

Evaluation of Treatment Results and Quality of Life in Patients with Refractory Headache, Treated with Nerve Block

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ARTICLE INFO	ABSTRACT
<p>Article type: Original Article</p> <hr/> <p>Article History: Received: 22 Jul 2023 Accepted: 30 Dec 2023</p> <hr/> <p>Key words: Acute headache, Headache, Nerve blockade, Peripheral nerve blocks</p>	<p>Introduction: Headache is one of the most common causes of emergency hospitalizations in world. Different therapies are used in both acute and prophylactic phase of headaches, but some patients do not have great response to pharmaceutical therapies. These patients can benefit from injection of peripheral nerve blocks depending on the headache type. This study aimed to evaluate the effects of nerve blocks in treatment of patients with refractory primary headaches.</p> <p>Materials and Methods: This cross-sectional study was done on 187 patients who referred to the emergency of Alavi hospital in Ardabil at year 2021 that had not response to the decrease in severity of headache up to 50% based on MIDAS and also cured with nerve blocks. The necessary checklist were completed for all patients and the severity, frequency and the interval of headaches were registered and compared in one day, one week and one month after the blocks and collected data were analyzed by statistical test like independent and Paired t-tests and Anova in SPSS version 21.</p> <p>Results: The mean severity of headache in patients significantly decreased during the study periods compared to before nerve blocker injection. The most common complications after nerve block in patients were anesthetized with 53%, followed by injection site pain and swelling each with 22.5% and then tachycardia with 19.8%.</p> <p>Conclusion: Peripheral nerve block in patients with primary headache can reduce the severity of pain in one month after the block nerve injection and in acute phase it can improve symptoms in middle-term.</p>
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Introduction

Headaches are one of the most common causes of clinic visits and one of the top five causes of emergency room visits and are very common among people around the world (1,2).

There are different types of headaches including migraine headaches, cluster headaches and tension headaches, and each of them have different treatment (3). Treatment of migraine headaches is a developable theme among headache specialists. A variety of treatments are used in controlling acute phase and prophylaxis. Life-saving treatments for acute migraine consist of non-steroidal anti-inflammatory drugs, acetaminophen, opioids and triptans. Maintenance therapy includes anticonvulsants, antihypertensive drugs, and antidepressants that are combined with non-pharmacological treatments such as acupuncture and physical therapy. Despite these therapies, many patients experience poor symptomatic therapy, and not all patients respond well to routine therapies and are resistant to these therapies and exposure with side-effects from medications. Recently, alternative therapies such as injections of botulinum toxin and nerve blocks with lidocaine and bupivacaine with or without corticosteroids have had very positive effects on the acute and medium-term treatment of these types of headaches. It has a positive effect, preventing the side effects of common drugs and based on previous studies, this method has been proposed as a better method for refractory headache with very few complications (4).

Migraines cause significant costs to society, especially when they reduce productivity in individuals and cause them to be absent from work (5). This cost is much higher in chronic migraines than in episodic migraine headaches (6). Controlling symptoms can reduce the disability caused by migraines and their social consequences, and as we know, conventional therapies such as lifestyle changes and diets, treatment of symptoms and prophylactic treatments cannot satisfactorily lead to management in some patients. In the past, many advanced methods have been introduced for the treatment of refractory migraines that one of

them is the injection of botulinum A, which was an effective method in the preventive treatment of chronic headaches (7). Due to the above and the lack of response to treatment in some patients despite conventional drug treatments, doing nerve block is recommended as an alternative treatment, and in this study, the effects of nerve block in the treatment of various headaches were investigated.

Materials and Methods

Study design and participants

This cross-sectional study was done on 187 patients referred with complaints of acute primary headache including migraine, cluster and tension headaches diagnosed in a clinical examination by a neurologist according to the criteria set for refractory primary headache.

All patients who did not have the necessary criteria to diagnose primary headache resistant to treatment were excluded from the study and patients with including criteria were completed the consent form before treatment. Patients according to the type of headache in different groups including patients with episodic migraine headaches, chronic migraine, status migraine, episodic tension type headache, chronic tension type headache, uncommon tension type headache, cluster headache, daily chronic headache, migraine with aura, trigeminal neuralgia, cervicogenic headache, Hemicrania Continua, nonspecific headaches, combined headaches, were treated with nerve block like lidocaine 0.5% to 2% and the effect of nerve block on each type of headache were evaluated after treatment. In this study, the sampling method was census and all of patients with inclusion criteria were entered in the study during 2021.

Statistical Analysis

Data were prepared in a checklist and analyzed using descriptive statistical methods in the form of number, percentage, table, chart and statistical indicators in SPSS version 21 (SPSS Inc, Chicago, IL, USA). Independent t-test was used to compare the means between the two groups. Analysis of variance was used to evaluate the results between groups at different time intervals. Significant level in all tests was considered less than 0.05.

Ethical Approval

This study was approved and registered in the ethics committee of Ardabil University of Medical Sciences and registered with the ethics code IR.ARUMS.REC.1399.187.

Results

Of all patients, 40 (21.39%) were male and 147 (78.6%) females. Of all, 23 cases

(12.3%) had episodic migraine headache, 40 cases (21.4%) chronic migraine headache, and 8 cases (4.27%) status migraine headache.

The average number of days with headache before nerve block was 12.1 days in women and 7.4 days in men, and the average headache intervals were 4.1 days in women and 7.1 in men (Table 1).

Table 1: Demographic information and clinical examination of patients by pain

Types of headaches	n		Mean number of days with headache		Location of headache						Mean intervals between headaches	
					right		left		bilateral		women	men
	women	men	women	men	women	men	women	men				
Episodic migraine	18	5	3	2	4	1	4	0	10	4	3.6	4.6
Chronic migraine	32	8	18	14.5	8	2	6	2	18	4	2.3	1.8
Migraine status	6	2	2	1	1	0	0	1	5	1	5.3	7
Chronic tension	8	2	16	15	2	0	0	0	6	2	2.3	1
Episodic tension	6	3	7	4	0	0	0	0	6	3	3.3	22.3
Uncommon tension	6	1	1	1	0	0	1	0	5	1	6.3	30
Chronic daily headache	13	3	24.5	20.7	0	0	0	0	13	3	1.5	1
Cluster	0	2	0	2	0	1	0	1	0	0	0	18.5
Migraine with aura	9	5	1	2	1	1	4	0	4	4	15.7	20.8
Hemicrania Cantita	8	1	30.5	0	7	1	1	0	0	0	30	18
Trigeminal neuralgia headache	3	2	10.2	10	2	1	1	1	0	0	3.7	3
Cervicogenic headache	5	3	3	8	2	0	3	3	0	0	3.8	1.7
Nonspecific headache	21	7	8	3	5	4	8	1	8	2	3	2.4
Hybrid headacche	5	3	5	3	1	1	1	0	3	2	7	2.3
Total primary headaches	140	47	12.1	7.4	33	12	29	9	77	27	4.1	7.1

The mean age of female patients was 38.11 ± 15.1 in the range of 17-75 and 40.66 ± 14.03 in the age range of 73-23. Most of patients had primary education 70(37.4%). Of the total patients, 33.2% had a family history of the disease and the residence most of them was urban (64.2%). Of the total patients, 36.4% were employed.

The mean severity of headache in patients significantly decreased during the study

periods compared to before nerve blocker injection (Table 2).

The number of painkillers, including NSAIDs, opioids, and triptans, decreased significantly one month after treatment with the nerve block compared to before treatment. The most common complications after nerve block in patients were anesthetized with 53%, followed by injection site pain and swelling each with

22.5% and then tachycardia with 19.8% (Figure 1). The average number of days with headache in most of patients one month

after treatment with nerve block were decreased compare to the baseline before treatment (Table 3).

Table 2: Average severity of headache at different times by types of headaches

Times/ Type of Headache	Before Treatment	One day after	One week after	One month after	p-value
Episodic migraine	1.83±7.3	2.2±2.3	1.7±1.14	2.4±4.5	0.001
Chronic migraine	1.9±6.9	0.98±0.9	2.2±2.4	2±4.75	0.001
Status migraine	1±8.13	3.2±2.7	2.8±2.3	2.3±3.4	0.001
Chronic tense migraine	1.1±6.5	3±1.6	4±1.4	1.4±4.8	0.001
Episodic headache	1.1±6.7	3.7±1.3	3.1±1.4	1.5±5.9	0.001
Uncommon tense headache	0.53±5.5	3.14±1.67	3.57±2.16	0.76±4.71	0.015
Chronic daily headache	1.34±5.75	3.56±2.9	5.69±2.49	3.19±5.25	0.001
Cluster headache	0.0±10.0	3.50±0.71	3.50±0.71	0.0±4.0	0.049
Migraine with aura	0.82±7.29	2.86±1.56	3.57±1.01	0.89±6.21	0.001
Hemicrania Cantita headache	1.24±7.44	3.0±1.94	5.87±2.72	2.05±5.78	0.001
Trigeminal	0.89±9.4	2.4±2.3	4.2±2.95	1.0±9.0	0.001
Cervicogenic headache	0.99±7.13	2.88±3.04	6.13±1.24	1.77±6.5	0.001
Nonspecific headache	1.54±6.68	3.11±2.94	4.0±2.85	2.07±5.29	0.001
Hybrid headache	1.35±7.13	4.38±2.56	4.63±1.92	1.41±4.0	0.003
Total	6.95±1.62	2.3±2.57	2.5±3.53	2.19±5.14	0.001

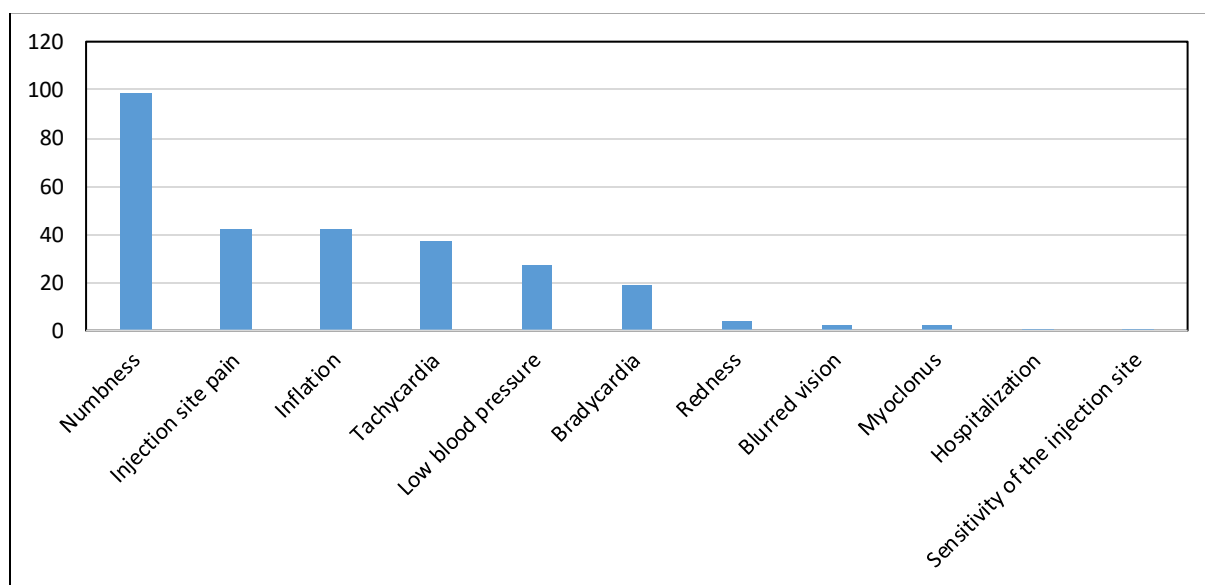


Figure 1: Complications after nerve block injection in all patients

Table 3: Average the number of days with headache in the last month at different times by types of headaches

Time type of headache	Before treatment	One month after treatment	P-value
Primary headaches	10.9±8.60	6.56±8.27	0.001
Episodic migraine	1.08±2.73	0.85±2.0	0.002
Chronic migraine	1.88±6.92	2.0±4.75	0.001
Status migraine	1.03±1.75	0.92±1.0	0.003
Chronic tense migraine	1.42±15.8	1.52±8.9	0.001
Episodic headache	2.12±6.0	1.58±5.33	0.022
Uncommon tense headache	0.89±1.85	1.85±0.89	1
Chronic daily headache	3.49±23.75	3.18±18.12	0.001
Cluster headache	1.41±2.00	0.0±1	0.05
Migraine with aura	0.88±2.0	1.86±4.28	0.001
Hemicrania Cantita headache	28.66±4.82	23.11±3.48	0.001
Trigeminal	10.2±1.30	9.6±1.14	0.07
Cervicogenic headache	4.87±2.75	3.75±1.67	0.135
Nonspecific headache	6.75±2.84	4.25±2.02	0.001
Hybrid headache	3.81±0.65	3.0±1.31	0.96

The average of intervals between headaches in most of patients one month after treatment with nerve block were

decreased compare to the baseline before treatment (Table 4).

Table 4: Average the intervals between headaches at different times by types of headaches

Time/type of headache	Before treatment	One month after treatment	P-value
Primary headaches	6.99±4.88	9.43±7.76	0.001
Episodic migraine	3.78±2.53	11.74±10.9	0.004
Chronic migraine	2.15±1.68	3.9±2.44	0.001
Status migraine	5.75±2.35	9.47±7.12	0.67
Chronic tense migraine	2.00±1.05	3.8±2.34	0.029
Episodic headache	11.69±9.67	4.55±2.4	0.008
Uncommon tense headache	9.71±9.06	4.55±2.4	1
Chronic daily headache	1.37±0.81	2.5±2.37	0.014
Cluster headache	18.5±16.26	0.0±30.00	0.05
Migraine with aura	17.50±13.9	21.21±12.29	0.116
Hemicrania Cantita headache	5.78±9.43	18.89±13.25	0.019
Trigeminal	3.4±2.19	3.8±3.03	0.75
Cervicogenic headache	3.0±2.62	4.0±2.62	0.381
Nonspecific headache	2.87±2.37	6.46±8.68	0.031
Hybrid headache	5.25±2.49	5.25±2.49	1.0

Discussion

The present study showed that nerve block reduced the severity of headache in most of headaches. Also, we saw a decrease in the severity of headache on the first day in most of headaches. We continued to reduce days with headache within a month after nerve block injection and show this. Headache intervals have also increased in episodic migraine, chronic migraine, chronic tension, chronic daily migraine, clustering, hemicrania and nonspecific headaches, and in chronic daily and non-specific types, this increase has been greater in women than men. Also, performing nerve block caused a clear reduction in the use of various analgesics in patients with headache. Symptoms associated with headache such as nausea, vomiting, insomnia, etc. decreased after nerve block.

Findings of a retrospective cohort study by Allen et al., showed that GON nerve block is an effective treatment for the management of acute migraine headache. These results are not related to patients' gender, age and previous treatments and the number of blocks performed, but there is a significant difference between receiving two blocks in GON and the severity of pain which was in line with our study results because in this study in a high percentage of patients the severity of headaches was decreased after nerve block trophy (8).

Stephanie et al., in a study showed that peripheral nerve stimulation and pericranial nerve blocks are as an invasive technique which are used in the treatment of migraine type headaches which was similar to our study results (9). Another prospective study by Ashkenazi et al. examined the effect of GON nerve block on headache pains in a cohort study of 19 patients with migraine. Both local anesthetics and steroids have been used. In this study, improvement in headache was reported in 90% of the group following the treatment process. In the study, which used only local anesthesia without steroids for the block, an improvement in headache severity was observed in all study groups. Also, further studies can be performed to investigate the effect of steroids on the nerve block in the future (10). A study published by Cuadrado et al. In 2016 included 36 patients with

chronic migraine, of whom 16 received GON blockade with bupivacaine and 16 received saline. According to this study, nerve block had a better response than the control group in terms of reducing the frequency of headaches in the first week after treatment (11). In the current study in 40 patients with chronic migraine for whom nerve block was performed, the number of days with headache decreased in one month after treatment with nerve block. A study by Chowdhury et al., showed that greater occipital nerve block (GON-block) is a useful modality of treatment in various headache disorders because of many attractive features such as its early effect in reducing the severity of pain, sustained effect following a single injection, easy technique, minimum invasiveness, minimum TEAE, no drug-to-drug interactions, and negligible cost (12).

In the present study, the response to treatment was seen in terms of severity, intervals and frequency of headache, but due to the small sample size, it was not possible to evaluate the difference in response to treatment and classification between the two groups. In the global classification of ICDH3 headache, peripheral causes are more common for episodic tension headaches and central causes are more common among patients with chronic tension headaches, which may indicate a greater effect of nerve block on episodic tension headaches (13).

According to E Leinisch-Dahlke, in which 15 patients with chronic tension-type headaches underwent nerve block with prilocaine (50 mg) and dexamethasone, they concluded that GON nerve block was not a suitable treatment for treatment of patients with chronic tension-type headache (14). However, in a retrospective study by Hascalovici et al., 64 patients with migraine headaches, chronic tension, and trigeminal neuralgia, etc., underwent peripheral nerve block. In this study, the overall response to treatment was 73% and in chronic migraine 81%. Episodic migraine was reported in 75%, chronic tension headache in 67%, chronic daily in 67%, and occipital neuralgia in 60% (15). Also, in the current study that examined nerve block in 10 patients with chronic tension headache and 9 patients with episodic tension headache, we

concluded that nerve block significantly reduces the severity of headache in both episodic and chronic tension headaches. In the study of Stern et al., peripheral nerve blocks, especially occipital nerve blocks, are a viable treatment option for migraine and may be helpful in cluster headache as a transitional therapy or rescue therapy. Additional prospective studies are needed to investigate the efficacy and safety of occipital nerve blocks for long-term migraine prevention, as well as for other headache disorders, such as occipital neuralgia which was confirmed our study results (16). Also, in the current study we saw a significant reduction in headache severity in cervicogenic headache at the first day and the first week after nerve block. In another study of infraorbital neural blockade in 35 patients with trigeminal neuralgia whose mid-term response was evaluated, Han concluded that neural blockade with 10% lidocaine (high concentration) could be used in the treatment of trigeminal neuralgia to reduce the severity of neuralgia. To be used (17).

In another study by Hascalovici et al., PNBs might be a safe and effective alternative headache management strategy for older adults. Medical and psychiatric comorbidities, medication overuse, and Beers list medication rates were extraordinarily high, giving credence to the use of peripherally administered therapies in the geriatric population that may be better tolerated and safer which was similar to our study results (18). Also in the current study, we saw a reduction in headache severity on the first day and first week in trigeminal neuralgia in patients. Fernandes L's article on peripheral nerve block methods for the treatment of headache and its complications states that complications include injection site allergy, injection pain, injection site bleeding, lightheadedness and vasovagal syncope, teratogenicity in pregnancy and hair loss, and skin atrophy. It has been reported (19). In the present study, complications such as injection site pain, swelling, redness, numbness, blurred vision, hypotension, myoclonus, tachycardia, injection site sensitivity and bradycardia were observed that were easily manageable and had not a great impact on patients'

quality of life. Failure to receive accurate information from the patient may have affected the accuracy of the information obtained. Other limitations of this study were the lack of a control group, the spread of the Covid-19 virus, the short follow-up time of patients and the evaluation of treatment effects up to one month, and the small number of patients with different types of headaches were the limitations of this study.

Conclusion

In summary, nerve block reduces the severity of headaches in primary headaches and can reduce the days associated with headaches during the first month after nerve block injection and increase the interval between the occurrences of headaches and can be used as an alternative treatment for a variety of headaches and this method can be used as an alternative method for medication treatment.

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