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Original Article

Erector Spine Block Vs Para Vertebral Block Under USG Guided For Post Herpetic Neuralgia: A Prospective Observational Study

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Abstract

Background

Severe zoster-associated pain limits patient's daily activity and may significantly lower the patient's quality of life. Ultrasound-guided erector spinae plane (ESP) blocks are used for a wide variety of indications in the management of acute, chronic, and postoperative pain.

Aim: Our aim was to evaluate the efficacy of ultrasound-guided erector spinae plane blocks and Para vertebral for the management of post herpetic neuralgia.

Methods: This study was carried out on 40 patients between 18 and 60 years old suffering from acute thoracic HZ. Patients were randomly classified into two groups: one group 1 received ESPB, using 0.2% ropivacaine (20 ml volume) and Patients who received a Para vertebral nerve block constituted Group II. All patients received standard medical care. The pain score, the consumption of pregabalin and analgesics, the incidence of complications, and the patient's satisfaction were measured and recorded.

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 II. 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 II. 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 than in group II (P = 0.036 and 0.016, respectively) without significant difference between group I and group II.

Conclusion: Ultrasound-guided erector spinae plane (ESP) block in conjunction with medical treatment can be beneficial in decreasing pain intensity in patients with acute pain due to herpes zoster more rapidly than conventional medical treatment. It leads to a significant decrease in pain score and analgesic requirements.

Keywords: Herpes zoster, Post-herpetic neuralgia, erector spinae plane block, lumbar, pain score, pregabalin, Analgesia.

INTRODUCTION:

Pain caused by herpes zoster often limits a patient's daily activity and may significantly affect the quality of life [1]. It is therefore necessary to effectively treat the herpes-associated pain.

Herpes zoster is caused by the reactivation of latent varicella-zoster virus. Acute severe pain and post-herpetic neuralgia (PHN) is a feared complication of herpes zoster infection. The reported incidence of PHN varies between 5% and 50% depending on the study design, age distribution, and definition [2-4]. Treatment of pain in the acute phase of herpes zoster has great importance due to the possible development of PHN. The pain may be severe, persist for months or years, interfere with sleep, and affect the quality of life. Acute and chronic postherpetic pain is challenging to manage which may require interventional regional analgesia methods in addition to conventional medical therapy [5,6].

A variety of interventional procedures have been described for the treatment of refractory pain, including intercostal nerve blocks, thoracic paravertebral blocks, epidural steroid injections, thoracic sympathetic blocks, pulsed radiofrequency ablation of the dorsal ganglion, and spinal cord stimulation.[7,8] But most of these procedures are contraindicated in patients on anticoagulants.

Ultrasound (US)-guided erector spinae plane (ESP) block is one of the interfascial plane blocks that target the dorsal and ventral rami of the spinal nerves [9]. Although there is not sufficient evidence for the spread of local anesthetic to the ventral rami, recent anecdotal reports demonstrated effective postoperative analgesia after thoracic and lumbar surgeries affecting both the ventral and dorsal rami [10-12]. ESP blocks were also effective for pain relief in chronic thoracic pain, rib fractures, and pulmonary malignancy [13-15]. The ESP block has a clear and simple sonoanatomy, is easy to perform, and is well-tolerated by patients [10]. The single-shot injection technique or continuous analgesia with a catheter placement is possible. The block could be performed unilaterally or bilaterally, depending on the requirement of analgesia [10,14]. ESP blocks could potentially provide effective analgesia and might be a successful method in the treatment of the acute and chronic pain associated with herpes zoster. Our aim was to demonstrate the efficacy of the ESP block for the management of pain in acute herpes zoster and post-herpetic neuralgia. We hypothesized that pain might be significantly less than before, after the performance of ESP blocks in patients with herpetic pain.

METHODS:

This study was carried out at pain clinic of SMHS hospital which is one of the associated of Government Medical College Srinagar on 40 patients between the ages of 18 and 60 years old, ASA physical status I and II, admitted to Pain clinic in the Department of Anaesthesiology, complaining of moderate to severe pain due to herpes zoster. Informed written consent was signed by all patients after they had received a detailed explanation of the aim, advantage, technique, and potential hazards of the study.

Inclusion criteria included patients with moderate pain (VAS ≥4), less than five dermatomes affected, and patients coming > 3 months of rash eruption. Patients with ASA status III, IV, and V; patients with coagulation abnormalities, or with known allergy to methylprednisolone or bupivacaine; patients with serum creatinine ≥5 mg/dl; patients coming ≥3 months after rash healing; and those with chronic pain requiring analgesia were excluded from the study.

Patients were randomly classified into two equal groups. Group I received ultrasound-guided ESPB using 0.2% Ropivicane 20 ml plus 40mg of triamcinolone and Group II received ultrasound-guided para vertebral block using 0.2% Ropivicane 20 ml. The patient was placed in a sitting position, and a high frequency linear ultrasound transducer was placed in a longitudinal orientation 3 cm lateral to the thoracic spinous process corresponding to the affected dermatome. Three muscles were identified superficial to the hyperechoic transverse process shadow as follows: trapezius, rhomboid major, and erector spinae. An 8 cm 22 gauge block needle was inserted in a cephalad to caudad direction until the tip lies in the plane between the erector spinae muscle and the transverse process. This was seen as visible linear spread of the fluid upon injection.

The dose of Pregabalin was increased or decreased according to pain severity and patient's ability to tolerate its side effects. The duration of analgesia was considered the analgesia starting from the performance of the block until the first analgesic requirement or reporting a pain score of 4/10. The block was repeated after a 2-week interval if the VAS was found to be >6. Group II received medical treatment along with para vertebral block. Patients were followed up for a 3-month period, with visits after 2 weeks, 1 month, and 3 months from the initial visit.

Statistical analysis

Data were analyzed using the SPSS 21 (SPSS Inc., Chicago, IL, USA) package program. Continuous quantitative data were presented as number, mean ± standard deviation. The paired sample test was applied to non-parametric data for the statistical evaluation of repeated measurements. $P<0.05$ was considered significant.

Conflict of interest: Nil

Funding: Nil

RESULTS:

Twenty patients undergoing ESP block were identified as Group 1 and 20 patients
Undergoing Para vertebral block was identified as Group 2. Of the 40 patients, 28 (70%) were female and 12 (30%) were male. The mean age of the patients was in group I was 54.9±14.3 years and in group II mean age was 55.6±15.7, mean BMI was 26.8±3.9 in group 1 and in group II mean BMI was 27.2±3.7. There was no statistically significant difference between the groups in terms of demographic characteristics (Table 1).

Table 1: Demographic characteristics of groups

Variables	Group I	Group II	P Value
Age (Years)	48.8±18.7	51.9±19.2	>0.05
Gender M/F	4/16	8/12	>0.05
BMI (kg/m^2)	26.8±3.9	27.2±3.7	>0.05
Duration of symptoms	17.6±7.1	19.2±5.1	>0.05

M: Male; F: Female; BMI: Body mass index.

The baseline NRS was statistically comparable among the two groups (P = 0.462). The NRS was statistically significantly decreased in groups I as compared to group II (P < 0.05) at different time intervals (Table 2).

Table 2: The Numeric Rating Scale score in the studied groups.

Time	Group I	Group II	P Value
Before injection	**7 (6-8)**	**7(6-8)**	**0.562**
1st day	**2(1-5)**	**4(1-5)**	**<0.0002**
2nd day	**2(1-5)**	**3(1-5)**	**0.005**
3rd day	**2(1-5)**	**4(1-5)**	**0.003**
4th day	**2(1-5)**	**4(1-5)**	**0.0001**
5th day	**2(1-5)**	**4(1-5)**	**<0.0001**
6th day	**2(1-4)**	**4(1-5)**	**<0.0001**
7th day	**2(1-3)**	**2(1-5)**	**0.174**
2 weeks	**2(1-4)**	**2(1-4)**	**0.650**
3 weeks	**2(1-4)**	**2(1-4)**	**0.563**
4 weeks	**2(1-3)**	**2(1-3)**	**0.821**
6 weeks	**2(1-3)**	**2(1-3)**	**0.542**
8 weeks	**2(1-2)**	**2(1-2)**	**0.456**
10 weeks	**1(1-3)**	**1(1-3)**	**0.643**
12 weeks	**1(1-3)**	**1(1-3)**	**0.895**

The pregabalin mean daily dose consumed during the whole period of follow-up was significantly decreased in groups I as compared with group II (P < 0.05) (Table 3).

Table 3: The mean daily consumption of pregabalin

Time	Group I	Group II	P Value
2nd-3rd week	**244.00±50.88**	**284.00±37.42**	**0.005**
3rd-4th week	**191.00±45.18**	**250.00±59.51**	**0.0001**
4th-6th week	**172.00±41.15**	**228.00±63.06**	**0.0002**
6th-8th week	**148.00±43.68**	**200.00±72.17**	**0.0028**
8th-10th week	**122.00±46.87**	**169.00±67.08**	**0.0018**
10th-12th week	**85.00±38.76**	**124.00±51.27**	**0.0017**

Furthermore, the acetaminophen mean daily dose consumed during the follow-up period was significantly increased in group II in comparison with groups I (P < 0.05) (Fig 1).

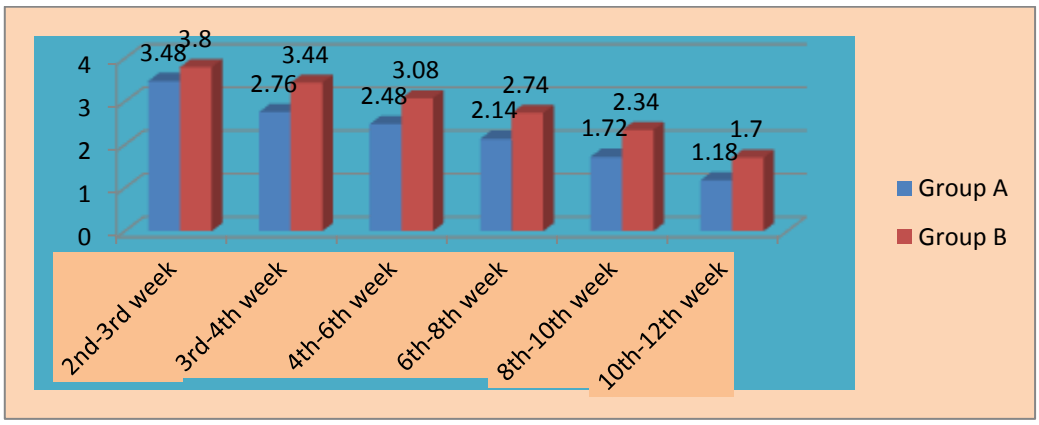

Fig 1.

There was a statistically significant difference in the level of patient satisfaction at 3 months of follow up in the 2 groups (P = 0.03). The patients in group I were more satisfied than those in group II (P <0.05) (Fig 2).

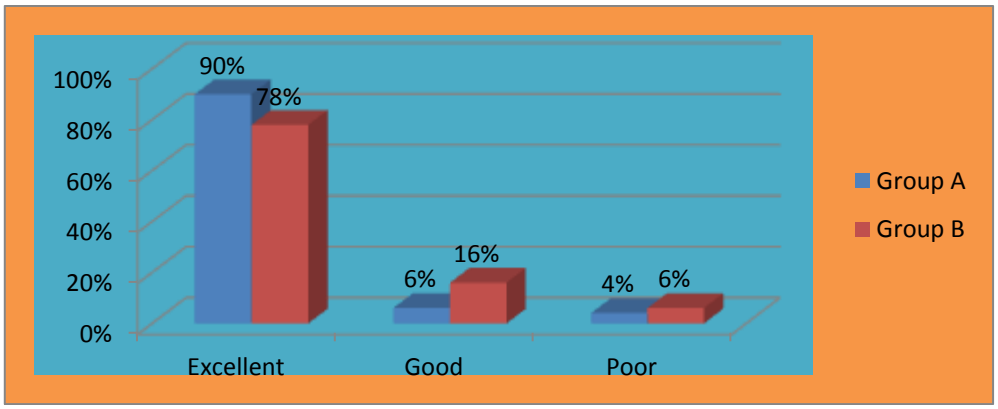

Fig 2.

All blocks were uneventful and no remarkable complication occurred during and after the performance of the blocks. No clinically apparent motor blockade was observed in any of the patients.

DISCUSSION:

The results of the current study reported a greater decrease in pain intensity in patients who received ultrasound guided ESPB than in patients who received Para spinal block with more patient satisfaction and less drug intake, earlier in the course of treatment.

The virus remains dormant within the dorsal root and cranial nerve ganglia following the primary infection caused by the varicella-zoster virus. Herpes zoster infection occurs due to the reactivation of the primary infection, resulting in typical dermatomal pain and vesicular rash. Postherpetic neuralgia is defined as pain resuming for 12 weeks following the re- activation of the virus.[16] The pain can be intermittent or constant and is typically described as burning, stabbing, or shooting, which may have a severe impact on the quality of sleep and life. Being over the age of 60 and female sex are risk factors for PHN.[17] Compatible with the literature, 70% of the patients included in our study were females.

The ESP block is an interfascial regional analgesic technique that was described initially by Forero *et al*.[18] in 2016, to treat thoracic neuropathic pain. It consists of an USG guided local anesthetic injection in a plane between the erector spinae muscle and the underlying transverse process. The ESP block is easy to perform and to learn the technique with unique features compared to other interfascial blocks. The target point is a bone structure making the block execution really safe. The ESP block mimic paravertebral block. Even though the mechanism of action is not well established, several studies have shown the involvement of ventral and dorsal rami of spinal nerves by local anesthetics.[19,20] This technique became popular soon in managing various acute and chronic pain due to its relative simplicity of performance and efficacy. This block has been adapted for acute and chronic pain control with ease and low complications for a variety of surgeries and conditions including spine surgery, breast surgery, limb amputation, video assisted thoracoscopic surgery, rib fractures, PHN, complex regional pain syndrome, cardiac surgery, laparoscopic and open abdominal surgery, and hip surgery.[19] ESP blocks were also effective for pain relief in chronic thoracic pain, rib fractures, and pulmonary malignancy.[17,21] In one study they used the ESP block single shot technique and catheter placement for acute and chronic herpetic pain respectively and they reported adequate analgesia for 3 months.[22] ESP block has been reported as useful in control of acute herpes zoster pain in emergency department.[23] One case repotted the successful use of lumbar ESP block for management of PHN in a patient with chronic lymphocytic leukemia.[24]

The administration of ESPB in the acute phase of the disease resulted in lower pain scores 2 weeks after the block administration and 1 month after the onset of the disease. This is consistent with the findings of Aydin et al. [25] and Balban et al. [26] who found a decrease in pain scores after administration of ESPB.

One advantage of this technique is that it provided analgesia that lasted 24–48 hours after the block and decreased the pain intensity after that. Fourteen patients (70%) required a second block 2 weeks after the first block was administered.

Another advantage of ESPB is that it is a relatively safe technique with a lower risk of complications such as nerve damage or pleural puncture.
Severe acute pain is one of the factors that was found strongly associated with an increased risk of post-herpetic neuralgia [27]. Early intervention is important for resolving zoster pain. Even with adequate medical treatment using antiepileptics, analgesics, and antivirals, some patients do not have sufficient pain relief and may need additional interventional procedures. Various nerve blocks are found to provide effective analgesia and prevent progression to post-herpetic neuralgia by decreasing the painful stimuli and alleviating central sensitization during the acute phase of herpes zoster infection [28].

There was a significant decrease in the average consumption of Pregabalin and Acetaminophen in the patients who received erector spinae block compared to those with conventional medical treatment. In concordance with our study, Makharita et al. [29] found that patients who received paravertebral injections for acute herpes zoster had less consumption in analgesics than prior to receiving the block. Cui et al. [30] also found a significant decrease in analgesic consumption per week compared with the values of the first week.

Limitations
There are several limitations of this study, starting from the small sample size, the short duration of follow-up period, difficulty in follow-up with the patients, and frequent dropouts.

CONCLUSION:

Ultrasound-guided ESPB using local anaesthetic can be a useful technique for early control of pain in the acute phase of herpes zoster. However, further studies can be conducted to assess its efficacy in preventing PHN with multiple blocks.

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