Discussion: Greater Occipital Nerve Block for the Treatment of Chronic Migraine Headaches: A Systematic Review and Meta-Analysis

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In this article, Shauly et al. aimed to clarify the role of greater occipital nerve blocks in the treatment of migraine headaches.[1] To this end, they performed a systematic review by pooling and analyzing results from nine randomized controlled trials. The authors concluded that greater occipital nerve blocks reduced the number of headaches days, in addition to headache severity, when compared to placebo.

Unfortunately, the limitations of this systematic review stem from the limitations of the studies that were pooled. As noted by the authors, the studies included do not perform the same comparisons: three studies[2–4] compare local anesthetic alone versus local anesthetic and steroid, while the remaining six studies[5–10] compare local anesthetic to saline. It is therefore very difficult to reach meaningful conclusions by pooling studies that have such different study and control groups. In particular, one cannot reach any conclusions concerning the efficacy of local anesthetics, because they were used in both the study and control groups in one-third of the studies included.

Consequently, it would have been more instructive if the authors had performed separate analyses for the two groups of studies. This would have helped clarify whether the effective ingredient of the block is actually the local anesthetic or the steroid. To add to the heterogeneity of the data, unlike the remainder of the studies, the study by Karadaş et al. did not look at patients with classic migraine headaches, but examined patients with triptan-overuse headaches going through abrupt medication withdrawal.[8] Moreover, in the study by Naja et al.,[9] more than half the patients received blocks in the facial area in addition to greater occipital nerve blocks, which muddies the results of a systematic review looking at greater occipital nerve blockade.

The other issue that arises is the problem of diagnosis and patient selection. All the studies included in this systematic review were performed by neurologists. For the most part, the neurology literature does not yet subscribe to the peripheral trigger theory of migraine headaches.[11] Numerous cadaver dissections have delineated the six potential compression points of the greater occipital nerve.[12–15] The point into which greater occipital nerve blocks are given is the third compression point, which corresponds to the emergence of the greater occipital nerve from the superficial surface of the semispinalis capitis. Therefore, when migraine surgeons perform this block, they do so with a precise knowledge of the underlying anatomy. In contrast, in the studies included in this systematic review, and as noted by the authors, the greater occipital nerve is not actually being used as the target of the block, but as a conduit to the central nervous system. This also implies that many of the patients included in these studies are not selected to have migraines originating from a greater occipital nerve trigger site, but represent a heterogeneous population with migraine headaches that may originate from other trigger sites as well. This is apparent in the study by Naja et al., where more than half of the patients had migraine headaches originating in the facial area.[9] The patients who "failed" to respond to a greater occipital nerve block in these studies may simply have migraines that do not originate from a greater occipital nerve trigger site.

The authors make the excellent point that a favorable response to a greater occipital nerve block is a predictor of good response to surgical

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decompression at that site. However, we would add that a careful history, potential blocks of other trigger sites, Doppler examination of potential vasculogenic compression points, and computed tomographic scans for patients with symptoms suggestive of a rhinogenic trigger site are also other diagnostic steps that may be selectively applied in appropriate patients to ensure that a precise map of each patient's migraine trigger sites is drawn before embarking on surgical decompression.[16]

In patients who are not good surgical candidates, who do not want surgery, or who do not receive insurance approval to undergo surgery, long-term, targeted injections of onabotulinumtoxinA into specific trigger sites is often a good option, and has been shown to achieve excellent outcomes over the long term.[17] Blocks are one of the most useful diagnostic steps when attempting to localize migraine trigger sites.[15] They are best administered when the patient presents with an active headache. However, blocks are not usually used as a long-term treatment option, because their beneficial effects are short lived. As rightfully noted by the authors, the average follow-up in the studies included in this systematic review was only 4 weeks, which is inadequate to assess the long-term efficacy of blocks. The published literature on the long-term therapeutic use of blocks suggests that repeated injections are usually necessary every 2 to 4 weeks, rendering this treatment option impractical.[18]

Another consideration is the methodology used in this study. As noted by the authors, the Jadad scale is easy to use, because it results in a numerical score from 1 to 5. We would argue, however, that this scale is too simplistic, subjective, and inadequate. To perform a true systematic review and meta-analysis, we would recommend following the Cochrane Collaboration methodology, as used in previous high-level meta-analyses published in this *Journal*.[19,20] This methodology thoroughly examines each study's heterogeneity[21] and level of evidence,[22] using a large number of objective criteria. By following the Cochrane Collaboration methodology, authors can ultimately generate practical recommendations with a measurable strength.[23]

Unfortunately, this study leaves more questions than answers. For instance, does the addition of corticosteroids to local anesthetics enhance the diagnostic accuracy of blocks? How do blocks and onabotulinumtoxinA compare in terms of diagnostic accuracy and cost? These will be fodder for future studies than can help guide treatment algorithms more effectively.

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