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Evaluation of Postoperative Pain in Patients Undergoing Erector Spinae Plane Block in Breast Surgeries

Meme Cerrahilerinde Erektör Spina Plan Blok Yapılan Hastalarda Postoperatif Dönemde Ağrının Değerlendirilmesi

Gizem Kara[1], Metin Alkan[1], Ramazan Kozan[2], Nuray Camgöz Eryılmaz[1], Mustafa Arslan[1]

[1]Department of Anesthesiology and Reanimation, Gazi University Faculty of Medicine, Ankara, Türkiye
[2]Department of General Surgery, Gazi University Faculty of Medicine, Ankara, Türkiye

ABSTRACT

Objective: Postoperative pain remains a significant issue in mastectomy patients, and in recent years, regional block techniques have been frequently used in treatment. In this study, we evaluated the analgesic efficacy of erector spinae plane block (ESPB) in patients undergoing breast surgery.

Methods: Our study was conducted retrospectively by reviewing the data from medical records of 94 adult female patients with ASA I-II-III who underwent breast surgery. Patients were divided into two groups: the control group (Group 1) and the ESPB group (Group 2). Both groups received postoperative intravenous patient-controlled analgesia (IV-PCA) tramadol for 24 hours. The primary objective was to assess pain intensity and postoperative opioid requirement using the visual analogue scale (VAS) score. Additionally, postoperative hemodynamic data, adverse effects, demand for bolus tramadol from PCA, number of bolus doses received, total tramadol dose given, need for additional analgesia, and patient satisfaction were evaluated.

Results: No difference was found in postoperative hemodynamic data. VAS scores at postoperative 1st, 2nd, and 4th hours were significantly higher in the control group than the ESP group (p=0.002, p<0.0001, p=0.005, respectively). Postoperative nausea and vomiting were observed in 9.1% of patients in Group 1, whereas none were observed in Group 2, and this difference was significant in Group 1 (X^2=4.747, p=0.029). Additional analgesic requirement at 12 hours was observed in 20.5% of patients in Group 1, while 2% in Group 2, and the difference was significant (X^2=8.385, p=0.004). There was no significant difference between the groups in terms of PCA data and patient satisfaction.

ÖZ

Amaç: Mastektomi hastalarında postoperatif ağrı halen önemli bir sorun olmaya devam etmekte ve bu konuda son yıllarda rejyonel blok teknikleri tedavide sıklıkla kullanılmaktadır. Biz bu çalışmada meme cerrahisi geçiren hastalarda uygulanan erektör spina plan bloğun (ESPB) analjezik etkinliğini değerlendirdik.

Yöntemler: Çalışmamız meme cerrahisi geçiren ASA I-II–III 94 yetişkin kadın hastanın verileri dosya kayıtlarından retrospektif olarak taranarak gerçekleştirildi. Hastalar kontrol grubu (Grup 1) ve ESPB (Grup 2) olarak iki gruba ayrıldı. Her iki gruba da 24 saat boyunca postoperatif intravenöz hasta kontrollü analjezi (İV-HKA) tramadol uygulandı. Birincil hedef olarak görsel analog ölçek (VAS) skoru kullanılarak ağrı şiddeti ve postoperatif opioid ihtiyacının değerlendirilmesi amaçlandı. Ayrıca hastaların postoperatif hemodinamik verileri, oluşan yan etkiler, tramadol HKA'dan sağlanan bolus talebi (demand), kaç kez bolus doz tramadol aldığı (bolus) ve total verilen tramadol dozu, ek analjezik ihtiyacı ve hasta memnuniyetleri değerlendirildi.

Bulgular: Postoperatif hemodinamik veriler arasında farklılık tespit edilemedi. Postoperatif 1., 2., ve 4. saat ölçüm VAS değerleri kontrol grubunda ESP grubuna göre anlamlı olarak yüksek bulundu (p=0.002, p<0.0001, p=0.005, sırasıyla). Postoperatif 1. saat bulantı kusma Grup 1'de hastaların %9.1'inde görülürken Grup 2'de hiçbir hastada görülmedi ve Grup 1'de anlamlı olarak fazla tespit edildi (X^2=4.747, p=0.029). Ek analjezi ihtiyacı 12. saatte Grup 1'de hastaların %20.5'inde, Grup 2'de ise %2'sinde görülüp anlamlı farklılık tespit edildi (X^2=8.385, p=0.004). Her iki grupta HKA verileri ve hasta memnuniyetleri açısından anlamlı bir farklılık tespit edilmedi.

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Address for Correspondence/Yazışma Adresi: Metin Alkan, Assoc. Prof. Department of Anesthesiology and Reanimation, Gazi University Faculty of Medicine, Ankara, Türkiye
E-mail / E-posta: metoalkan@gmail.com
ORCID ID: orcid.org/0000-0002-0043-8091

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ABSTRACT

Conclusion: Although ESP block reduced VAS scores in the early postoperative hours, we did not detect any effect on total tramadol consumption.

Keywords: Erector spinae plane block, mastectomy, postoperative pain, patient-controlled analgesia, opioid consumption, tramadol

ÖZ

Sonuç: ESP blok postoperatif erken saatlerdeki VAS değerlerini düşürmesine karşın toplam tramadol tüketimi üzerine herhangi bir etkisini tespit edemedik.

Anahtar Sözcükler: Erektör spina plan bloğu, mastektomi, postoperatif ağrı, hasta kontrollü analjezi, opioid tüketimi, tramadol

INTRODUCTION

Breast cancer, being one of the most commonly diagnosed cancers, is primarily and most effectively treated with surgical resection (1). However, many patients experience severe postoperative acute pain following surgery. Studies indicate that 60% of women complain of severe acute pain (2). Consequently, both the acute pain itself and the side effects associated with opioids commonly used in treatment can distress patients. Moreover, untreated acute pain can become chronic and significantly reduce patients' quality of life (3). Therefore, a variety of medications and regional techniques can be used in postoperative pain management. However, an optimal method for postoperative analgesia in breast surgery has not yet been defined. In recent years, new regional anesthesia techniques such as fascial plane blocks have begun to be preferred by clinicians for this purpose. Erector spinae plane block (ESPB), successfullyapplied and described by Forero et al. (4) for thoracic neuropathic pain, has been successfully applied in breast surgery by Bonvicini et al. (5). ESPB has become a popular block in recent times due to its ease of procedure and very low complication rates when performed under ultrasound guidance. Its contribution to analgesia management has been observed in many surgical areas when applied at different levels, and its use in daily practice is becoming more widespread. However, debates about its effectiveness continue (6). In this study, we aimed to investigate the effect of preoperative ESPB at the T4 level on postoperative opioid requirement and outcomes in patients undergoing radical mastectomy, with or without axillary lymph node dissection surgery.

MATERIALS AND METHODS

This study was conducted retrospectively between February 1, 2022, and August 1, 2022, at the Department of Anesthesiology and Reanimation, Gazi University Faculty of Medicine after obtaining ethics committee approval (approval number: 2022-03/1690, date: 27.01.2022). Female patients aged 18 and over with ASA (American Society of Anesthesiologists) I-II-III undergoing radical mastectomy or radical mastectomy with axillary lymph node dissection were identified from medical records and detailed postoperative analgesia forms routinely filled out in our clinic.

Patients undergoing mastectomy (radical mastectomy and radical mastectomy with axillary lymph node dissection) were brought to the operating table, and their vital parameters were monitored. Standard general anesthesia was administered using endotracheal intubation (induction with propofol, remifentanil, and rocuronium, followed by maintenance with sevoflurane and remifentanil). After endotracheal intubation, patients scheduled for ESPB were placed in the lateral decubitus position. The T4 spinous process was localized with palpation assistance. After ensuring appropriate sterilization conditions, ultrasound (LOGIQ e, GE Healthcare, USA) was used to visualize the transverse process in the lateral aspect, 2-2.5 cm from the midline. Once the transverse process was visualized, the procedure began using a 22-gauge, 50 mm needle (SonoPlex®) (Figure 1). After confirming the location between the transverse process and erector spinae muscle using hydrodissection, 20 mL of 0.25% bupivacaine (Marcaine vial, Eczacıbaşı, Türkiye) was injected into this area to perform the unilateral ESPB procedure.

In our clinic, all patients undergoing mastectomy surgery routinely receive intravenous (IV) tramadol patient-controlled analgesia (PCA) for postoperative analgesia. Using data obtained from medical records, patients who received only general anesthesia were designated as the control group (Group 1), while those who received general anesthesia along with ESPB formed Group 2.

Demographic data of the patients (age, body weight, ASA classification) were recorded from the medical records. Operation duration (minutes), postoperative visual analogue scale (VAS) pain scores at rest at 0 (control), 1, 2, 4, 6, 12, and 24 hours, systolic (SBP), diastolic (DBP), and mean arterial pressure (MAP) values (mmHg), and heart rates (HR) (beats/min) were recorded from the postoperative analgesia record forms. Postoperative side effects, demand for bolus tramadol from PCA, number of bolus doses received, total tramadol dose given (mg), need for additional analgesics (20 mg tenoxicam), and patient satisfaction were assessed and recorded using a four-point scale (1: lowest, 4: highest).

Statistical Analysis

Statistical analysis was performed using the SPSS 20.0 software. Statistical analysis data were presented as mean ± standard deviation, standard error, (minimum-maximum), and n (%). The distribution of measurable parameters was determined as normal or abnormal

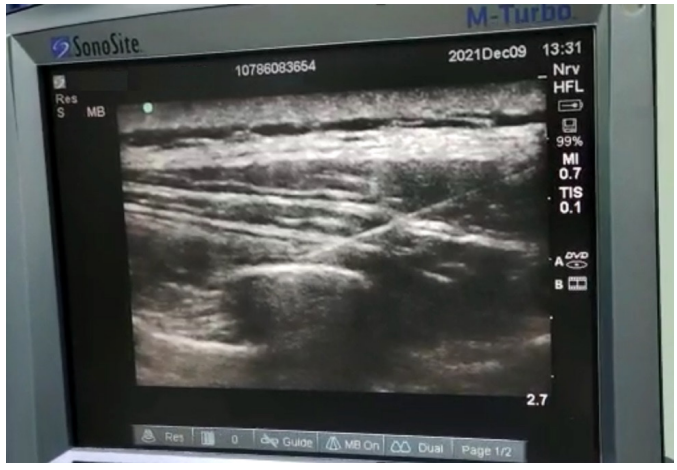

Figure 1. The ultrasound image shows the ESPB procedure performed at the T4 vertebral level using an in-plane linear probe in our clinic.

ESPB: Efficacy of erector spinae plane block

by applying the Kolmogorov-Smirnov test. Group comparisons for variables such as age, body weight, operation duration, PCA total and bolus, and patient satisfaction were assessed using the Student's t-test. ASA, PCA demand and bolus requirements, side effects, number of patients receiving additional analgesics, and patient satisfaction were evaluated using the chi-square or Fisher's exact chi-square tests. Repeated measures analysis of variance was used to assess variables such as HR, SBP, DBP, MAP, and VAS scores. Post-hoc Scheffe test was applied for between-group comparisons in case of significance. In repeated measures variance analysis, the within-group control values of HR, SBP, DBP, MAP, and VAS data, where the time factor was significant, were compared using the Post-hoc Bonferroni test. A test result was considered significant if $p<0.05$.

RESULTS

A total of 94 patients with ASA I-II-III classification were included in this study. There were no statistically significant differences in demographic characteristics between the patient groups included in our study (Table 1). When comparing the operation durations between the groups, it was observed that there was no significant difference, and the mean operation durations were similar in both groups (Table 2). The average values of HR data at different measurement times are shown in Table 3. When comparing the HR averages in terms of changes over time, no significant difference was found between the groups. However, when investigating intra-group differences over time, relative to the control value, it was observed that in Group 1, the mean HR values at 1 and 2 hours were statistically different from the control HR average ($p<0.0001$, $p=0.004$, respectively). In Group 2, the mean HR values were statistically different from the control HR average at the respective measurement times ($p<0.0001$, $p<0.0001$, $p=0.001$, $p=0.001$, $p=0.002$, $p=0.001$, respectively) (Table 3).

The average values of systolic blood pressure (SBP) data at different measurement times are shown in Table 4. When comparing the SBP averages between the groups in terms of changes over time, no significant difference was found between the groups. However, when investigating intra-group differences over time relative to the control value, it was observed that in both groups, the mean SBP values were statistically different from the control SBP average at all measurement times ($p<0.0001$, all). The average values of diastolic blood pressure (DBP) data at different measurement times are shown in Table 5. When comparing the DBP averages between the groups in terms of changes over time, no significant difference was found between the groups. However, when investigating intra-group differences over time relative to the control value, it was observed that in both groups, the mean DBP values were statistically different from the control DBP average at all measurement times (Group 1 control-2nd hour, $p=0.002$; Group 1 control-4th hour, $p=0.001$; Group 2 control-1st hour, $p=0.004$, others $p<0.0001$).

The average values of MAP data at different measurement times are presented in Table 6. When comparing the MAP averages between the groups in terms of changes over time, no significant difference was observed between the groups. However, when investigating intra-group differences over time relative to the control value, it was noted that in both groups, the mean MAP values were statistically different from the control MAP average at all measurement times except the 1st hour, ($p<0.0001$, all). The average values of VAS data at different measurement times are presented in Table 7. When comparing the VAS averages between the groups in terms of changes over time, VAS values at the 1st, 2nd, and 4th-hour measurements were found to be significantly higher in Group 1 compared to Group 2 ($p=0.002$, $p<0.0001$, $p=0.005$, respectively). When investigating intra-group differences over time relative to the control value, it was observed that in Group 1, the mean VAS values at the 4th, 6th, 12th, and 24th hour were statistically different from the control VAS average ($p=0.003$, $p<0.0001$, $p<0.0001$, $p<0.0001$, respectively), while in Group 2, the mean VAS values were statistically different from the control VAS average at all measurement times except the 1st hour ($p=0.004$, $p<0.0001$, $p<0.0001$, $p<0.0001$, $p<0.0001$, respectively), (Table 7).

Table 1. Demographic characteristics of the cases in the groups [Mean ± SD (Min.-Max.), n (%)]

	Group 1 (n=44)	Group 2 (n=50)	p
Age (year)	56.55±12.96 (34-88)	54.60±12.59 (32-79)	0.463
Body weight (kg)	74.18±14.44 (50-123)	68.98±12.61 (46-102)	0.068
ASA (I/II/III)	3(6.8)/30(68.2)/11(25)	4(8)/32(64)/14(28)	X^2=0.185 p=0.912

SD: Standard deviation, Min.: Minimum, Max.: Maximum, ASA: American Society of Anesthesiologists

Table 2. Operation time [Mean ± SD (Min.-Max.)]

	Group 1 (n=44)	Group 2 (n=50)	p
Operation time (Min.)	134.30±38.04 (60-230)	136.10±38.35 (60-240)	0.820

SD: Standard deviation, Min.: Minimum, Max.: Maximum

Table 3. Distribution of heart rates (beats/min.) in groups [Mean ± SD (Min.-Max.)]

Time	Group 1 (n=44)	Group 2 (n=50)	p
Control	84.75±17.86 (54-133)	84.14±11.58 (53-112)	0.843
1st hour	74.70±11.15+ (60-103)	77.80±11.64+ (58-98)	0.193
2nd hour	76.68±9.51+ (56-102)	77.02±10.67+ (58-100)	0.872
4th hour	78.27±10.93 (55-116)	77.34±10.25+ (56-96)	0.671
6th hour	78.98±9.85 (58-110)	77.52±11.70+ (57-100)	0.519
12th hour	80.64±7.76 (60-95)	77.88±10.14+ (56-98)	0.146
24th hour	80.27±7.36 (62-101)	77.80±9.11+ (58-97)	0.155

+: p<0.05 (compared to within-group control).
SD: Standard deviation, Min.: Minimum, Max.: Maximum

Table 4. Distribution of systolic arterial blood pressures (mmHg) between groups [Mean ± SD (Min.-Max.)]

Time	Group 1 (n=44)	Group 2 (n=50)	p
Control	136.86±24.75 (97–205)	135.46±21.68 (100-180)	0.770
1st hour	119.80±15.74+ (80-160)	120.02±14.85+ (90-150)	0.943
2nd hour	117.20±14.17+ (100-160)	116.36±14.00+ (90-150)	0.772
4th hour	115.27±12.05+ (90-140)	113.82±12.50+ (90-140)	0.569
6th hour	113.80±10.37+ (100-130)	112.58±11.77+ (90-140)	0.599
12th hour	111.93±10.41+ (95-135)	113.34±10.45+ (90-140)	0.515
24th hour	112.27±10.76+ (90-140)	114.24±9.34+ (100-130)	0.345

+: p<0.05 (compared to within-group control).
SD: Standard deviation, Min.: Minimum, Max.: Maximum

Table 5. Distribution of diastolic arterial blood pressures (mmHg) in groups [Mean ± SD (Min.-Max.)]

Time	Group 1 (n=44)	Group 2 (n=50)	p
Control	80.09±14.64 (57-139)	81.86±13.54 (51-113)	0.544
1st hour	71.89±9.82+ (40-100)	73.90±10.73+ (60-100)	0.348
2nd hour	71.55±9.82+ (60-100)	71.26±10.32+ (40-90)	0.891
4th hour	70.68±8.26+ (60-85)	70.36±8.67+ (60-90)	0.855
6th hour	67.39±7.21+ (60-80)	68.70±8.48+ (60-82)	0.424
12th hour	70.25±7.17+ (60-80)	71.02±7.05+ (60-90)	0.601
24th hour	69.70±7.76+ (50-82)	71.06±7.98+ (60-82)	0.407

+: p<0.05 (compared to within-group control),
SD: Standard deviation, Min.: Minimum, Max.: Maximum

Side effects determined in the postoperative period are given in Table 8. The only side effects detected were postoperative nausea and vomiting (PONV). While PONV was seen in 9.1% of the patients in Group 1, it was not seen in any patient in Group 2 and was detected significantly more in Group 1 (X^2=4.747, p=0.029). It was found to be similar at other measurement times. PCA data are presented in Table 9. PCA total tramadol consumption via PCA was found to be similar in the demand and bolus groups. The need for postoperative additional analgesia (tenoxicam 20 mg) is presented in Table 10. At the 12th hour, the requirement for additional analgesia was observed in 20.5% of patients in Group 1 and 2% of patients in Group 2. The number of patients requiring additional analgesia at the 12th hour was significantly higher in Group 1 (X^2=8.385, p=0.004). Similar observations were made at other measurement times. Patient satisfaction was found to be similar between the groups (Table 11).

Table 6. Distribution of mean arterial blood pressures (mmHg) between groups [Mean ± SD (Min.-Max.)]

Time	Group 1 (n=44)	Group 2 (n=50)	p
Control	99.01±16.93 (70–161)	99.73±15.20 (71-135)	0.830
1st hour	87.86±11.06 (53-120)	89.27±10.12 (72-110)	0.537
2nd hour	86.77±10.66+ (73-120)	86.29±10.11+ (63-106)	0.826
4th hour	85.55±8.29+ (70-101)	84.85±9.28+ (72-106)	0.703
6th hour	82.86±6.93+ (73-96)	83.33±8.84+ (70-100)	0.777
12th hour	84.14±6.80+ (71-96)	85.13±6.94+ (70-106)	0.491
24th hour	83.89±8.00+ (63-100)	85.45±7.55+ (73-96)	0.334

+: p<0.05 (compared to within-group control),
SD: Standard deviation, Min.: Minimum, Max.: Maximum

Table 7. Distribution of visual analogue scale values across groups [Mean ± SH (Min.-Max.)]

Time	Group 1 (n=44)	Group 2 (n=50)	p
Control (Postoperative first VAS score)	4.68±0.53 (0-10)	3.84±0.42 (0-9)	0.215
1st hour	5.45±0.45 (0-10)	3.54±0.38* (0-10)	0.002
2nd hour	4.34±0.37 (0-9)	2.46±0.29*,+ (0-8)	<0.0001
4th hour	3.14±0.30+ (0-8)	2.00±0.23*,+ (0-6)	0.005
6th hour	1.93±0.28+ (0-7)	1.36±0.20+ (0-5)	0.093
12th hour	1.45±0.29+ (0-9)	0.88±0.13+ (0-4)	0.077
24th hour	1.39±0.25+ (0-6)	0.92±0.20+ (0-9)	0.144

*: p<0.05 (compared with group 1),
+: p<0.05 (compared to within-group control).
SD: Standard deviation, Min.: Minimum, Max.: Maximum, VAS: Visual Analogue Scale

Table 8. Postoperative nausea and vomiting (PONV) [n (%)]

Time	Group 1 (n=44)	Group 2 (n=50)	p
Control (Postoperative first VAS score)	1 (2.3)	-	X^2=1.530 p=0.468
1st hour	4 (9.1)	-*	X^2=4.747 p=0.029
2nd hour	2 (4.5)	-	X^2=2.322 p=0.128
4th hour	2 (4.5)	-	X^2=2.322 p=0.128
6th hour	2 (4.5)	1 (2)	X^2=0.496 p=0.481
12th hour	2 (4.5)	-	X^2=2.322 p=0.128
24th hour	-	-	-

*: p<0.05 (compared with group 1)
VAS: Visual Analogue Scale

DISCUSSSION

Postoperative pain remains a significant issue following breast cancer surgery, leading to chronic persistent pain in approximately half of the patients (7). Therefore, investigating effective techniques to reduce postoperative pain is crucial. In this study, we aimed to investigate the postoperative analgesic effects of ESPB in radical mastectomy, and radical mastectomy with axillary lymph node dissection. The results of our study revealed that ESPB did not affect postoperative hemodynamic parameters. However, VAS scores at 1st, 2nd, and 4th hours were significantly higher in the control group compared to the ESPB group. Despite there being no significant postoperative side effects or complications observed in either group, the incidence of PONV at the 1st hour was significantly higher in the control group compared to the ESPB group. Additionally, there was a significantly higher need for rescue analgesia at the 1st hour in the control group compared to the ESPB group, despite similar total tramadol consumption, demand, and bolus requests from the PCA system between the groups. Furthermore, patient satisfaction did not differ between the two groups.

Table 9. Patient-controlled analgesia (PCA) data [Mean ± SD (Min.-Max.), n (%)]

	Group 1 (n=44)	Group 2 (n=50)	p
PCA tramadol total (mg)	188.82±17.45 (29.6-500)	222.23±13.71 (118-498.5)	0.131
PCA demand	14.38±6.06 (1-91)	9.65±2.70 (1-89)	0.447
PCA bolus	5.18±1.13 (1-21)	6.87±2.20 (1-88)	0.516
PCA demand (yes/no)	34(77.3)/10(22.7)	43(86)/7(14)	X^2=1.203 p=0.273
PCA bolus (yes/no)	34(77.3)/10(22.7)	40(80)/10(20)	X^2=0.104 p=0.747

PCA: Patient-controlled analgesia

Table 10. Distribution of additional analgesia to groups [n (%)]

Time	Group 1 (n=44)	Group 2 (n=50)	p
Time	15 (34.1)	13 (26)	X^2=0.733 p=0.392
Control	10 (22.7)	6 (12)	X^2=1.907 p=0.167
1st hour	10 (22.7)	12 (24)	X^2=0.021 p=0.884
2nd hour	7 (15.9)	4 (8)	X^2=1.417 p=0.234
4th hour	7 (15.9)	9 (18)	X^2=0.072 p=0.788
6th hour	9 (20.5)	1 (2)*	X^2=8.385 p=0.004
12th hour	6 (13.6)	2 (4)	X^2=2.791 p=0.095

*: p<0.05 (compared with group 1)

Table 11. Patient satisfaction with anesthesia [Mean ± SD (Min.-Max.), n(%)]

	Group 1 (n=44)	Group 2 (n=50)	p
Patient satisfaction	3.23±0.67 (1-4)	3.10±0.73 (2-4)	0.385
Patient satisfaction (1/2/3/4)	1(2.3)/3(6.8)/25(56.8)/15(34.1)	0(0)/11(22)/23(46)/16(32)	X^2=5.326 p=0.149

SD: Standard deviation, Min.: Minimum, Max.: Maximum

When examining the effects of ESPB on hemodynamic parameters, we found no significant difference between the groups. These findings are consistent with previous studies in the literature (8,9). In our study, no patient in the ESPB group experienced any complications related to the block technique. Besides PONV in the perioperative period, no other side effects or complications were encountered. The observed incidence of PONV at the 1st hour was 9.1% in the control group, while no patients in the ESPB group experienced PONV. This difference was statistically significant (X2=4.747, p=0.029). However, no significant differences were noted at other measurement times. In a meta-analysis conducted by Hussain et al. (6), evaluating the analgesic benefits of adding ESPB to parenteral analgesia in twelve studies (699 patients), complications related to the block were assessed in eight studies, with no complications reported in any patients, while opioid-related side effects were reported in eleven studies. Compared to patients who received parenteral opioids, lower rates of nausea and vomiting were reported in patients who received ESPB. Similarly, another meta-analysis reported lower rates of PONV in patients who received ESPB (10). These findings are consistent with the low incidence of PONV observed in the ESPB group at the first hour in our study. He W et al. (11) suggested that ESPB slightly reduced the incidence of PONV (10% vs. 30%) in patients undergoing mastectomy with axillary lymph node dissection or radical mastectomy, attributing this to the potential reduction in intraoperative opioid doses due to ESPB use. We speculate that the higher incidence of nausea and vomiting observed at the 1st hour in the control group may be related to the higher doses of opioids used intraoperatively in this group, despite effective analgesia in the ESPB group during the intraoperative period.

In our study when comparing VAS mean scores between groups over time, we found that VAS scores at 1st, 2nd, and 4th hours were significantly higher in the Control group compared to the ESPB group (p=0.002, p<0.0001, p=0.005, respectively). Zhang et al. (10) conducted a meta-analysis of 11 randomized controlled trials involving 679 patients, in which they compared the ESPB group with the general anesthesia group. They found that the ESPB group had lower pain scores at four time points (1, 6, 12, and 24 hours after surgery) compared to the general anesthesia group. This is consistent with our study findings, where VAS scores at 1st, 2nd, and 4th hours were lower in the ESPB group. We believe that the lack of differences at other time points in our study may be attributed to the duration of block, and the tramadol and additional analgesics administered via IV PCA in both groups.

Studies have shown that ESPB reduces postoperative morphine consumption in breast surgery (9,10). Gürkan et al. (12) found that ESPB significantly reduced total morphine consumption from IV PCA at postoperative 1 hour, 6 hours, 12 hours, and 24 hours, compared to the control group, in breast surgery. However, Hussain et al. (6) reported in their meta-analysis that adding ESPB to parenteral analgesia provided statistically significant, but clinically insignificant, short-term benefits following breast cancer surgery. They suggested that routine use of ESPB is not supported, and its benefits and risks should be evaluated on a case-by-case basis. Although the study by Gürkan et al. (12) was methodologically similar to ours, we did not find a statistically significant difference in total tramadol doses administered via IV PCA over 24 hours, compared to the control group (188.82±17.45 vs. 222.23±13.71 mg, respectively). The rich and complex innervation of breast tissue, the different neuronal structure of the axillary region, and breast tails, and unclear mechanisms related to the spread of ESPB may contribute to different results in studies involving this block (13-17). In our study, we applied ESPB at the T4 level, which is commonly preferred in breast surgery. However, it has been shown that a block applied at the T3 level is more effective in relieving pain in the chest wall and in the axillary region (11).

Although studies have shown that ESPB reduces 24-hour morphine consumption and the need for additional postoperative analgesics (9,10), we did not observe any differences in other time intervals except for the lower requirement for additional analgesia (tenoxicam) in the ESP group at 12 hours (20.5% vs. 2%). We believe that the reason for this could be the sufficiency of tramadol analgesia administered via PCA in both groups. The apparent difference at this time interval may be due to the inadequacy of analgesia during movement, patients in both groups experienced mobilization during this time, despite having sufficient rest. Although ESPB has been reported to increase patient satisfaction in breast surgery (18), Hussain et al. (6) stated in their meta-analysis evaluating the analgesic benefits of adding ESPB to parenteral analgesia following breast cancer surgery that, compared to parenteral opioids, ESPB did not increase patient satisfaction. Similarly, in our study, we did not observe any difference patient satisfaction between the two groups.

Study Limitations

We believe that the most significant limitation of our study is its retrospective design. Additionally, a limitation is that due to the lack of a prospective design, we could not determine the time of the first analgesic requirement.

CONCLUSION

The application of ESPB in mastectomy patients significantly reduced VAS scores in the postoperative first 4 hours without affecting hemodynamic parameters. However, we could not detect any effect on the total tramadol consumption over 24 hours. Although

ESPB appears promising in controlling postoperative analgesia and reducing opioid-related side effects and complications, we believe that further randomized controlled trials are needed in this field.

Ethics

Ethics Committee Approval: Gazi University Faculty of Medicine after obtaining ethics committee approval (approval number: 2022-03/1690, date: 27.01.2022).

Informed Consent: Retrospective study.

Footnotes

Authorship Contributions

Concept: G.K., M.A., R.K., M.Ar., Design: G.K., M.A., R.K., N.C.E., Supervision: M.A., M.Ar., Data Collection or Processing: G.K., M.A., R.K., N.C.E., Analysis or Interpretation: G.K., R.K., N.C.E., Literature Search: G.K., R.K., N.C.E., Writing: G.K., R.K., R.K., Critical Review: M.A., M.Ar.

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