	73-91	65-85		
After induction				
Mean ± SD	84.60 ± 3.89	75.10 ± 6.23	50.206	<0.001**
Range	72-90	63-85		
15min. after block				
Mean ± SD	86.10 ± 3.83	77.50 ± 6.54	38.618	<0.001**
Range	74-92	67-90		
1hr after block				
Mean ± SD	87.10 ± 3.90	77.50 ± 6.54	47.663	<0.001**
Range	75-93	67-90		
End of surgery				
Mean ± SD	87.40 ± 3.97	85.13 ± 3.53	3.460	0.123
Range	75-93	74-90		
PACU				
Mean ± SD	87.10 ± 3.76	82.40 ± 4.92	1.284	0.107
Range	76-94	72-90		
4hrs postoperative				
Mean ± SD	87.30 ± 3.75	85.60 ± 3.92	2.946	0.091
Range	76-94	75-94		
8hrs postoperative				
Mean ± SD	89.10 ± 3.69	89.90 ± 3.74	0.695	0.408
Range	80-96	80-96		

t- Independent Sample t-test
P-value >0.05 NS; **p-value <0.001 HS

This table shows statistically significant difference between groups according to MAP from after block to 1hr after block.

Table (3): Comparison between groups according to VAS.

VAS	Group I: PECS (N=30)	Group II: TE (N=30)	z-test	p-value
PACU				
Mean ± SD	1 (1)	1 (1)	-0.087	0.931
Range	0-1	0-2		
2hrs postoperative				
Mean ± SD	1 (2)	2 (1)	-3.374	0.011*
Range	0-2	0-2		
4hrs postoperative				
Mean ± SD	2 (1)	3 (2)	-3.901	<0.001**
Range	0-4	1-4		
6hrs postoperative				
Mean ± SD	2.5 (2)	3 (2)	-2.371	0.018*
Range	1-4	1-4		
8hrs postoperative				
Mean ± SD	2 (0.3)	3 (1)	-4.400	<0.001**
Range	0-3	1-3		

This table shows statistically significant difference between groups according to VAS from 2hrs postoperative to 8hrs postoperative.

Table (4): Comparison between groups according to PONV.

PONV	Group I: PECS (N=30)	Group II: TE (N=30)	x2	p-value
PACU				
No nausea or Vomiting	28 (93.3%)	19 (63.3%)	4.297	0.097
Mild nausea	1 (3.3%)	6 (20.0%)		
Sever nausea	1 (3.3%)	3 (10.0%)		
Vomiting once	0 (0.0%)	2 (6.7%)		
2hrs postoperative				
No nausea or Vomiting	28 (93.3%)	20 (66.7%)	10.667	0.014*
Mild nausea	0 (0.0%)	8 (26.7%)		
Sever nausea	0 (0.0%)	1 (3.3%)		
Vomiting once	2 (6.7%)	1 (3.3%)		
4hrs postoperative				
No nausea or Vomiting	29 (96.7%)	22 (73.3%)	6.405	0.011*
Mild nausea	1 (3.3%)	8 (26.7%)		
Sever nausea	0 (0.0%)	0 (0.0%)		
Vomiting once	0 (0.0%)	0 (0.0%)		
6hrs postoperative				
No nausea or Vomiting	28 (93.3%)	23 (76.7%)	5.218	0.040*
Mild nausea	2 (6.7%)	7 (23.3%)		
Sever nausea	0 (0.0%)	0 (0.0%)		
Vomiting once	0 (0.0%)	0 (0.0%)		
8hrs postoperative				
No nausea or Vomiting	30 (100.0%)	30 (100.0%)	0.000	1.000
Mild nausea	0 (0.0%)	0 (0.0%)		
Sever nausea	0 (0.0%)	0 (0.0%)		
Vomiting once	0 (0.0%)	0 (0.0%)		

x2 Chi-square test
p-value >0.05 NS; *p-value <0.05 S

This table shows statistically significant difference between groups according to PONV from 2hrs postoperative to 6hrs postoperative.

Table (5): Comparison between groups according to Pethidine rescue.

Pethidine rescue	Group I: PECS (N=30)	Group II: TE (N=30)	x2	p-value
No	25 (83.3%)	20 (66.7%)	5.221	0.034*
Yes 50	5 (16.7%)	10 (33.3%)		

x^2 Chi-square test
*p-value <0.05 S

Table (6): Comparison between groups according to surgeon satisfaction.

Surgeon satisfaction	Group I: PECS (N=30)	Group II: TE (N=30)	x2	p-value
Fair	5 (16.7%)	14 (46.7%)	19.189	<0.001**
Good	11 (36.7%)	16 (53.3%)		
Very good	7 (23.3%)	0 (0.0%)		
Excellent	7 (23.3%)	0 (0.0%)		

This table shows highly statistically significant difference between groups according to surgeon satisfaction.

Table (7): Time to the first request for analgesia and total dose of analgesia in the first 24 hours in the three groups.

	TE Group	Pecs Group	One Way ANOVA	
			F	P-value
Time to first need analgesia (min)	253.33 ± 93.59	473.75 ± 99.61	5.860	0.032*

It was significantly prolonged in Pecs group (P-value< 0.05).

Table (8): Comparison between groups according to total Fentanyl consumption.

Total Fentanyl consumption	Group I: PECS (N=30)	Group II: TE (N=30)	t-test	p-value
Mean±SD	115.50±17.24	145.00±17.27	43.846	<0.001**
Range	100-150	110-175		

t- Independent Sample t-test
**p-value <0.001 HS

This table shows highly statistically significant difference between groups according to total Fentanyl Consumption.

As regards hemodynamic measurements (HR and MAP): The results of the current study showed that there was no statistically significant difference found between the two studied groups at baseline values (P-value > 0.05), while there was highly statistically significant decrease from after block to 1hr after block in TE group compared to Pecs group (P-value < 0.01). As regards intergroup hemodynamic changes, we found statistically significant decrease in TE in HR and MAP, while there was no significant hemodynamic difference reported in Pecs group (P-value> 0.05). This hemodynamic response is duo to bilateral sympathetic blockade observed in TE group. As the Pecs blocks are peripheral nerve blocks, they do not result in sympathectomy so no hemodynamic affection. These differences might explain the significance in the incidence of hypotension and bradycardia between the 2 groups as shown in tables (1 and 2). **In the present study**, **the efficacy of the Pecs II block and TE for analgesic consumption were investigated:** The results showed that the mean consumption of intraoperative fentanyl in Pecs group was highly significantly lower (115.50 ± 17.24 ug/kg) in comparison with TE (145.0 ± 17.27 ug/kg) (**p-value** <0.001) Only 5 of 30 patients in Pecs group and 10 of 30 patients in TE required pethidine, where an adequate VAS score of less than 4 was maintained only by non-steroidal anti-inflammatory drugs in form of Tenoxicam (Epicotil) 8mg intravenous just after transferring to ward for all patients. Additionally, we found that there was a significant prolongation in duration of postoperative analgesia in the patients receiving the Pecs II block. The mean duration was (473.75 ± 99.61) min in Pecs group and (253.33 ± 93.59) min in TE. Therefore; Pecs block may be more efficient after surgery with axillary dissection. **In present study, pain scores assessed by VAS and the results showed that,** patients with Pecs block were experienced less intense pain in immediate, at 4hr and 6hr post-operative than TE group with highly statistically significant decrease of VAS in immediate and at 2 hr post-operative as shown in table (3). **Regarding postoperative nausea and vomiting, (PONV**), this study showed that 4 patients in TE group (20%) and only 2 patients in Pecs group (10%) as shown in table (4). PONV was treated with 10 mg metoclopramide and ondansetron 4 mg.

DISCUSSION

Opioids, are a good option to control postsurgical pain however, these drugs while having a proven analgesic efficacy are characterized by many side effects such as nausea, vomiting, pruritus, sedation, respiratory depression, delayed channeling, hypotension, urinary retention,

as well as immunosuppressive effects and recently pro-metastatic rule [6]. Although GA is the conventional technique used for oncologic breast surgeries produce the desired state of unconsciousness, it does not eliminate the surgical stress response. it may aggravate immunosuppression and may cause undesirable side effects such as post-operative pain, nausea and vomiting after surgery [7]. Thoracic epidural analgesia is the gold standard technique after breast surgery but the adequacy of thoracic and axillary blockade during lymph node dissection is still a problem [8]. On the other hand, attributed to the recent application of US in anesthetic practice, Pecs is a novel interfascial plane block have been described recently [9], which aims to block the lateral and medial pectoral, the intercostobrachial, the intercostals II and VI, and the long thoracic nerves. These nerves need to be blocked to provide complete analgesia during breast surgery [10]. The effectiveness based on our understanding that the brachial plexus nerves are the main component of this painful surgery [11]. The present study was conducted to compare the efficacy and safety of the Pecs II block with TE for postoperative analgesia, hemodynamic effects and complications in patients undergoing unilateral breast surgery. **As regards hemodynamic measurements (HR and MAP):** Intergroup hemodynamic changes showed statistically significant decrease in HR and MAP in the TE group, while there was no significant hemodynamic difference reported in Pecs group (P-value> 0.05). In agreement with the results of the current study, ***Soni et al.*** [8] compared thoracic paravertebral and epidural in patients undergoing breast surgery using single shots of 0.5% ropivacaine. They found significant change in MAP of patient receiving epidural anesthesia at 10 min, 20 min, 30 min, 40 min, 50 min, 1hr, 1 hr PO (p-value < 0.05). They explained their finding as that the cardiac sympathetic fibers (T1 to T4) are blocked which may cause decrease in cardiac contractility. In addition, increased central venous pressure, splanchnic nerve blockade with blockade of medullary secretion of catecholamines, dilation of the capacitance vessels of the lower limbs may also occur and the cardiovascular reflexes responding to low cardiac output states are abolished. This can lead to profound hypotension and bradycardia. In addition, in agreement with the results of the current study, studies done by ***Bashandy and Abbas*** [12] who performed randomized study on 120 patients allocated to receive either GA plus Pecs block or GA alone. Also, ***Blancoa et al.*** [11] who performed the Pecs II block in 50 patients undergoing modified radical mastectomies, they reported that there was no change in hemodynamics with the Pecs block because there is no sympathetic block was associated with it as that is associated to paravertebral and epidural blockades. Also, ***ELdeen*** [13] compared Pecs block with thoracic spinal at the T5 in breast cancer surgery. He reported that there was no change with Pecs block in HR and MAP as it was away from sympathetic supply of breast and chest area whereas the thoracic spinal blocks bilateral sympathetic supply to breast and chest area, and the extent of the spread of the drugs is greater. These differences might explain the significance in the incidence of hypotension and bradycardia between the 2 groups. **On the other hand,** in disagreement with our study ***Lahiry et al.*** [14] and ***Rajan et al.*** [15] they found that there was no statistically significant difference in the hemodynamic parameters of thoracic epidural when compared to GA in MRM patients. This might be duo to selective sympathectomy in TE and the potential to dilate the constricted coronary vessels and reduction of the cardiac workload as well as optimization of the myocardial oxygen delivery, which have a positive impact on the cardiovascular status. **In the present study**, **the efficacy of the Pecs II block and TE for analgesic consumption were investigated and the results showed that,** the mean consumption of intraoperative fentanyl in Pecs group was highly significant lower (115.50 ± 17.24) ug in comparison to TE(145.0 ± 17.27) ug (**p-value** <0.001). Also, in Pecs group reduced total amount of analgesic (pethidine) requirement during the first 8 hours postoperative. Only 5 of 30 patients in Pecs group and 10 of 30 patients in TE required pethidine, where an adequate VAS score of less than 4 was maintained only by non-steroidal anti-inflammatory drugs in form of Tenoxicam (Epicotil) 8mg intravenous just after transferring to ward for all patients. Additionally, we found that there was a significant prolongation in duration of postoperative analgesia in the patients receiving the Pecs II block. The mean duration was (473.75 ± 99.61) min in Pecs group and (253.33 ± 93.59) min in TE. Therefore; Pecs block may be more efficient

after surgery with axillary dissection. In the same line with our results, the study of ***Bashandy and Abbas*** [12] who studied Pecs block vs GA in breast cancer surgery using 0.25% bupivacaine, they found that the mean intraoperative fentanyl consumption was significantly lower in the Pecs group than in the GA group. In addition, the total amount of postoperative morphine was significantly lower in the Pecs group than in the GA group. They reported that the Pecs block is a combination of motor and sensory nerve blocks that produced excellent analgesia when combined with GA for breast surgery with axillary dissection. ***El-Sheikh et al.*** [16] who studied TPVB versus Pecs block for analgesia after breast surgery, also reported that the mean intraoperative fentanyl consumption was significantly lower in Pecs group rather than paravertebral, and the mean time for first request of morphine was prolonged in Pecs group than in TPVB group. Also, ***Yuki et al.*** [17] who studied Pecs block vs GA in breast cancer surgery using 0.25% levobupivacaine found that the mean fentanyl consumption was significantly lower in the Pecs group than in the GA group and the amount of additional postoperative analgesic within 24hr used in Pecs were significantly lower. Our results are in accordance with a study done by ***Soni et al.*** [8] in breast surgery compared between paravertebral and epidural, which showed similar analgesic profile of both the regional techniques. They found non-significant difference in the mean requirement of fentanyl in Epidural group and in Paravertebral group. Also, non-significant difference in the meantime of rescue analgesic for epidural group and in paravertebral group. On the other hand, the result were in disagreement with ***Kulhari et al.*** [10] who studied pectoral nerve block versus thoracic paravertebral block for postoperative analgesia after radical mastectomy and none of the patients required additional fentanyl during the intraoperative period. They found that the use of nitrous oxide 60% in oxygen and higher concentration of ropivacaine 0.5% in Pecs and at T3 in PV groups and the sensory block spread to T2, may result in better intraoperative analgesia and hemodynamic stability and no need to additional fentanyl. Moreover, in disagreementwith our results, the study of ***Hetta*** **and** ***Rezk*** [18] who compared Pecs II block versus TPVB for unilateral radical mastectomy with axillary evacuation using single shots of bupivacaine 0.25%. They reported that posto-perative morphine consumed at 24 h was significantly lower in TPVB group (12 mg versus 20 mg) in Pecs group and time to first request for morphine was 11 hours (9-13 hours) in the TPVB group compared to 6 hours (5-7 hours) in the Pecs group, (P value < 0.001). They explained their result by that deposition of LAs in pectoralis-serratus interfascial plane blocked the lateral cutaneous branches of intercostal nerves (T2-T4) but did not spread anteriorly to block the anterior cutaneous branches that supply the parasternal part of breast region. In addition, the relatively large vascular space allowed rapid clearance of LAs resulting in shorter duration of analgesia and more postoperative opioid consumption. This difference with our findings might be due to the difference in the study design. The authors believed that blocking the PNs is beneficial only for procedures that involve stretching of pectoralis muscles, such as subpectoral prostheses. Therefore, they injected the whole amount of LAs in the fascial plane between Pmm and Sam. Thus, they did not block the pectoral nerves. **In present study, pain scores assessed by VAS and the results showed that,** the TE produced a dense block of the T2-T6 spinal nerves and the intercostal nerves and all lateral and anterior cutaneous branches. However, it did not anesthetize the LPN (C 5-C 7), the MPN(C 8-T1), the long thoracic nerve (C 5-C 7) or the thoracodorsal nerves (C 6- C 8), that are covered by the Pecs I and Pecs II block, leading to inadequate analgesia. This explained why patients with TE having radical mastectomy were frequently complaining of pain in the axilla and upper limb. In contrast, the Pecs block lead to better pain relief. Supporting to our results, ***Kulhari et al.*** [10] studied Pecs block versus TPVB for postoperative analgesia after radical mastectomy. They reported that pain scores were lower in patients receiving the Pecs II block in the immediate post-operative period for 2 h after surgery compared to the TVPB group [median, 2 (2–2.5) vs 4 (3–4) in the Pecs II and TPVB group, respectively (P<0.0001). Similar results were observed by ***Wahba et al.*** [9] who compared TPVB with Pecs in breast cancer surgery, they concluded that pain scores were significantly lower in Pecs group in first 12h postoperative (P<0.001) and pain intensity was higher in the next 12 h in comparison with PVB group (probably because of the effect of

local anesthetic). ***ELdeen*** [13] found that VAS were significantly decreased in Pecs group throughout surgery and first 24 h post-operative when compared to thoracic spinal in breast surgery. Also, ***Bashandy and Abbas*** [12] and ***Yuki et al.*** [17] studied Pecs block versus GA in breast cancer surgery and they observed significant lower VAS pain scores in the Pecs group at all post-operative periods. On the other hand, ***Hetta*** **and** ***Rezk*** [18] found that on comparing Pecs with TPVB the intensity of pain at rest and movement was low in both groups in VAS 0, 2, and 4 hours postoperatively, and no significant differences were observed. However, there was significant reduction in the median VAS at rest and movement in group TPVB compared to group Pecs at 8, 16 and at 24 hours. This was explained by that authors injected the LAs in three levels in PVB group at T2, T4, T6 in the area supplied by intercostal nerves from T1 to T7, including the axilla, which was anesthetized in all patient. In group Pecs, injected the whole amount of LAs in the fascial plane between Pmm and SAm, they did not block the pectoral nerves therefore the axilla did not anesthetize in 12 patients, and the block did not cover dermatomal area of T6 and dermatomes below it in 9 patients. **In regard to side effects,** In the present study, no block-related complications in the two studied groups were recorded such as pneumothorax, vascular puncture, or local anesthetic toxicity. **Regarding hypotension (MAP<20% of preo-perative value) and bradycardia (heart rate <50 b/min),** the results of the current study showed that there were significant decrease in the incidence of hypotension and bradycardia in Pecs group than TE. This might have been derived from absence of sympathetic block with Pecs block. In the present study, hypotension occurred in 10 patients in TE group (33.3%) and no one in Pecs group. The decrease in MAP was treated with IV fluid and ephedrine 6 mg in incremental dose. On the other hand, there were 6 patients (20%) in TE developed bradycardia and non in Pecs group. The decrease in heart rate was managed by atropine IV (0.01mg/kg). This incidence of hypotension and bradycardia were correlated with bilateral sympathetic block in epidural group. In addition, induction of anesthesia after giving of LA might have a role. Our finding is consistent with that of, ***Soni et al.*** [8] who performed double-blinded and randomized study of 60 women scheduled for unilateral breast surgery to evaluate the incidence of hypotension and the need of vasopressors. They reported that 33% developed hypotension in epidural group due to the hemodynamic perturbations, which were more in epidural group of patients. Therefore, it was associated with more fluid & vasopressor requirement. Also, the results obtained are in accordance with many studies compared thoracic paravertebral and epidural in patients undergoing thoracotomy. ***Davies et al.*** [19] in meta-analysis study found that hypotension less often with TPVB. ***Fadel and Reda*** [20] reported that 50% of patients in epidural group showed hypotension, whereas 10 % in paravertebral group. ***Júnior et al.*** [21] in meta-analysis study reported that epidural anesthesia was associated with a higher incidence of hypotension compared to paravertebral block. ***Biswas et al.*** [22] found that the incidence of hypotension and bradycardia in patients receiving thoracic epidural was significantly higher (23.3% and 6.67% respectively) as compared to TPVB. ***Casati et al.*** [23] revealed that hypotension (19%) was observed in patients of epidural group. Besides. ***Oktavia*** [7] found that hypotension(80%) and bradycardia (40%) was more frequent in TE. ***Lahiry et al.*** [14] found that the incidence of hypotension (13.3%) and bradycardia (16.6%) in the TE. ***Rajan et al.*** [15] reported that the incidence of hypotension was 8 (26.6%) and bradycardia was 6 (20%) in the TE. In addition, ***Belzarena*** [23] found that the incidence of hypotension was (60%) and bradycardia was (15%) in the TE. **Postoperative nausea and vomiting, (PONV**) can result in serious adverse effects extending the duration of hospital care with decreased satisfaction. In terms of PONV, this study showed that 4 patients in TE group (20%) and only 2 patients in Pecs group (10%). PONV was treated with 10 mg metoclopramide and ondansetron 4 mg. The lower incidence of PONV in Pecs group in comparison with TE group might be due to the lower analgesic consumption as a result of adequate pain relief, which might play a role. In agreement with our results, ***Soni et al.*** [8] observed PONV in patients undergoing breast surgery. They reported that 20% patients experienced nausea and vomiting in epidural group compared to 7% in paravertebral group. They showed that patients in paravertebral group suffered from less nausea and vomiting because the hemodynamic perturbations were more

in epidural group of patients, so it was associated with more side effects like nausea and vomiting. In the same line, ***Wahba et al.*** [9] in their study they observed that PONV was comparable between TPVB (56.7%) and Pecs (53.3%). The higher incidence might be because of the high dose used of morphine. Also, ***Bashandy and Abbas*** [12] **and** ***Yuki et al.*** [17] studied MRM patients under GA with and without Pecs blocks, they found lower PONV scores in the Pecs group in MRM surgery. In contrary with the present results, ***Biswas et al.*** [22] found that the incidence of nausea and vomiting was similar in epidural and paravertebral in thoracotomy patients. The use of opioid with LAs infusion might explain the similarity of the incidence. **As regard surgeon satisfaction** among the studied groups, the surgeons were satisfied with patients underwent Pecs block as 14 patients (46.6) with very good and excellent grades than TE group with no patients with very good or excellent grades. We explained that because of hydrodissection produced by Pecs block between PM and pmm which facilitate dissection intraoperative in MRM.

CONCLUSION

Pecs blocks can produce excellent pain relief during the first eight post-operative hours. They hold great promise due to their simplicity, easy-to-learn techniques and relative lack of contraindications and complications. It maintained hemodynamic stability as compared to TE. In addition, it produced low pain scores and less total meperidine (Pethidine) consumption in the early post-operative period after unilateral breast cancer surgery. These advantages, suggest the usefulness especially in outpatient surgery. Besides, it made hydro-dissection between pectorlis major and minor muscles which increased surgeon satisfaction.

CONFLICTS OF INTEREST

There are no conflicts of interest.

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