Randomized Controlled Trial

Ultrasound-Guided Erector Spinae Block Versus Ultrasound-Guided Thoracic Paravertebral Block for Pain Relief in Patients With Acute Thoracic Herpes Zoster: A Randomized Controlled Trial

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Background: Severe acute pain is a significant risk factor for postherpetic neuralgia (PHN). The importance of early management in alleviating zoster pain cannot be overstated.

Objectives: This study aimed to determine the efficiency and safety of one bolus injection thoracic paravertebral block (PVB) and erector spinae plane block (ESB) in individuals with acute thoracic herpes zoster (HZ) in preventing PHN.

Study Design: A prospective randomized controlled trial.

Setting: Tanta University Hospitals, Tanta, Egypt.

Methods: Ninety participants over the age of 50 years with chest wall herpetic eruption, lasting shorter than a week along with moderate to severe pain, who got adequate antiviral medication. Patients were chosen at random and classified into 3 equal groups. Group C (control group) did not receive any intervention. Group ESB received US-guided ESB with 25 mg bupivacaine 0.5%, plus 8 mg dexamethasone (10 mL volume). Group PVB received US-guided PVB with 25 mg bupivacaine 0.5%, plus 8 mg dexamethasone (10 mL volume).

Results: Numerical rating scale (NRS) showed insignificant differences at baseline. NRS for pain at 1, 3, 4, 12, and 24 weeks was significantly reduced in group ESB compared to group C and in group PVB than group C and insignificantly different between group ESB and group PVB. Doses of pregabalin and acetaminophen were comparable at 1 week among the studied groups. Doses of pregabalin and acetaminophen at 3, 4, 12, and 24 weeks were significantly lesser in group ESB compared to group C and in group PVB than group C and insignificantly different between group ESB and group PVB. After 3 months, the incidence of persistent herpetic pain was not significantly different between the study groups. After 6 months, the incidence of persistent herpetic pain was statistically significantly lower in groups ESB and PVB than in group C (P = 0.037 and 0.015, respectively) without significant difference between group ESB and group PVB.

Limitations: Small sample size, single center study.

Conclusions: Both ESB and PVB were effective in controlling acute pain and persistent herpetic pain after 6 months (which was evident by lower NRS for pain and doses of pregabalin and acetaminophen), but ESB is safer (no reported pneumothorax and hypotension).

Key words: Erector spinae block, paravertebral block, postherpetic neuralgia, herpes zoster

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Herpes zoster (HZ) is the reactivated form of the varicella-zoster virus (VZV), which normally infects the sensory ganglia and produces excruciating lesions of the skin during initial infection. While the vesicular rash often resolves within a few weeks, pain may continue, resulting in postherpetic neuralgia (PHN) (1).

Acute severe pain and PHN are feared complications of HZ infection (2). The pain lasting for the first 30 days is known as acute herpetic neuralgia. The more severe the acute pain, the higher the likelihood of acquiring PHN (3). When pain continues for over 90 days following the development of the rash, it is referred to as PHN. If sufficient pain relief is not provided during the acute phase of HZ, the chance of developing PHN increases (4).

It is hypothesized that frequent painful stimuli reaching the central nervous system (CNS) may result in central sensitization of the nociceptive system, the primary mechanism responsible for driving persistent pain. Reduced exposure to recurrent painful stimuli and inflammatory factors throughout the acute phase of HZ may alleviate central sensitization and significantly lower the occurrence of chronic pain (5).

The paravertebral block (PVB) is considered among the simplest and most time-efficient treatments for delivering analgesics. It is performed by injecting anesthetic locally into the region directly lateral to the location of the spinal nerves' exit through the intervertebral foramina (5). It is capable of ipsilateral, somatic, segmental, and sympathetic nerve blockage of the highest quality (6). Nevertheless, a slight risk of vascular puncture, pneumothorax, and pleural puncture is probable, as well as the likelihood of toxicity owing to the local anesthetic's quick absorption (7).

The erector spinae plane block (ESB) is a plane block with an interfacial orientation. Studies showed its usefulness in treating severe neuropathic pain. The justification for using ESB is that it has a high probability of acting on the dorsal and ventral rami of the thoracic spinal neurons (8).

The ESB has significant potential as a simple and safe approach as a thoracic analgesic in chronic neuropathic pain along with acute post-surgical or post-traumatic pain (9).

The aim of this research was to evaluate the effectiveness and safety of single injection ESB and thoracic PVB in inhibition of PHN in participants with acute thoracic HZ.

Patients and Methods

This prospective randomized controlled open-label research included 90 participants over the age of 50 with chest wall herpetic eruption lasting shorter than a week along with moderate to severe pain who got adequate antiviral medication. Dermatology clinics referred patients after giving adequate antiviral medication (800 mg acyclovir, 5 times a day, orally administered during the initial 72 hours following eruption).

The study was done at Tanta University Hospitals, Tanta, Egypt, from December 2020 to September 2021 after approval from Institutional Ethical Committee (approval code 32720/11/18) and registration on clinicaltrials.gov (NCT04656821). Each patient provided written informed consent.

Patients who refused, were not receiving appropriate antiviral therapy, had an eruption lasting more than one week, infection at the injection site, had mild pain, steroid therapy, had a history of renal, hepatic, coagulopathy, or malignancies, and were receiving chemotherapy and/or radiotherapy were excluded.

In all patients, monitoring was applied in the form of pulse oximetry, non-invasive blood pressure cuff, and electrocardiogram. A peripheral cannula (20 G) was inserted and secured.

Patients were randomly classified in a parallel way using sealed envelopes into 3 equal groups; each group consisted of 30 patients. A nurse, who didn't participate in the study, generated the random allocation sequence.

The US machine was Philips® (CX50 – Extreme edition). A superficial (5-12 MHz) US transducer was used. The blocks were performed under aseptic precautions.

Group I: Control group (n = 30)

No intervention was done.

Group II: Erector Spinae Block (ESB) (n = 30)

The patient was seated after the transducer was positioned longitudinally, 3 cm lateral to the target level's spinous process. The rhomboid major, trapezius, and erector spinae muscles were recognized as superficial to the hyperechoic transverse process shadow. However, when the rhomboid major muscle disappeared, this indicated that we were at the 7th thoracic vertebra's level. The site of the needle insertion was infiltrated locally with 2 of 2.0% lidocaine. Under US imaging visualization, an 8-cm 22-gauge spinal needle was injected in the cephalic direction until the needle tip contacted the transverse process. The needle was then gradu-

ally removed until it was inside the interfacial plane underneath the erector spinae muscle. Following a 3 mL testing dose of normal saline containing epinephrine (1:200,000), 2.5 mL bupivacaine 0.5%, in addition to 8 mg dexamethasone with a 10 mL total volume. (The end concentration of bupivacaine was 0.25%).

Group III: Thoracic PVB (n = 30)

The patient was seated, and the transducer was positioned laterally 3 cm to the midline, defining the spinous process, pleura, transverse process, the PV space, and superior costotransverse ligament. The trapezius, rhomboid major, and erector spinae muscles were recognized as superficial to the hyperechoic transverse process shadow. However, when the rhomboid major muscle disappeared, this indicated that we were at the 7th thoracic vertebra's level. Local infiltration using 2-3 mL of 2.0% lignocaine was done. A spinal 22-gauge needle was injected at the cephalic side of the transducer using an in-plane technique, and the needle directed towards the costotransverse ligament (CTL). The passage of the needle through the CTL was associated with a pop, informing that the superior costotransverse ligament was passed. Following a 3 mL testing dose of normal saline containing epinephrine (1:200,000), 2.5 mL bupivacaine 0.5%, in addition to 8 mg dexamethasone with a 10 mL total volume. (The end concentration of bupivacaine was 0.25%).

For 2 hours, the patient was observed in the recovery room. The recovery room nurse, unaware of the research methodology, checked and recorded the pain score after one hour.

Each patient got 150 mg pregabalin twice daily. Each session assessed their pain level as soon as patients reported mild discomfort (NRS for pain score ≤ 3). The pregabalin dosage was lowered by 75 mg every other day as long as the pain score remained 3 after every decrease. If the NRS for pain exceeded 3, the patient was reverted to the last controlled pregabalin dosage, and the outcome was documented in the patient record. Acetaminophen was offered on request as a rescue analgesic at a dosage of 1,000 mg. A maximum daily dosage of 4,000 mg was permitted for people with chronic pain ≥ 4. The consumption of analgesics was at 1, 3, 4, 12, and 24 weeks.

Patients' pain intensity was determined using the NRS for pain (0 = not in pain while 10 = severe, unbearable pain) prior to the block (baseline). After that, a check-up occurred every week for the next 2 months and then in 2 weeks intervals for 4 months. The statistical analysis comprised values at baseline, 3, 4, 12, and 24 weeks. Follow-up via telephone was permitted for patients who could not attend the 6-month follow-up appointment at the pain clinic and if the patient complained of severe pain. Additional visits were conducted.

The duration of total pain resolution was documented from the date of the block to the complete elimination of herpetic pain.

Side effects and complications (hypotension, pneumothorax, local anesthetic toxicity, and respiratory depression) were recorded.

The primary outcome was the incidence of persistent herpetic pain after 6 months. The secondary outcomes were NRS, total consumption of acetaminophen and pregabalin, and time needed to alleviate the pain, adverse effects, and complications completely.

Sample Size Calculation

A World Health Organization and Centers for Disease Control and Prevention (CDC) statistic tool (EpiInfo) was used to calculate the sample size. $N > 28$ was chosen as the sample size because it met the following requirements: the study had a 95% level of confidence, an 80 percent level of power, a 1:1 group ratio, and an expected 30% of patients still experiencing persistent herpetic pain 6 months later (10) in the control group, and 5% in the treatment groups. In order to prevent dropouts, we assigned 30 cases to each of the 2 groups.

Statistical Analysis

Statistical analysis was performed using the SPSS (Statistical Package for the Social Sciences) version 25 (IBM Inc., Chicago, IL). Tests for normality and histograms were used to determine the distribution of quantitative data. The F test was used to compare the means and standard deviations (SDs) of the parametric variables among the 3 groups, with a post hoc (Tukey) test used to compare the 2. The Kruskal-Wallis and Mann-Whitney (U) tests were used to examine nonparametric variables (for example, pain NRS). The frequency and percentage of categorical variables were determined and compared utilizing the chi-square test, a statistical tool. To establish statistical significance, we used a 2-tailed *P* value of 0.05.

Results

In this research, 126 patients were considered for suitability: 21 patients did not fit the inclusion criteria, and 6 patients refused to participate in the study. The

remaining 99 patients were randomly allocated into 3 equal groups (30 patients each). Ninety patients were followed-up and analyzed statistically. Nine patients were lost during follow-up and replaced (Fig. 1).

There were insignificant differences among the studied groups regarding age, gender, weight, and affected side (Table 1).

When comparing the 3 groups, the numeric rating scale showed insignificant differences at baseline but showed significant differences at 1, 3, 4, 12, and 24 weeks (P = 0.001, 0.004, 0.040, 0.003, and 0.048, respectively). Numeric rating scale scores at 1, 3, 4, 12 and 24 weeks were significantly lower in group ESB compared to group C ($P1$ = 0.035, 0.032, 0.043, 0.017 and 0.036, respectively) and in group PVB compared to group C ($P2$ < 0.000, 0.001, 0.006, 0.001 and 0.022, respectively) There was insignificant difference between group ESB compared to group PVB (Table 2).

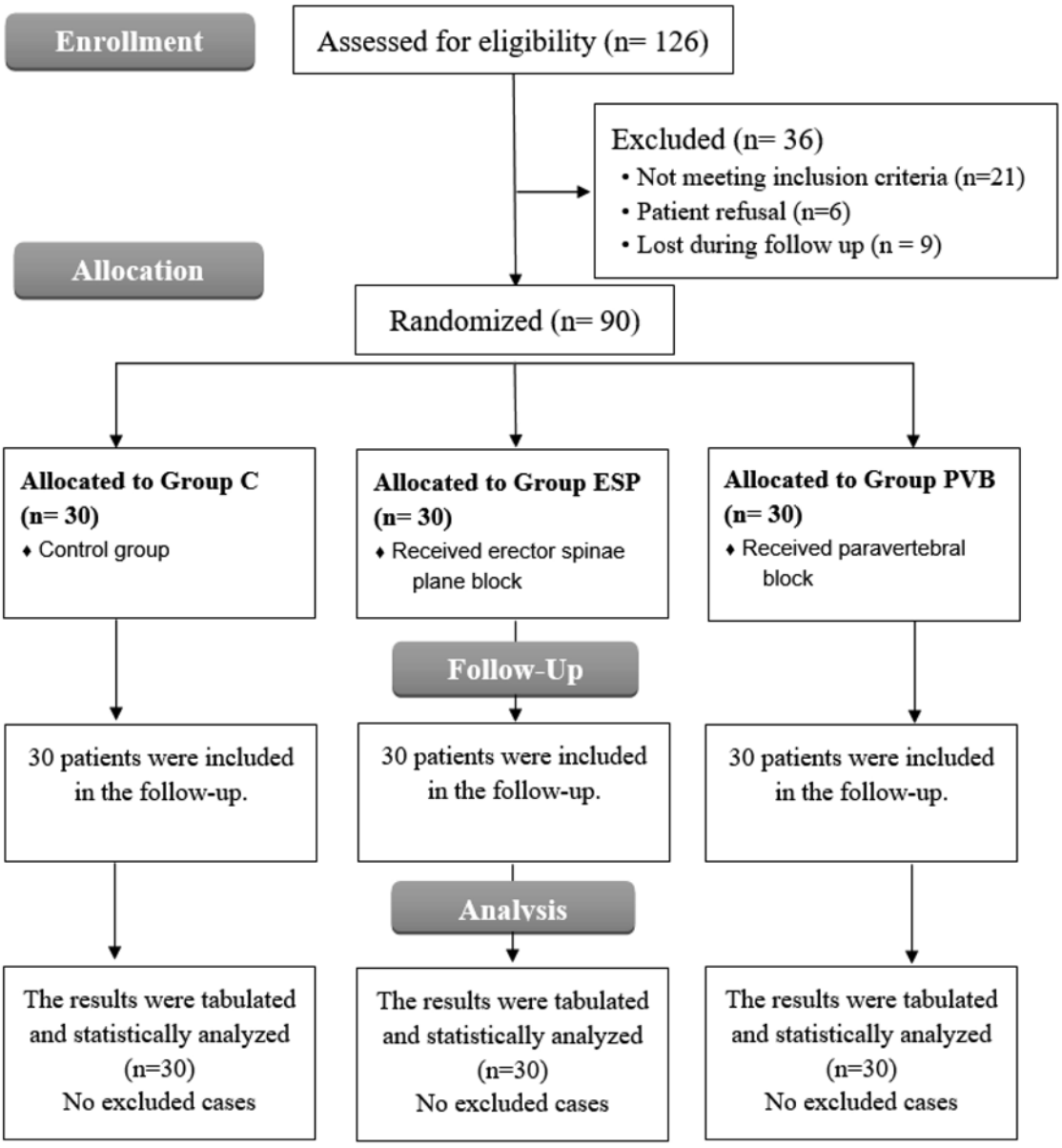

Fig. 1. *CONSORT flowchart of the studied patients*

The dose of pregabalin was the same at 1 week and was significantly different at 3, 4, 12, and 24 weeks ($P < 0.001$, 0.011, 0.019, 0.013, 0.019 and 0.003, respectively). The dose of pregabalin at 3, 4, 12, and 24 weeks were significantly lower in group ESB compared to group C (*P1* = 0.006, 0.025, 0.028, 0.046, 0.041 and 0.013, respectively) and in group PVB compared to group C (*P2* < 0.001, 0.008, 0.034, 0.017 and 0.024, respectively). There was insignificant difference between group ESB and group PVB (Table 3).

The dose of acetaminophen used was insignificantly different among the studied groups at 1 week. However, it showed a significant difference at 3, 4, 12, and 24 weeks ($P < 0.001$, 0.002, 0.035, 0.022, and 0.006, respectively). The dose of acetaminophen used at 3, 4, 12, and 24 weeks were significantly lower in group ESB compared to group C (*P1* < 0.001, 0.006, 0.030, 0.042, and 0.024, respectively) and in group PVB compared to group C (*P2* < 0.001, 0.006, 0.045, 0.032, and 0.010, respectively). There was an insignificant difference between group ESB and group PVB (Table 4).

PHN after 3 months was reported in 12 (40%) patients in group C, 8 (26.7%) patients in group ESB, and 6 (20%) patients in group PVB. After 3 months, the incidence of chronic herpetic pain was not significantly different between the study groups (Table 5).

Postherpetic neuralgia after 6 months was reported in 11 (36.7%) patients in group C, 4 (13.3%) patients in group ESB, and 3 and (10%) patients in group PVB. Incidence of persistent herpetic pain after 6 months was significantly decreased in group ESB and group PVB compared to group C ($P = 0.037$ and 0.015, respectively) without a significant difference between group ESB and group PVB (Table 5).

Table 1. *Demographic data of the studied groups.*

		Group C (n = 30)	Group ESB (n = 30)	Group PVB (n = 30)	*P* value
Age (years)		61.3 ± 6.73	59.47 ± 6.69	60.63 ± 7.21	0.582
Gender	Male	13 (43.3%)	12 (40%)	14 (46.7%)	0.873
	Female	17 (56.7%)	18 (60%)	16 (53.3%)	
Weight (kg)		80.97 ± 10.77	78.40 ± 9.28	83.67 ± 10.88	0.734
Affected side	Right	14 (46.7%)	19 (63.3%)	18 (60%)	0.387
	Left	16 (53.3%)	11 (36.7%)	12 (40%)	

Table 2. *Numeric rating scale in the studied groups.*

		Baseline	1 w	3 w	4 w	12 w	24 w
Group C (n = 30)	Median	7	5	4	3	2	0
	IQR	6-8	3.25-6.75	3-5	1-5	1-5	0-4
Group ESB (n = 30)	Median	7	4	4	2.5	1	0
	IQR	6-8	3-5.75	2-5	1-4	0-2.75	0-0
Group PVB (n = 30)	Median	7	4	3	1	0	0
	IQR	6-9	2-5	1.25-4	0-3.75	0-2	0-0
P value		0.908	0.001*	0.004*	0.040*	0.003*	0.048*
P1		0.762	0.035*	0.032*	0.043*	0.017*	0.036*
P2		0.874	< 0.001*	0.001*	0.006*	0.001*	0.022*
P3		0.677	0.102	0.054	0.305	0.283	0.569

*Significant change as *P* value < 0.05, P1: *P* value between group C and group ESB, P2: *P* value between group C than group PVB, P3: *P* value between group ESB and group PVB

Table 3. *Dose of pregabalin used (mg) in the studied groups.*

		1 w	3 w	4 w	12 w	24 w	Total
Group C (n = 30)	Mean ± SD	2100 ± 0	3517.5 ± 1154.8	1400 ± 928.3	7620 ± 8369.1	9886.7 ± 12117.3	24550.8 ± 21471.3
	Range	2100-2100	1575-4200	0-2100	0-16800	0-25200	3575-51450
Group ESB (n = 30)	Mean ± SD	2100 ± 0	2126.7 ± 1936.1	998.3 ± 994.6	4620 ± 7483.8	3852.5 ± 8610.7	13735 ± 17067.3
	Range	2100-2100	0-4200	0-2100	0-16800	0-25200	2100-50400
Group PVB (n = 30)	Mean ± SD	2100 ± 0	1740.8 ± 1866.3	630 ± 978.8	3493.3 ± 6785.7	2920 ± 7650.4	11870.8 ± 16114.9
	Range	2100-2100	0-4200	0-2100	0-16800	0-25200	2100-50400
P value		---	< 0.001*	0.011*	0.019*	0.013*	0.019*
P1		---	0.006*	0.025*	0.028*	0.046*	0.041*
P2		---	< 0.001*	0.008*	0.034*	0.017*	0.024*
P3		---	0.652	0.308	0.833	0.926	0.918

*Significant change as *P* value < 0.05, P1: *P* value between group C and group ESB, P2: *P* value between group C than group PVB, P3: *P* value between group ESB and group PVB

Table 4. *Dose of acetaminophen used (gm) in the studied groups.*

		1 w	3 w	4 w	12 w	24 w	Total
Group C (n = 30)	Mean ± SD	22.17 ± 6.12	18.67 ± 9.43	11.73 ± 11.07	40.97 ± 50.83	55.40 ± 74.06	153.83 ± 144.97
	Range	14-28	0-28	0-28	0-130	0-190	14-384
Group ESB (n = 30)	Mean ± SD	21.93 ± 6.30	9.33 ± 8.88	5.13 ± 6.08	19.33 ± 33.50	22.47 ± 44.81	78.53 ± 87.803
	Range	14-28	0-28	0-14	0-112	0-160	14-326
Group PVB (n = 30)	Mean ± SD	21.93 ± 6.30	8.63 ± 8.56	5.13 ± 6.08	46.10 ± 32.13	18.57 ± 42.02	69.30 ± 84.17
	Range	14-28	0-28	0-14	0-112	0-160	14-316
P value		0.986	< 0.001*	0.002*	0.035*	0.022*	0.006*
P1		0.988	< 0.001*	0.006*	0.030*	0.042*	0.024*
P2		0.988	< 0.001*	0.006*	0.045*	0.032*	0.010*
P3		1.000	0.951	1.000	0.953	0.960	0.943

*Significant change as *P* value < 0.05, P1: *P* value between group C and group ESB, P2: *P* value between group C than group PVB, P3: *P* value between group ESB and group PVB

Table 5. *Incidence of postherpetic neuralgia after 3 months and 6 months.*

Post-herpetic neuralgia	Group C (n = 30)	Group ESB (n = 30)	Group PVB (n = 30)
After 3 months			
Yes	12 (40%)	8 (26.7%)	6 (20%)
No	18 (60%)	22 (73.3%)	24 (80%)
P value	0.22		
After 6 months			
Yes	11 (36.7%)	4 (13.3%)	3 (10%)
No	19 (63.3%)	26 (86.7%)	27 (90%)
P value	0.019*		
P1	0.037*		
P2	0.015*		
P3	0.688		

*Significant change as *P* value < 0.05, P1: *P* value between group C and group ESB, P2: *P* value between group C than group PVB, P3: *P* value between group ESB and group PVB

Discussion

Severe acute pain is a risk factor for PHN that is significantly related. The importance of early management in alleviating zoster pain cannot be overstated. Even with appropriate pharmacological therapy, such as analgesics, antiepileptics, and antivirals, certain patients may experience insignificant relief of pain and may require further interventional treatments (11).

Although an ESB has been effectively utilized to alleviate acute HZ pain in one instance, its impact on chronic neuropathic pain remains unknown (12). There is currently inadequate evidence and a need for long-term research to determine the efficacy of ESBs on PHN prevention (13).

PVB has been reported using a variety of ways, including lack of resistance and "walking off" transverse processes (14), radiographic-guided block (15), nerve stimulation (16), and US-guided block (17).

PVB operates directly on the spinal nerve, together with the rami communicants, the dorsal ramus, and the sympathetic chain (18). Neuronal inflammation related to the acute incident may be reduced via the addition of steroid to the block as well as stabilizing membranes for C fiber transmission, resulting in analgesia by inhibiting nociceptive input transmission and preventing the establishment of ectopic neural discharge (19).

Although the ESB's mode of action is uncertain, one possibility is that it acts by blocking the dorsal and ventral rami of thoracic/lumbar spinal neurons. ESB has been utilized as an analgesic in the management of fractured ribs and other thoracic surgeries, as well as in the management of shoulder pain and other disorders involving the erector spinae muscle (20,21).

Consistent with our findings, Makharita et al (22) reported that pain score was significantly lower in the PVB group than in the placebo group at 3 and 4 weeks. But in disagreement with our results, the pain score was insignificantly different at 12 and 24 weeks.

Also, Aydın et al (13) found a significant and immediate pain control during HZ with a single injection in patients with acute pain and a continuous block in individuals with chronic pain. NRS was significantly lower at 3rd month.

Moreover, Wang et al (23) showed that NRS and the doses of rescue medications (tramadol and pregabalin) were significantly reduced at various time periods after therapy with 5% lidocaine in a total volume of 300 mL continuous thoracic PVB infusion.

In agreement with our results, Hacıbeyoğlu et al (24) demonstrated that NRS in the ESB group at the 24th hour, week 4, and week 12 was significantly lower compared to the baseline.

In our study, a dose of pregabalin and acetaminophen showed an insignificant difference among the studied groups at one week. The dose of pregabalin and acetaminophen at 3, 4, 12, and 24 weeks were significantly reduced in group ESB than in group C and in group PVB than in group C and was insignificantly different between group ESB and group PVB. The delayed reaction might be attributed to the combination of somatosensory and sympathetic blocking, as well as a therapeutic anti-inflammatory steroid impact on the dorsal root ganglion and distal section of the afflicted nerve. The nearer the local anesthesia and steroid are administered to the nerve injury, the more effective the treatment will be (19).

In agreement with our results, Makharita et al (22) revealed that the PVB group showed significant reduction in pregabalin consumption at weeks 1, 3, and 24. Also, total doses were significantly lower in the PVB group. But in disagreement with our results, consumption was insignificantly different at 12 and 24 weeks. Also, they revealed that the PVB group showed significant reduction in acetaminophen consumption at 1, 3, and 4 weeks. Also, total doses were significantly lower in the PVB group. But in disagreement with our results, consumption was insignificantly different at 12 and 24 weeks.

Also, Wang et al (23) showed that both pregabalin daily doses were significantly lowered at each time point after surgery in comparison to the preoperative baseline. Additionally, they demonstrated that tramadol (analgesic) daily doses were considerably lowered at each postoperative time point compared to the preoperative baseline.

Regarding persistent herpetic pain, Makharita et al (22) was in agreement with our results as they revealed that after 3 months, the PVB group had a lower incidence of PHN than the placebo group. This was an insignificant finding statistically speaking (11.4% vs 22.1%, respectively). After 6 months, the PVB group had a significantly lower incidence of PHN than the placebo group (5.7% vs 16.2%, respectively).

Regarding adverse events, Makharita et al (22) disagreed with our results and demonstrated that there were no major adverse cardiovascular episodes associated with PVB during or after the interventional procedures (bradycardia, hypertension, or vasovagal attack). Also, Aydın et al (13) concluded that all blocks proceeded without notable complications during or post the execution of ESB. There was no clinically obvious motor blockage in any of the individuals. Moreover, Wang et al (23) indicated that no adverse complications related to PVB. During the follow-up period, either group had hypotension, vascular puncture, bradycardia, pneumothorax, pleural puncture, catheter breakage, or vertebral nerve puncture. No individuals discontinued treatment due to unfavorable side effects.

In our study, both ESB and PVB were comparable in NRS for pain and consumption of analgesics. In agreement with our results, Gürkan et al (25) showed that there was a significant decrease in the ESB and PVB groups than in the control group, with no difference between the ESB and PVB groups for 24-hour morphine consumptions and for NRS for pain in any time interval in patients undergoing unilateral breast surgery for breast cancer under general anesthesia.

Also, in a retrospective cohort study done by Aoyama et al (26), they identified patients who received unilateral breast surgery under general anesthetic along with the inclusion of TPVB or ESB. Following ESB, both postoperative fentanyl use and pain ratings were similar to those following TPVB. There were no major issues associated with blocks. They (ESB and TPVB) offered equivalent postoperative analgesia for 24 hours after breast surgery in individuals. However, a dermatomal sensory blockage was less noticeable and narrower after ESB than following TPVB.

Also, Agarwal et al (27) comprised 80 female patients undergoing MRM who were between the ages of 18 and 70 years and had an American Society of Anesthesiologists (ASA) physical status of I or II. Patients in Group P got PVB, whereas those in Group E received ESB prior to general anesthetic induction. Both groups received 20 mL 0.5% ropivacaine.

The total dosage of emergency analgesia and the NRS for pain scores were similar in the postoperative period.

Moreover, El Ghamry and Fawzy (28) conducted a prospective, randomized, double-blinded study on 70 female adult patients undergoing modified radical mastectomy. 20 mL of 0.25% bupivacaine was administered to patients in 2 groups: group I (TPVB) and group II (ESB). Both groups consumed comparable amounts of morphine 24 hours post-surgery. No significant change in fentanyl use was reported intraoperatively. Additionally, regarding pain scores, no significant difference was reported between the 2 groups throughout the

course of the study's 24 hours. Pneumothorax occurred in 4 patients in TPVB group I. However, no significant difference between the 2 groups was found.

Our results were in contrast to Swisher et al (29). In their study, patients having non-mastectomy breast surgery, either unilateral or bilateral, were randomly assigned to receive a single injection of ESB or PVB (ropivacaine 0.5% with epinephrine; 20 mL unilateral or 16 mL/side for bilateral). Pain ratings and opioid usage were significantly greater in patients with ESBs than in those with PVBs. There were no block-related adverse reactions in any group. They found that PVBs offered greater analgesia and significantly decreased the need for opioids during non-mastectomy breast surgery.

The primary advantage of ESB over paravertebral or intercostal nerve blocks is the lesser risk of mechanical problems such as nerve injury, pleural puncture, or vascular puncture. An ESB is practically simpler to conduct because it eliminates the need for repeated injections in the intercostal nerve block.

Further studies in multiple centers are needed to generalize our results and in a larger sample to show the significant differences in side effects. Additional research is required to establish the function of ESPB catheter placement in chronic pain associated with HZ. Additional research is required to elucidate the significance of repeating blocks as Ji and his coworker (30) and Makharita and Amr (31). Further studies are needed to compare with other types of blocks, such as stellate ganglion block, as Makharita and his colleagues (32) demonstrated a 6.5% incidence after 3 months and 0% after 6 months with the application of 2 sequential fluoroscopy-guided stellate ganglion blocks one week apart of each other earlier in the course of facial herpes zoster.

Conclusions

Both PVB and ESB were effective in controlling acute pain and persistent herpetic pain after 6 months (which was evident by lower NRS for pain, dose of pregabalin, and dose of acetaminophen), but ESB is safer (no replied pneumothorax and hypotension).

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