

Refractory Headaches And The Role Of Interventional Headache Medicine

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Headaches are among the most common conditions that physicians encounter in their daily practice. Migraine headaches alone affect nearly 15% of the United States population ¹. Not only do migraine headaches affect patients in different age groups, they tend to impact patients during their most productive years. It has been estimated that migraine headaches affect 7.4% of males between ages 30 and 39 and an astounding 24.4% of females in the same age group ². Although episodic migraine is the most common form of migraine headaches, according to the World Health Organization headache report, up to 4% of the world's population experience chronic migraine (headaches occurring on at least 15 days per month with at least 8 of these headaches meeting migraine criteria) ³. In addition to migraine's impressive prevalence, over 50% of all patients with migraine report significant or severe impairment and/or requirement for bed rest during migraine attacks ². It appears that migraine-related disability is associated not only with the headache phase of

a migraine attack but also with multiple migraine-associated symptoms such as photo and phonophobia, nausea and vomiting, inability to concentrate or even communicate efficiently with peers, family members, and many others.

According to the most recent 2016 Global Burden of Disease report, migraine is the leading cause of years lived with disability among patients between ages 15 and 49 years old ⁴. As expected, migraine-related disability increases with headache attacks frequency ⁵. The chronic migraine epidemiology and outcomes study (CAMEO) revealed that over 65% of patients with episodic migraine and 75% of patients with chronic migraine have missed family events and activities or their share of housework in the past month due to migraine-related impairment ⁶. Migraine also significantly impacts work-related activities. It has been estimated that 8% of patients with episodic migraine and 11% of patients with chronic migraine have been missing at least 1 day of work per week in the past 2

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weeks⁷. It has also been estimated that patients experiencing as little as 4 migraine attacks per month may encounter significant disability⁵. Based on migraine attack frequency and related disability, headache experts suggest offering prophylactic treatment options to patients with 4 migraine attacks per month or more⁸. Currently, there is a number of prophylactic medication classes that can be used in migraine treatment. We have been using beta-blockers, anticonvulsants, certain antidepressants, and neurotoxins as prophylactic options with good results. Yet, it has been estimated that only 26-29% of patients continue to adhere to their prophylactic treatment regimen at 6 months and only 17-20% continue to use their oral prophylactic medications at 12 months^{9, 10}. In general, this low adherence was observed with most available oral preventative medications with only minor variations¹⁰. Most recently a new class of migraine preventative medications has been developed – anti-CGRP (calcitonin gene-related peptide) monoclonal antibody. This is the first class of migraine prophylactic medications that have been developed for that specific purpose. Although our experience with CGRP monoclonal antibodies has been positive, we are still encountering patients who appear to be non-responsive even to these novel and overall highly effective and in general well tolerated medications. Considering that these medications became available a little over a year now it is too early to judge the adherence and overall patient's satisfaction.

When analyzing reasons for the low adherence to the available treatment options it appears that most patients discontinue medications due to side effects and low efficacy¹¹.

Then there is another subgroup of patients that appear to be refractory to multiple oral and even parenteral treatment options. Those are patients with refractory headaches. There have been multiple refractory headaches definitions proposed over the years and most of them conclude that refractory headaches are disabling headache disorders not responding to several acute and prophylactic treatment options^{12, 13}.

When analyzing the reasons for headache being refractory to traditional treatment options it has been determined that there are multiple contributing factors including incorrect diagnosis, inadequate pharmacological and non-pharmacological treatments, unrecognized exacerbating factors, and presence of comorbid conditions that have not been addressed¹⁴. Considering the significant prevalence of primary headache disorders and impressive disability combined with low adherence to medications there is a definite need for alternative treatment options. That is where interventional approaches might play (and have been playing) an important role. It is clear that interventional techniques are not for every clinical scenario and patients' selection is critical. There is a plethora of available interventional treatment options. Some of them could be safely performed in the office setting and include trigger point injections, occipital, supraorbital, infraorbital, auriculotemporal, greater auricular nerve blocks, and intranasal sphenopalatine ganglion blocks, etc. Other options may require a procedure or an operating room setting and these more sophisticated methods include percutaneous sphenopalatine ganglion blocks and radiofrequency ablations (RFA), cervical facet medial branch nerve blocks and RFA, Gasserian ganglion blocks and RFA, cervical epidural steroid injections, as well as neuromodulation options that target vagal, trigeminal, occipital nerves, or the sphenopalatine ganglion. Deep brain stimulation has also been investigated. There is also a growing arena of non-invasive neuromodulation modalities that include transcranial magnetic stimulation, vagus, supraorbital/supratrochlear nerves stimulation as well as remote electrical neuromodulation^{15, 16, 17}.

There is growing evidence of interventional treatment efficacy in patients with various headache disorders^{15, 16, 17, 18, 19}.

Overall, peripheral nerve blocks offer some significant advantages for both patient and physician. Most peripheral nerve blocks provide nearly immediate pain relief that may last days, weeks, or even months. There are very few contraindications and most of them are safe and can be performed in the office setting. Most of the

nerve blocks take very little time to perform and can be repeated on an as-needed basis. Another significant advantage is the lack of drug interactions.

It has been estimated that up to 69% of physicians have been successfully utilizing peripheral nerve blocks for the management of various headache disorders²⁰.

Appropriate and timely utilization of interventional treatment options might help physicians address those primary and secondary factors that have remained untreated and that have been contributing to headaches becoming refractory to traditional treatment approaches and overall disability.

At this point, there is a critical need for a better headache medicine education in medical schools and residencies as most programs do not offer any or sufficient lectures/presentations on the topic²¹. Exposure to interventional treatment options varies significantly in different neurology residency training programs and in general limited to onabotulinum toxin injections, peripheral nerve blocks, and trigger point injections²². Less than one-third of neurology residency programs allowed independent procedures performance by trainees²². Formal procedural credentialing is still extremely uncommon occurring only in 16.4-18.2%²².

At this point, although there have been no official studies published, we believe that headache medicine education is also inadequately addressed in pain management fellowship programs (our study is in-progress).

A recent survey among members of the American Society of Regional Anesthesia and Pain Medicine Society Headache Special Interest Group identified that there is a clear desire for expansion of headache medicine education. One hundred percent of respondents indicated that they felt the development of a headache curriculum within interventional pain fellowships was somewhat to be extremely useful. In addition, 85% of respondents

also indicated that the development of a headache curriculum within the society's annual meeting would be very to extremely useful. The survey also demonstrated high interest (85%) in the development of guidelines for the role and utility of interventional pain procedures in headache disorders including cervicogenic headache and medically refractory headaches, in addition to the creation of a repository of instructional "how to" materials for common headache interventions. Other methods that were reported as potentially useful as educational resources were the use of difficult case presentations (90% reported somewhat to extremely useful) and/or the use of concise, summarized, key point articles (100% reported somewhat to extremely useful). These results indicate the pain physicians have strong desires to enhance their knowledge base in regard to headache management.

Given this desire and considering our ever-growing knowledge and understanding of headaches and development of new pain management tools (both invasive and non-invasive) there is a need for further development for a recently emerged new subspecialty field – interventional headache medicine²³. That might close this gap and ultimately improve patient's quality of life and hopefully decrease the prevalence of refractory headaches.

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