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CORRESPONDENCE

A preliminary study evaluating the response to greater occipital nerve (GON) blockage therapy in patients with vestibular migraine

We herein report the efficacy of greater occipital nerve (GON) blockage on headache and vertigo in patients with vestibular migraine (VM).

VM is a clinical condition characterized by vestibular attacks associated with migrainous features.[1] For the diagnosis, five episodes with vestibular symptoms of moderate or severe intensity, lasting 5 minutes to 72 hours are needed in an individual with a current or previous history of migraine.[2] In addition, half of the vestibular symptoms require accompaniment of one or more migraine features, including migraine-like headache or photophobia, phonophobia, or visual aura.[2] It has a prevalence of 2.7% in adults and is 1.5 to 5 times more common in women.[3]

GON blockage has been shown to be effective[4] and superior to placebo[5] in chronic migraine. Independently of medical treatment, GON blockage reduces the frequency, duration, and intensity of headache attacks, analgesic use, and improves patients' quality of life.[4,5]

The aim of our study was to evaluate the efficacy of GON blockage on frequency (assessed by episodes per month) and intensity (determined by visual analog scales (VAS) measured in centimeters from 0 to 10) of headache and vertigo attacks in patients with VM. Patients admitted to the Headache Outpatient Clinic in the Neurology Department of Manisa Celal Bayar University Medical School between 2022-2023 were retrospectively analyzed. The study protocol was approved by the Manisa Celal Bayar University Medical School Ethics Committee (reference number: 25/ 09 / 2023 /359).

The inclusion criteria were as follows: 1. Age above 18 years old; 2. Diagnosed with VM according to the International Classification of Headache Disorders[2]; 3. Having received medical treatment for prophylaxis at an effective dose (venlafaxine or propranolol depending on the presence of comorbidities like depression or hypertension) for at least 3 months without a decrease in the frequency and/or intensity of the headache or vertigo attacks and 4. Having received bilateral GON blockage (1.5 cc diluted form of 0.5% bupivacaine (5 mg/ml) and 1 cc physiological saline) for 3 months (once a week in the first month, once a month in the 2nd and 3rd months). Headache and vertigo frequency and intensity before the application was compared with the results after the third month injections.

GON blockage was not used in patients with secondary causes of headache (tumor, hydrocephalus, excessive use of analgesics, spinal and/or cranial surgery, malignancy, psychiatric disorder, history of occipital nerve stimulation, hypertension, thyroid dysfunction, cardiac arrhythmia, hemorrhagic diathesis, neuromuscular dysfunction, use of anticoagulants, hair skin infection, and open skull defect).

IBM SPSS Statistics for Windows, Version 25.0 (IBM Corp. Released 2017, Armonk, NY) was used for the statistical analysis. Normality of distribution of the numerical variables was determined by the Shapiro Wilk test. Data not showing normal distribution were evaluated with Mann- Whitney U test. A p value of < 0.05 was regarded as significant.

Twenty-five patients (22 women and 3 men) diagnosed with VM with a mean age of 41.1 ± 6.9 years were included to the study. The mean duration of symptoms was 102.96 ± 85.9 months. The headache and vertigo attack frequency and severity of the patients before and after treatment is given in Table 1. A significant decrease in the frequency and severity of both headache and vertigo attacks was observed after GON blockage ($p<0.001$).

Table 1: Evaluation of the effect of GON blockage on headache and vertigo attacks

Symptom	Before GON blockage (n:25)	After GON Blockage (n:25)	p*
Headache (VAS)	6.64±1.04 (5-8)	3.72±1.98 (1-6)	**<0.001**
Headache frequency/month	10.28±2.45 (7-15)	2.68±1.49 (1-8)	**<0.001**
Vertigo attack (VAS)	6.88±1.26 (5-9)	4.08±2.27 (1-9)	**<0.001**
Vertigo attack frequency/month	14.68±3.56 (10-20)	7.88±4.70 (2-20)	**<0.001**

*Mann-Whitney U test

Altered neural activity in the trigeminovascular system is thought to be the pathophysiology of migraine. Neuropeptides [substance P, calcitonin gene-related peptide (CGRP)] that are released by activation of the trigeminovascular system cause vasodilatation and neurogenic inflammation and trigger headache. Some of the neurotransmitters (serotonin, CGRP) that have a role in migraine pathophysiology are also present in the vestibular system. This is thought to be the underlying mechanism for the vestibular symptoms accompanying migraine headaches.[6] The trigeminal nucleus is connected with both thalami, which project signals to temporal, parietal, insular and cingulate cortical regions involved in vestibular processing. Moreover, nociceptive brainstem centers such as the nucleus raphe magnus, periaqueductal gray matter and hypothalamic areas are associated with the trigominovascular system and vestibular nuclei.[7] With these reciprocal connections the trigominovascular and vestibular systems modulate each other's activity. GON blockage decreases afferent inputs to the trigeminal nucleus caudalis, resulting in attenuated neuronal hyperexcitability and modulation of pain. Due to the connections between the trigeminovascular and vestibular pathways it can be expected to be effective on vestibular symptoms, as was observed in our patients.

Our study is the first to evaluate the efficacy of GON blockage in VM. We found that it not only caused an improvement in headache but also a decrease in both vertigo attack frequency and severity. This preliminary report may guide further studies in VM patients not responding to conventional medical treatment.

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