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Original research article

Efficacy of the greater occipital nerve block in recurrent migraine type headaches



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ABSTRACT

Aims: We aimed to evaluate six months of results following repeated GON blocks.

Methods: We evaluated the results from GON block performed on 60 patients. Briefly, we applied a standard 2 mL of 0.5% Bupivacaine GON blockage once a week for 4 weeks. We recorded the Visual Analog Scale (VAS) scores, the number of migraine attacks and the Migraine Disability Assessment Questionnaire (MIDAS) scores. The study subjects were not allowed to use medication for prophylaxis, and Ibuprofen (400 mg, 1200 mg at maximum) was prescribed for any migraine attacks.

Results: The initial mean number of attacks per month before starting treatment was 8.33 + 2.31. After treatment, the initial MIDAS mean was found to be 2.82 per month; this declined to 1.47 in 3rd, and was 1.50 in the 6th month. The individual month values were found to be significant, and were listed respectively as, 1st month: 3.95 + 2.52, 2nd month: 3.23 + 1.82, 3rd month: 2.60 + 1.90, 4th month: 2.68 + 2.10, 5th month: 2.58 + 1.90 and 6th month: 2.58 + 1.90. The mean VAS scores were recorded as follows for each month: 6.28 ± 1.24, 3.13 ± 0.97, 2.55 ± 1.19, 2.35 ± 1.26, 2.38 ± 1.20 and 2.48 ± 1.30, respectively. This difference was noted to be statistically significant. No difference regarding the efficacy of the treatment was determined when the results were compared across age groups.

Conclusion: We assume that GON blockage with 2 mL of 0.5% Bupivacaine can be a supportive treatment in migraine treatment, with no serious adverse effects reported.

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1. Introduction

Migraine is a chronic disease which is characterized by recurrent mild or severe headaches, mostly related to a group of signs that

originate in the autonomic nervous system. The prominent theory regarding migraine, which is thought to be of neurovascular origin, is that it is triggered by an excitation of the cerebral cortex with abnormal control of the pain-related neurons in the trigeminal nucleus which are located in the brain stem.

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The major occipital nerve contains fibers from the dorsal primary ramus of the C2 segmental nerve and, to a lesser extent, the C3 cervical nerve [1]. Administration of a nerve block into the greater occipital nerve (GON) results in a blocking of the impulses from the site to areas innervated by it. In this way the load of input on the convergent neurons of the 2nd cervical neuron's dorsal horn is diminished and their sensitization is obstructed [2]. It is noted in the literature that the upper cervical nerves and the nucleus of the trigeminal nerve are connected [3]. Also, it has been shown that GON blocks and electrical stimuli to the cervical muscles increase the responses in the second cervical nerve's convergent neurons [4]. There is not yet a complete classification, but differences are evident in the results of GON blocks in patients with a diagnosis of cervicogenic, cluster and migraine headaches [5-7]. The outcomes of trials where blocks have been applied more than once are promising [8,9]. In trials with neurostimulation, the outcomes from recurrent or continuous stimulation verify the augmented efficacy of a GON block being applied more than once [10,11].

In this study, we aimed to evaluate six months of results following repeated GON blocks.

2. Materials and methods

60 patients, who were diagnosed with migraine, according to the International Headache Society (IHS) criteria (IHS, 2004), were included in a 6-month cohort study, after gathering each patient's written consent and the confirmation of the ethical committee [12]. Patients who were pregnant or nursing at the time of the trial, or who had experienced a previous surgical procedure at the site of the injection were excluded. When the patient was in a sitting position, with the head in hyperflexion, 2 mL of 0.5% Bupivacaine injection was applied medially and laterally to the occipital nerve with a 5 cm of 22 gauge needle after palpating the artery in the region which is on the 1/3 part, close to the occipital protuberance and on an imaginary line that is drawn from the occipital protuberance to the mastoid. This was administered following an appropriate site cleansing with povidone iodochloride. Patients were under observation for 30 min after the injection, and no medical device was used. Any complications in the subjects, for which the block level was evaluated by a pinprick test, were recorded. Blocks were repeated once a week for a month. No medical prophylaxis was given to the patients during the observational period of 6 months. For treatment of acute migraine attacks, Ibuprofen (400 mg, 1200 mg at maximum) was prescribed. During six month period, the number of attacks, the VAS level during the attack (VAS, is a horizontally or vertically drawn line, 10 cm in length, on which at one end "no pain" and at the other end "severe pain" is written), and a calculation of MIDAS (The Migraine Disability Assessment Questionnaire) scores on 3rd and 6th months were collected. MIDAS has been tested by Lipton et al. regarding its validity, ease of use, confidence, and its significance to health workers [13]. Ertas et al. validated the test (2004), and Gedikoglu et al. updated the test in 2005 [14,15].

3. Analysis of the data

SPSS 21.0 statistics packaged software was utilized for the analysis of the data. In the analysis, descriptive statistical methods (frequency, percentage, mean, standard deviation, respectively), One Way Anova and Repeated Measures Anova were used. In multiple comparisons where there was a difference between groups, Dunnett and Tukey HSD tests were chosen for discrimination purposes. Values with a probability of $p < 0.05$ were accepted as significant, whereas bigger values were identified as non-significant and no differences between the groups were reported.

4. Results

60 patients with a diagnosis of migraine were included, and when the subjects were evaluated in relation to age groups no significance was seen ($p > 0.05$) (Table 1). When the MIDAS scores were compared, there was a significant difference between them: the mean MIDAS score prior to the procedure was found to be 2.82, whereas this value declined to 1.47 in the 3rd month and was 1.50 in the 6th month ($p < 0.05$) (Table 2). In a comparison of VAS scores, the initial mean value for VAS was 6.28; the VAS scores during the following 6 months of observation were lower, and the difference was found to be significant ($p < 0.05$) (Table 3). The initial value for the number of attacks was 8.33, however, when compared to the values in the six months of follow-up, it was found to be lower, which was also significant ($p < 0.05$) (Table 4). In each period of measurement there was no significant difference in a comparison according to the age groups regarding MIDAS, VAS or the number of attacks ($p > 0.05$) (Table 5).

5. Discussion

Invasive procedures aimed at the peripheral nerves are becoming more popular nowadays; but, still, there are no completely accepted protocols for these procedures. Trials

Table 1 – Age groups of the subjects.

Age groups	n	%
≤34 years	13	21.67
35–39 years	16	26.67
40–44 years	13	21.67
≥45 years	18	30.00

Table 2 – Comparison of the MIDAS scores.

MIDAS	Mean	SS	p	Difference
Prior to procedure ^a	2.82	0.70	0.000 (F = 178.45)	a and b, c
3rd month ^b	1.47	0.72		b and a
6th month ^c	1.50	0.68		c and a

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