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Original Article

Efficacy of Modified Jaipur Block in Post Herpetic Neuralgia

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ABSTRACT

Post herpetic neuralgia (PHN), a chronic neuropathic pain arising after herpes zoster (shingles) infection is notable, if discomfort persists beyond 90 days from the initial outbreak. **Objective:** To determine the efficacy of Modified Jaipur Block in reducing pain in patients with Post Herpetic Neuralgia. **Methods:** An uncontrolled clinical trial at Sheikh Zayed Hospital, Rahim Yar Khan, from January 2023 to September 2023 included 103 post herpetic neuralgia patients aged 20-80 years. Pain severity assessed using VAS score at baseline and follow-ups; efficacy defined as >75% decrease in VAS pain score at 6 months. Statistical analysis utilized SPSS 26.0, employing paired t-tests and Chi-square tests for efficacy and subgroup analyses. **Results:** In 103 patients predominantly aged 51-65 years and suffering mainly from thoracic pain, the Modified Jaipur block treatment yielded substantial reductions in Visual Analogue Scale (VAS) scores. From an initial mean VAS of 8.15±1.389, scores declined significantly to 2.66±2.379 at the last follow-up ($p<0.001$). A notable 73.8% of patients achieved remission, while relapses were observed in 7.8%. No association between remission rates and demographic or clinical variables was detected ($p>0.05$). At the 6-month follow-up, 61.2% of patients demonstrated efficacy (over 75% reduction in VAS pain scores), with a significantly higher efficacy noted in cases of intermittent pain ($p<0.05$). **Conclusions:** The Modified Jaipur block treatment demonstrated significant efficacy in pain reduction. The study underscores the potential of this treatment modality for targeted pain management.

INTRODUCTION

Post herpetic neuralgia (PHN), a chronic neuropathic pain syndrome, emerges as a debilitating sequela of herpes zoster (shingles) infection. This syndrome becomes particularly relevant when zoster-related discomfort lingers beyond 90 days subsequent to the initial episode of herpes zoster. It is primarily associated with compromised cellular immunity and age-related decline in varicella-zoster virus (VZV) immunity [1]. Clinically, patients suffering from this condition exhibit a range of pain phenotypes, such as constant aching, paroxysmal lancinating pain, allodynia, and hyperalgesia, significantly impacting health-related quality of life (HRQOL) [2]. The epidemiological data reveals an estimated overall incidence of herpes zoster between 3.4 to 4.82 cases per 1,000 person-years, increasing to 11 cases per 1,000 person-years in individuals aged 80 years and above [3]. A local study further substantiates this, reporting a 12.7% prevalence rate of PHN among herpes zoster patients [4]. The etiology of PHN is complex, with an interplay of risk factors that includes age, severity of the acute phase, immunological status, and presence or absence of comorbid conditions such as diabetes. It is believed that the biological underpinning of PHN lies in the inflammatory response localized to the dorsal root ganglion and associated peripheral nerves [1-5]. Management strategies for PHN are diverse, encompassing both

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pharmacological and interventional therapies. Oral anticonvulsants such as gabapentin and pregabalin and tricyclic antidepressants like amitriptyline and nortriptyline are frequently employed as first-line treatments [6]. Moreover, localized treatments including capsaicin cream and lidocaine patches provide symptomatic relief [7]. For refractory or severe cases, invasive interventions like nerve blocks and corticosteroid injections have been considered [8, 9]. Within the extensive landscape of treatment modalities for Post herpetic Neuralgia (PHN), the Modified Jaipur block, a composite of 2% lignocaine, 0.5% bupivacaine, and dexamethasone (4mg) has been introduced for targeted pain management [10-12]. The individual constituents of this block have distinct mechanistic roles in pain management. Lignocaine, a local anesthetic, acts by blocking sodium channels, thus interrupting the pain signal at the neuronal level. Bupivacaine, another local anesthetic, is characterized by a longer duration of action, thereby providing sustained analgesic effects. Dexamethasone, a corticosteroid, confers anti-inflammatory benefits and enhances the duration of the local anesthetics. The combination, therefore, presents a multimodal approach to pain alleviation [13].

Given the complexity and often refractory nature of PHN, treatment options that employ a multi-mechanistic approach may offer enhanced efficacy. Given the limitations and adverse effects associated with existing therapies, this study aimed to investigate the efficacy of Modified Jaipur block in the treatment of Post herpetic Neuralgia, to contribute to the growing body of literature advocating for personalized and effective therapeutic interventions.

METHODS

An Uncontrolled clinical trial was conducted from January 2023 to September 2023 at Sheikh Zayed Hospital's dermatology department, Rahim Yar Khan, following approval from the institutional review board (IRB/SZMC/SZH/594). A sample size of 114 was determined with a 95% confidence level, targeting a 60% Efficacy rate to Modified Jaipur Block treatment [14]. Sampling was done through non-probability consecutive sampling technique. Written informed consent was obtained from each participant after explaining the potential benefits and hazards of this trail. Out of 114 patients, 11 were lost to follow-up, resulting in a final analytical set of 103 patients. Patients aged 20-80 years, with a clinically confirmed diagnosis of Post herpetic Neuralgia (PHN) based on persistent pain lasting for more than three months after the acute blistering rash of herpes zoster had resolved, and evidence of ophthalmic, thoracic, or lumbar dermatomal involvement, were included in the study. Inclusion also necessitated a lack of therapeutic response to pregabalin or gabapentin for at least one month, a Visual Analogue Scale (VAS) score of ≥4, and the cognitive ability to provide informed written consent. Exclusion criteria included HIV positive patients, known hyper sensitivities to lignocaine, bupivacaine, or dexamethasone, glaucoma in cases of ophthalmic dermatomal involvement, clotting disorders, current anticoagulant use, bacterial skin infection, cardiac arrhythmias, and unwillingness to comply with the study's follow-up and treatment modalities. Data were collected on patients' demographics, pain duration, and character, divided into continues, intermittent and provoked. Pain severity was evaluated using the Visual Analogue Scale (VAS) score, with a calibration range of 0-10 cm, at baseline and subsequent follow-ups [15]. In this study, we modified the Jaipur block by reducing the steroid dose. Initially, it contained 2% lignocaine, 0.5% bupivacaine, and 8 mg of dexamethasone [16]. We aseptically prepared a Modified Jaipur block solution with 6 mL of 2% lignocaine, 5 mL of 0.5% bupivacaine, and 4 mg dexamethasone [17]. The steroid dose was reduced to minimize potential side effects while maintaining the efficacy. Sterile syringes were utilized for administration. Targeted dermatomes were meticulously identified through clinical evaluation, visual inspection, and patient feedback, further verified by a Pinprick test to map sensory alterations. The dermatome was partitioned into a grid pattern to delineate optimal injection sites. Distances between sites were maintained at 1.5-2 cm. Subcutaneous injections were administered using a 25-gauge needle at a depth of 3-5 mm. A uniform volume of 0.5 ml of the solution was delivered at each site, adhering to the upper limit of 4 mg/kg body weight for local anesthetics. Post-injection, a 30-minute observation period was implemented to monitor for adverse reactions. Total three sessions were done at 4 weeks interval. VAS scores were re-assessed at intervals: 4 weeks after each of the first, second, and third injections, and at a 6-month follow-up. The drop in VAS pain scores at each visit was measured, and improvement was Graded on a 0 to 4 scale: 0 for no change from baseline VAS pain score, 1 for less than 25% improvement, 2 for a 25%-50% improvement, 3 for a 50%-75% improvement, and 4 for more than 75% improvement. Efficacy was defined as achieving more than a 75% reduction in pain, as measured by the Visual Analog Scale (VAS), from baseline at the 6-month follow-up. Remission was defined as a VAS pain score of 2 or lower from the third to the sixth-month follow-up. A rise in the pain score by 2 points between the third and sixth-month follow-up was considered a relapse [17]. Statistical analysis was executed using SPSS version 26.0. Descriptive statistics summarized demographic and clinical data. Paired t-tests compared pre- and post-intervention VAS

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scores to assess the efficacy of Modified Jaipur block treatment. Graded improvement and remission rates were also examined for significance. Subgroup analyses, based on dermatome involvement, pain character, and duration, were conducted to identify predictors of treatment efficacy. Chi-square tests compared remission and relapse rates across subgroups. A p-value <0.05 was considered statistically significant.

RESULTS

Among the 103 patients studied, the majority were male (59.2%) and fell within the age group of 51-65 years (36.9%), with an average age of 51.76±14.173 years. Most patients (35.9%) had been experiencing pain for 7-12 months. The predominant type of pain reported was intermittent (46.6%), and the most commonly affected dermatome was the thoracic region (68.0%) (Table 1).

Table 1: Baseline demographic and clinical detail of 103 patients

Baseline characteristics	Frequency	Percent (%)
Gender		
Male	61	59.2
Female	42	40.8
Age Group		
20-35	15	14.6
36-50	31	30.1
51-65	38	36.9
66-80	19	18.4
Duration of Pain		
20-35	24	23.3
36-50	37	35.9
51-65	28	27.2
66-80	14	13.6
Type of Pain		
Persistent Pain	29	28.2
Intermittent Pain	48	46.6
Provoked Pain	26	25.2
Dermatome Involvement		
Ophthalmic	26	25.2
Thoracic	70	68.0
Lumbar	7	6.8

There was a significant decline in VAS scores over the treatment period. The initial mean VAS score was 8.15±1.389, which dropped to 5.89±1.501 at the first follow-up. Further reductions were noted at subsequent follow-ups: 5.08±1.661 at the second and 4.07±1.635 at the third. At the final follow-up, the mean VAS score was substantially reduced to 2.66±2.379. The Modified Jaipur block treatment led to statistically significant reductions in mean VAS scores across multiple follow-ups, with the largest mean difference of 5.485±2.380 observed between baseline and the last follow-up. All changes were significant with p-values <0.001 (Table 2).

Table 2: Comparison and difference between baseline and follow-up VAS score. (n=103)

Comparison of baseline and follow-up VAS pain score	Baseline VAS Score (Mean ± SD)	Follow-up VAS Score (Mean ± SD)	Difference in VAS Score (Mean ± SD)	p-value
Baseline versus 1st Follow-up	8.15±1.389	5.89 ± 1.501	2.252 ± 1.582	<0.001
Baseline versus 2nd Follow-up	8.15±1.389	5.08 ± 1.661	3.068 ± 1.756	<0.001
Baseline versus 3rd Follow-up	8.15±1.389	4.07±1.635	4.078 ±1.707	<0.001
Baseline versus Last Follow-up at 6th month	8.15±1.389	2.66 ± 2.379	5.485 ± 2.380	<0.001
3rd Follow-up versus Last Follow-up	4.07±1.635	2.66 ± 2.379	1.408 ± 1.354	<0.001

Sixty-three subjects (61.2%) reported efficacy i.e., Grade 4 improvement (>75% reduction in VAS pain score) at the final follow-up, while two (1.9%) demonstrated Grade 0 improvement at the same time point. It was observed that the rate of higher-grade improvements increased with each successive follow-up or injection treatment. Remission was observed in 76 cases (73.8%), while relapse was noted in 8 cases (7.8%). No significant associations between these treatment outcomes and variables like age group, gender, duration of pain, type of pain, or dermatome involvement were found ($p > 0.05$). The highest frequency of Grade 4 improvement was observed in cases with intermittent pain (29 out of 48 cases), while the lowest frequency of Grade 4 improvement was found in cases with persistent pain (19 out of 29 cases). The association between the type of pain and the grade of improvement was statistically significant, as evidenced by a p-value less than 0.05 (Table 3).

Table 3: Improvement Grades Across Multiple Follow-ups in Study Participants (n=103)

Improvement Grade	1st Follow-up (n=103)	2nd Follow-up (n=103)	3rd Follow-up (n=103)	Last Follow-up (n=103)
Grade 0	15 (14.6%)	9 (8.7%)	0 (0%)	2 (1.9%)
Grade 1	31 (30.1%)	11 (10.7%)	14 (13.6%)	7 (6.8%)
Grade 2	41 (39.8%)	52 (50.5%)	18 (17.5%)	16 (15.5%)
Grade 3	16 (15.5%)	31 (30.1%)	61 (59.2%)	15 (14.6%)
Grade 4	0 (0%)	0 (0%)	10 (9.7%)	63 (61.2%)

DISCUSSION

In the current investigation, the majority of patients fell within the age group of 51-65 years, constituting 36.9% of total patients. A predominance of males was observed, accounting for 59.2% of the study participants. The most frequently reported duration of pain was 7-12 months, encompassing 35.9% of cases. Concerning dermatomal involvement, the thoracic region was the most commonly affected, with 68.0% of patients experiencing pain in this area. These findings offer valuable insights into the demographic and clinical characteristics of the population under study. While focusing on the outcomes of Modified Jaipur block treatment, a significant decline in Visual

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Analogue Scale (VAS) scores was observed in the present investigation, affirming the treatment's efficacy. The current study's findings align with those of Bhargava *et al.*, (1998) who reported an 85% response rate at 3 months and 96% at 4 months using Jaipur block [16]. In this study, remission was achieved in 73.8% of patients, and only 7.8% experienced a relapse. These results are also consistent with a study by Sharma *et al.* (2021) where 50% of patients showed excellent treatment response, a mere 1.9% showed no improvement, and 5.6% experienced relapse [17]. No significant side effects were observed in either study. Puri (2011) found 10% of patients to be poor responders, a figure higher than observed in this study . Ni *et al.* reported a 4% recurrence rate, lower than observed in this study [18]. Khalid *et al*. utilized a combination of xylocaine, bupivacaine, and dexamethasone in concentrations similar to our study, reporting an efficacy of 60.2% in patients at 12 weeks and 82% at 18 weeks. This is notably consistent with our observation of 61.2% efficacy at the final follow-up [19]. Amjad *et al.* (2005) reported efficacy in 63% after the first injection and 83.3% after the second [20]. The present study found no significant associations between VAS score reductions and key demographics, contrasting with Sharma *et al.*, who noted PHN of longer duration was less responsive. Persistent pain also showed reduced responsiveness, a finding warranting further research. Steroids like triamcinolone, when combined with local anesthetics, showed varied outcomes. Asim *et al.* (2016) noted better efficacy with triamcinolone than lignocaine alone [21]. Amjad *et al.* reported a 63% improvement with a 0.8 mg/mL triamcinolone-lignocaine mix [20]. Dexamethasone offers advantages such as preventing stinging and reducing crystallization risks. The study substantiates the efficacy of Modified Jaipur block in reducing pain, as measured by VAS scores. Further research should explore pain type's effect on outcomes and enlarge sample size for broader applicability. Strengths involve rigorous statistical analysis and insights into patient variables. Limitations include small sample size, brief follow-up, and absence of side-effect assessment. Future work should focus on these areas. Future research should aim for larger samples, extended follow-up, and a safety profile assessment for Modified Jaipur block treatment.

CONCLUSIONS

The Modified Jaipur block treatment demonstrated marked efficacy in pain reduction, as evidenced by statistically significant declines in mean VAS scores across multiple follow-up periods. High remission rates of 73.8% were also noted, with no discernible association between treatment outcomes and patient demographics or pain characteristics. These findings validate the Modified Jaipur block as a promising therapeutic option for pain management in PHN, although further investigation is warranted to corroborate these results.

Authors Contribution

Conceptualization: NA
Methodology: NA
Formal analysis: NA, MKS, TH, NH
Writing-review and editing: NA, AN, SA

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

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