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Role Of Erector Spinae Plane Block in Acute Pain Management and Incidence of Post Herpetic Neuralgia With or Without Local Anesthetics. A Comparative Study

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ABSTRACT
Background and Aims: *Erector spinae block being safer and easier. Use of this block may decrease acute pain severity and incidence of Post herpetic neuralgia in herpes zoster infection.*
Aims: Evaluation of erector spinae plane block in pain management in herpes zoster infection when given with or without local anesthetic and steroids.
Methods: *Total 150 adult diagnostic cases of acute herpes zoster affecting lumber and chest were selected for the study. Patients were randomly divided into two groups for erector spinae block. The active group received ESP Block with 10 ml of 30mg bupivacaine plus 8mg dexamethasone and placebo group received ESP block with 10 of normal saline. All patients received standard medical treatment. The duration of eruptive phase, pain scores (VAS), rescue analgesia, incidence of post herpetic neuralgia and sleep interference scale (SIS) were reassured and recorded.*
Results: *The characteristics of the two groups were comparable in terms of age, weight, gender. The complete resolution of eruption phase of active group was significantly shorter in active group 19.4±2.5 days as compared to 28.20±4.4 days in placebo group ($p < 0.0001$). In placebo group, 58 patients took rescue analgesia (66.6%) as compared to only 24 patients (32.0%) in active group ($p=0.0002$). The VAS score were lower and statistically significant in active group at 1 week, 2 week and 4th week as compared to Placebo group ($p<0.0001$). The percentage of post herpetic neuralgia cases at 3rd month were lower in active group as compared to placebo group ($p<0.0005$). Sleep interference scale (SIS) scores were significantly lower in active group as compared to placebo group 2nd week.*
Conclusion: *Early single ESP block in acute herpes zoster seems to be a safe and effective. It leads to a significant decrease in pain scores and analgesic requirement with improved sleep quality.*
Key words: *herpes zoster, ESP block, Post herpetic neuralgia*

I. INTRODUCTION

Herpes zoster infection is the reactivation of herpes simplex infection. Symptoms of herpes zoster infection are classified into three stages [1, 2, 3]. Preemptive phase: when virus spreads in sensory ganglion into sensory nerve endings and usually patients present with unilateral burning and inching without rash. It lasts 1-3 days. Eruptive phase: patients present with pain and burning sensation in specific dermatomes fallowed by rash and vesicles. Chronic phase: in some patients pain persistent at nerve endings for more than 3 months after resumption of acute phase and is called post herpetic neuralgia and in some patients this pain persists throughout their life and have severe impact on quality of life [2]. Various drugs and interventional pain methods have been used to reduce acute symptoms and post herpetic neuralgias [4]. Newer interventional nerve blocks methods like paravetebral block, erector spinae plane block and pulsed RFA for herpes zoster showing promising results for both acute pain management and reduction of incidence of post herpetic neuralgia cases. Erector spinae plane block being practically easy and safe with fewer complications as compared to other interventional blocks [5, 6, 7, 8, 9]. In this study, our primary aim was to evaluate the effect of erector spinae plane block on eruptive phase of diagnosed cases of herpes zoster patients and impact on sleep pattern. Our secondary aim was to know the role of erector spinae pane block on incidence of post herpetic neuralgia.

II. MATERIAL AND METHODS

After a written consent for interventional block, 150 adult patients with diagnosed cases of acute herpes zoster affecting lumber and chest were selected for the study. The inclusion criteria were patients with herpetic skin eruption in chest and lumber region with history of less the one week. Patients with history of diabetes mellitus, renal disease, hepatic disease, patient on anticoagulants' or any bleeding disorder, patients with

malignancy, infection at site of needle insertion, patients with VAS score less than 3 were excluded from study. During patients clinic visit, detailed medical history and clinical examination was performed by pain specialist having experience in pain medicine more than 5 years. All patients were explained about interventional pain block and follow-up. The time of the block (the day patients received their block in relation to appearance of their rash and confirmation of the diagnosis of acute herpes zoster) was also recorded. Patients were randomly assigned to receive either erector spinae plane block under fluoroscopy guided block using either 30 mg bupivacaine (0.5%) plus 8 mg dexamethasone in a total volume of 10 ml or to receive 10 ml normal saline as placebo under fluoroscopy guided block. The pain specialist unaware about drug preparation and group allotment was appointed to give blocks and same pain specialist also checked patients in clinic follow up. Drug preparation and Data collection was done by another pain specialist. The level for erector spinae block was selected in view of the affected dermatomes. The patients were monitored in the recovery room for 2 hours. Pain score after 1 hour was assessed and recorded by the recovery room nurse who was not aware of the study protocol. All patients received pregabalin in a dose of 150 mg twice daily and antiviral drugs acyclovir 400 mg four times a day for 2 weeks. Acetaminophen and tramadol was given as rescue analgesia if VAS > 4. Patients were evaluated for pain severity using visual analog scale (VAS), (10-cm unmarked line, with anchors: 0 = no pain and 10 cm = worst pain imaginable) before the block (baseline), then weekly for 1 months, and at 2nd month, 3rd month. At each assessment visit, the total number of patient who took rescue analgesia was recorded. The time of complete resolution of skin eruption (identified by drop of last crust) were recorded. The incidence of persistent herpetic pain after 3 month reported as PHN. The effect of pain on sleep was measured by using Sleep interference scale (SIS) scoring in which '0' means no interference and '10' means unable to sleep due to pain.

Data were presented as median (range), mean symbol +/− SD frequencies, as appropriate. Nominal patient's characteristics were compared using the Fisher's exact test. A Bonferroni correction was applied for multiple two-way testing. In all categories, $P < 0.05$ was considered statistically significant. Pulse and blood pressure were compared using multiple comparison test (Dennett test), $q > 2.740$ considered statistically significant ($P < 0.05$). InStat statistical software

was used for statistical analysis (GraphPad Software, Inc, USA).

III. RESULTS

The characteristics of the two groups were comparable in terms of age, weight, and gender (Table 1). The complete resolution of eruption phase of active group was significantly shorter in active group 19.4±2.5 days as compared to 28.20±4.4 days in placebo group ($p < 0.0001$) which was statistically significant. In placebo group, 58 patients took rescue analgesia (66.6%) as compared to only 24 patients (32.0%) in active group, which was also statistically significant (p=0.0002).

TABLE1 : Demographic characteristics				
	Placebo group	Active group	P value	significance
Age in years	52.5± 16.3	54.1±14.4	0.4375	NS
Sex (M/F)	40/30	38/32	0.0562	NS
Weight (kg)	60.2±20.5	59.3±16.6	0.7257	NS
Duration of eruption	28	19	<0.0001	S
Rescue analgesia	58/70 (66.6%)	24/75 (32.0%)	0.0002	S
Values are expressed as mean ± SD , numbers or percentage (%) , NS=nonsignificant, S= significant				

The baseline VAS score of both groups were comparable in both groups (>0.05) (Table 2). But after giving block, the VAS score were lower and statistically significant in active group at 1 week, 2 week and 4th week as compared to Placebo group (p<0.0001). Even at the end of 2nd month after block the VAS scores were lower in active group as compared to placebo group (<0.0005). The percentage of post herpetic neuraaalgia cases at 3rd month were lower in active group as compared to placebo group (p<0.0005).

Table 2: VAS SCORE				
	Placebo group	Active group	P value	significance
Baseline	8.1±1,2	7.9±1.2	0.3259	NS
1st week	5.3±1.3	1.6±0.6	<0.0001	S
2nd week	4.7±.1.6	1.2±1.0	<0.0001	S
4th week	3.8±1.5	0.7±1.2	<0.0001	S
2 months	1.6±1.2	0.2±1.1	<0.0001	S

3 month	0.7±1.2	0.2±1.6	0.0585	NS
Values are expressed as mean ± SD , numbers or percentage (%) , NS=nonsignificant, S= significant				

Sleep interference scale (SIS) scores measured in every visit at clinic was non significant in 1 week and 2nd week but after that SIS scores were lower in active group as compared to placebo group which was statistically significant. Neither patient in either group reported any complication related to block (table 3).

Table 3 : SIS score				
	Active group	Placebo group	P value	significance
1week	5.2±1.1	5.0±1.2	0.3275	NS
2 week	3.4±2.3	2.6±0.4	0.0333	NS
3rd week	2.7±0.7	1.1±0.2	<0.0001	S
4th week	1.5±0.3	1.0±0.3	<0.0001	S
Values are expressed as mean ± SD , numbers or percentage (%) , NS=nonsignificant, S= significant				

IV. DISCUSSION

Understanding acute herpes zoster pain is very important and if managed poorly, this pain can progress into post herpetic neuralgia. The post herpetic neuralgia has severe negative impact on quality of life like poor sleep, chronic fatigue syndrome, inability to routine work, anxiety and depression. The standard treatment for acute herpes zoster involves antiviral therapy (AVT) aimed at reducing viral replication and minimizing the severity of the rash. However, AVT alone does not provide significant pain relief, nor does it effectively reduce the risk of developing post herpetic neuralgias (PHN). Now days, interventional pain blocks have proved very successful in pain management of acute herpes zoster and post herpetic neuralgia. The various interventional blocks giving for pain management in herpes zoster related pain like intercoastal nerve block, epidural block, sympathetic ganglion chain block, pulsed radiofrequency ablation and recently new blocks paravetebral block and erector spinae plane block. But timing is crucial, early intervention is more effective for preventing acute pain and PHN in herpes zoster related pain. In this study, we performed erector spinae block over to paravetebral block because erector spinae plane block is practically safe, easy to perform and having less complications as compared to other blocks including paravetebral block. Our main primary aim was to evaluate the effect of erector spinae plane block on acute eruptive phase of herpes zoster and prevention of post herpetic neuralgias.

In this study, we demonstrated that patients who received bupivacine in erector spinae plane block shortens the duration of eruptive phase of herpes zoster and pain scores at all clinic visits. The number of patients who took rescue analgesia was significantly lower in active group as compared to placebo group. In this study we also demonstrated that ESP block is an easy and relatively safe procedure. SIS scores were lower in active group after 2 week as compared to placebo group. In our study, we also found that incidence of post herpetic neuralgias after 3rd month were significantly lower in active group as compared to placebo group. Our results corresponds the study of **Tayfun Aydin and his coworker** [10] In their observational study, they investigated medical record of 34 acute herpes zoster patients who received ESP block at two pain clinic centers and demonstrated that an ESP block provided sufficient analgesia in acute herpetic pain. A combination of ESP block, pregabalin, and tramadol were effective within the three-months-period after the block performance. Similarly, **Alexandre Yamada and coworkers [11]** performed a systemic review and met analysis study to evaluate the efficacy of the erector spinae plane block in 360 diagnostic cases of acute herpes zoster . They found that erector spinae plane block significantly reduces pain up to eight weeks and incidence of PHN. ESP block also reduced acetaminophen and gabapentin consumption over 12 weeks. Quality of life was better in ESP block patients. In another comparative study of ‘’Ultrasound-Guided Erector Spinae Block Versus Ultrasound-Guided Thoracic Paravertebral Block’’ **by Esraa et al** [12] for pain relief in 90 patients of acute thoracic terpes zoster. In this comparative study, they found that both ESP block and paravetebral were effective in controlling acute pain and persistent herpetic pain up to 6 months which was evident by lower pain score and lower doses of gabapentin and acetaminophen. Similarly, **Mai Ahmed and colleagues** [13] in a study to know the Role of ultrasound guided erector spinae plane block in management of acute herpes zoster pain and incidence of post-herpetic neuralgia and they found that Pain intensity was significantly lower in the active group at the second and fourth weeks after the block was performed. The time to complete resolution of pain was significantly longer in the medical group. Patient’s progression to PHN in the active group was 10% vs. 30% who received medication only. The average gabapentin and acetaminophen doses were significantly lower in the block group. Patient satisfaction was significantly higher in patients in the block group at the second and fourth weeks after

the receiving the block. **Akkamahadevi patiel and colleagues [14]** in their comparative study of ESP block and paravetebral block (PVB) to evaluate the role of these blocks in the prevention of post herpetic neuralgias (PHN) in acute herpes zoster patients and they found that the incidence of PHN was 45% in the ESP block group and 40% in the PVB group and 80% in the control group who received medication only (p = 0.022). The proportion of patients with pain relief was higher among the paravetebral group compared to the ESP block group but statistically non significant (p 0.749). In another study by **Gulcin and co- authors [15]** compared intercostal block with ESP block in acute herpes zoster patients. And they demonstrated that pain scores and sleep interference scale (SIS) scores were significantly better in ESP block as compared to intercostals block.

In conclusion, a single erector spinae plane block using local anesthetic, steroid, in combination with appropriate antiviral therapy applied early in the course of acute thoracic herpes zoster, is a safe and effective treatment modality. It shortens the duration of pain, skin eruption, reduces the incidence of post herpetic neuralgias and improves quality of sleep as compared to patients who receives medication only.

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