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A Comparison of Pharmacotherapy versus Complementary Medicine in the Treatment of Migraines

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Abstract

Migraine headache is a common, universal neurological disorder that can be complicated to treat. Despite the wide availability of treatments used as prophylactic agents against migraines, outcomes have been inconsistent, and a number of patients do not respond to prophylactic medications. Therefore, it is important to investigate new non-pharmacological modalities accompanied with less adverse effects and maximal efficacy.

To determine if complementary medicine modalities such as acupuncture, botulinum toxin-A, or cognitive behavioral therapy can be as effective as traditional pharmacotherapy for the treatment of migraines, a literature review was completed using meta-analyses and clinical trial reviews. Despite the fact there are no studies that have specifically evaluated the research question posed, the compilation of many studies provides some cumulative data. Current literature suggests that pharmacotherapy remains the standard treatment for migraine headaches. Complementary medicine should be considered as an alternative or adjunct therapy and can be used in patients who experience undesirable side effects from pharmacotherapy, or rather have contraindications or intolerance of drug classes. Given the prevalence of migraines, applying this research with clinical application could help providers relay the best individualized treatment options for patients when it comes to managing chronic migraines. Current research regarding complementary medicine does show promise; however, more research still needs to be done in order to place complementary medicine as an equivalent treatment to pharmacotherapy.

Keywords: Migraine Prophylaxis, Migraine Complementary Medicine, Migraine Acupuncture, Migraine Cognitive Behavioral Therapy, Migraine Botulinum Toxin, Migraine Prevention, and Migraine Treatment

Introduction

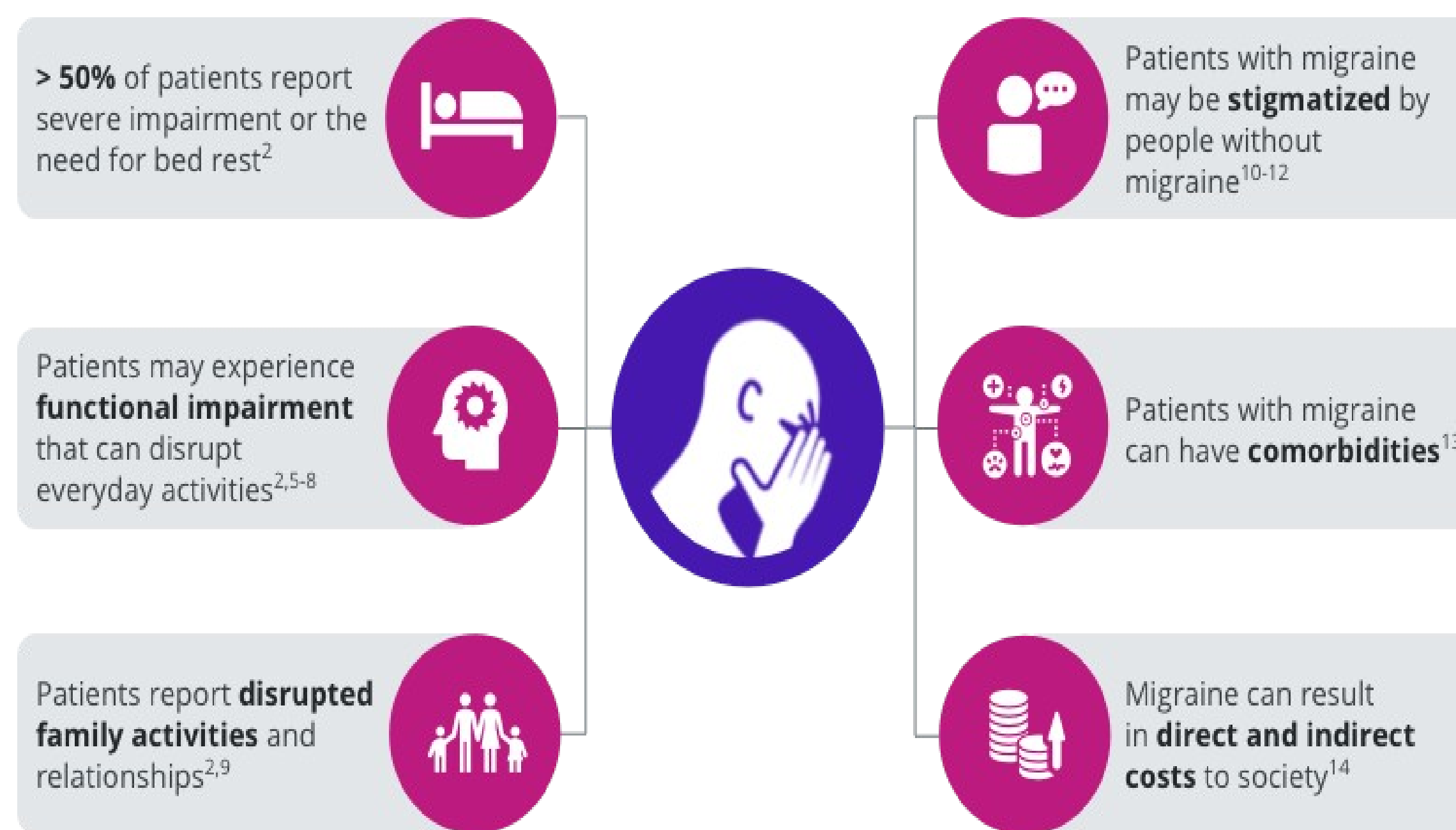
Migraine headache is an incapacitating neurological disorder that affects approximately 18% in women and 6% in men (Dakhale et al., 2019). According to the International Classification of Headache Disorders 2nd Edition (ICHD-II), chronic daily migraine is defined as migraine that occurs more than 15 days per month for at least three consecutive months in the absence of ongoing medication overuse (Magalhães et al., 2010). Resting-state MRI has been utilized to investigate changes in the connectivity of different brain regions before and during migraine attacks. Studies have shown altered connectivity of the cortex, thalamus, hypothalamus, brainstem, amygdala, and cerebellum consistent with changes in the function of multiple overlapping sensory and pain-processing circuits (Charles, 2018). The purpose of this literature review is to investigate the effectiveness of complementary medicine alternatives such as acupuncture, botulinum toxin-A, and cognitive behavioral therapy in comparison to traditional migraine pharmacotherapy.

Statement of the Problem

Although migraines are most often treated in primary care, management of this condition can be complicated. Besides increased healthcare costs, migraines cause severe impairment in more than half of those who suffer from migraine headaches, markedly impairing their quality of life both during and between attacks, increasing rates of absenteeism, and reducing productivity both at home and at work (Holroyd et al., 2010). Medication is currently the standard treatment for migraine headaches. Despite the wide availability of pharmacological alternatives used as first-line prophylactic agents against migraines, outcomes such as pain control have been inconsistent, and a number of patients do not respond to these medications. However, increasing amounts of knowledge and research about the pathophysiology of migraines is helping contribute to improvements in treatments. High levels of psychological comorbidity have led to migraines becoming more commonly viewed as a biopsychosocial condition (Cousins et al., 2015). Successful migraine management also depends on the individual clinician's approach, a patient's compliance, and realistic expectations. Patients may become noncompliant with medication because of the perceived ineffectiveness of the medication or the occurrence of side effects (Musil et al., 2018). Therefore, it is important to investigate new non-pharmacological modalities accompanied with less adverse effects and maximal efficacy.

Research Question

In patients with chronic migraines, what is the effect of pharmacotherapy on reducing migraine symptoms in comparison to complementary medicine?



Literature Review

Efficacy of preventative pharmacotherapy for chronic migraines

- Dakhale et al. (2019) concluded that both sodium valproate and propranolol SR significantly reduced frequency, severity, and duration of migraine headache; however, propranolol SR caused a significantly greater reduction in the severity of headache compared to sodium valproate ($p < 0.04$).
- Magalhães et al. (2010) found that botulinum toxin A is as effective as amitriptyline in the prophylaxis of chronic migraines, with fewer side effects.

Effect of botulinum toxin A on duration, frequency, and symptom management related to chronic migraines vs. pharmacotherapy

- Naderinabi et al. (2017) conducted a randomized controlled study to compare the effects of acupuncture, sodium valproate, and botulinum toxin A in controlling chronic migraine:
 - The acupuncture group showed a greater reduction in pain severity (from 8.6 to 3.8) than the botulinum toxin A group (from 8.9 to 5.0) and the sodium valproate control group (from 8.4 to 5.0) ($p < 0.001$).
 - The days per month of migraine attacks also significantly decreased from baseline in each group ($p < 0.001$), but when comparing each of the three groups, acupuncture again had better results than the botulinum toxin A group and the sodium valproate control group ($p < 0.001$).
 - When assessing the number of missed workdays due to headache, the number of days notably decreased in each of the three groups, but with less patients missing work and social activities in the botulinum toxin A group evaluated at three months ($p < 0.023$).
 - The number of patients using abortive therapy significantly decreased starting at one month in each of the three groups. Abortive medication use remained decreased at month three for the acupuncture and sodium valproate groups; however, there was an increase in abortive medication use in the botulinum toxin A group ($p < 0.001$).

Effect of acupuncture on duration, frequency, and symptom management related to chronic migraines vs. pharmacotherapy

- Giannini et al. (2021) found that acupuncture is as effective as pharmacologic treatment in decreasing migraine attack frequency and total migraine days, along with decreasing the amount of abortive medications administered post treatment.
- Xu et al. (2020) assessed the efficacy of manual acupuncture as a prophylactic treatment option, using sham acupuncture as a control:
 - In the manual acupuncture group, 82.5% of patients experienced a 50% reduction in the number of migraine days compared to 45.8% in the sham group ($p < 0.001$).
 - In the manual acupuncture group, 78.9% of patients experienced a 50% reduction in the number of migraine attacks compared to 44.1% in the sham group ($p < 0.001$).

Literature Review

Effect of cognitive behavioral therapy on duration, frequency, and symptom management related to chronic migraines vs. pharmacotherapy

- Cousins et al. (2015) found that standard medical treatment with cognitive behavioral therapy can be more effective than standard medical treatment alone. This data aligns with previous studies that have shown CBT and relaxation treatments with standard treatment for migraine headache are equally if not more effective than just standard treatment.
- Holroyd et al. (2010) reported that the combination of behavioral management with preventive treatment (such as a beta blocker), but preventive treatment alone or behavioral management alone, improved outcomes of migraine management such as reducing the number of migraine days (95% CI: -5.2 to -5.6) and reducing the total number of migraines (95% CI: -1.9 to -2.2) in a one-month period ($p < 0.05$).
- Wells et al. (2021) found that mindfulness-based stress reduction (MBSR) did not decrease migraine frequency any more than headache education. However, MBSR improved disability, quality of life, self-efficacy, pain catastrophizing, and depression at 12, 24, and 36 weeks, suggesting that MBSR may help treat total migraine burden.

Discussion

- Despite the fact there are no studies that have specifically evaluated the research question posed, the compilation of many studies provides some cumulative data. Insight was gained into several areas of treatment modalities for migraines. Many patients who suffer from migraine headaches require medication for an acute attack. However, patients with an increased frequency of attacks or who respond poorly to acute treatments are ideal candidates for prophylactic therapy (Dakhale et al., 2019). Medications approved for prophylactic treatment of migraine include propranolol, sodium valproate, amitriptyline, and topiramate among others. Unfortunately, none of the available prophylactic agents are universally effective; thus, the search continues to identify other treatment modalities with maximal efficacy and minimal side effects. Medication remains the current standard treatment for migraine headaches, but studies continue to reveal the benefits of complementary medicine, whether they are used individually from prophylactic medications or as an adjunct therapy.

- Although evidence for complementary medicine has conflicting results, there is some solid evidence that some patients with migraines may benefit from alternative methods such as cognitive behavioral therapy and traditional healing techniques such as acupuncture (Musil et al., 2018) or other techniques such as botulinum toxin A injections. Presently in clinical practice, botulinum toxin A and acupuncture are applied as non-pharmacological therapy choices in migraine treatment.

- This literature review suggests that there is strong evidence regarding the benefits of both pharmacotherapy and complementary medicine on reducing migraine symptoms. Research indicates that both modalities have proven effective; however, certain complementary treatments had promising results regarding decreasing migraine frequency and severity, along with less side effects compared to pharmacotherapy. Botulinum toxin A, acupuncture, and cognitive behavioral therapy could be considered for use in patients with chronic migraines as an alternative therapy or could be considered for use in patients who have known contraindications or intolerance of certain migraine prophylaxis medications. Despite this, treatments such as botulinum toxin A and acupuncture are more invasive than standard oral pharmacological treatment.

- The possibility that the combination of preventive pharmacotherapy and complementary medicine for migraine treatment can improve the outcomes achieved compared to either treatment modality alone is of particular interest but has yet to be formally evaluated. Additional information about the comparative benefits of complementary medicine when added to preventive pharmacotherapy as an adjunct should be explored further in future clinical trials.

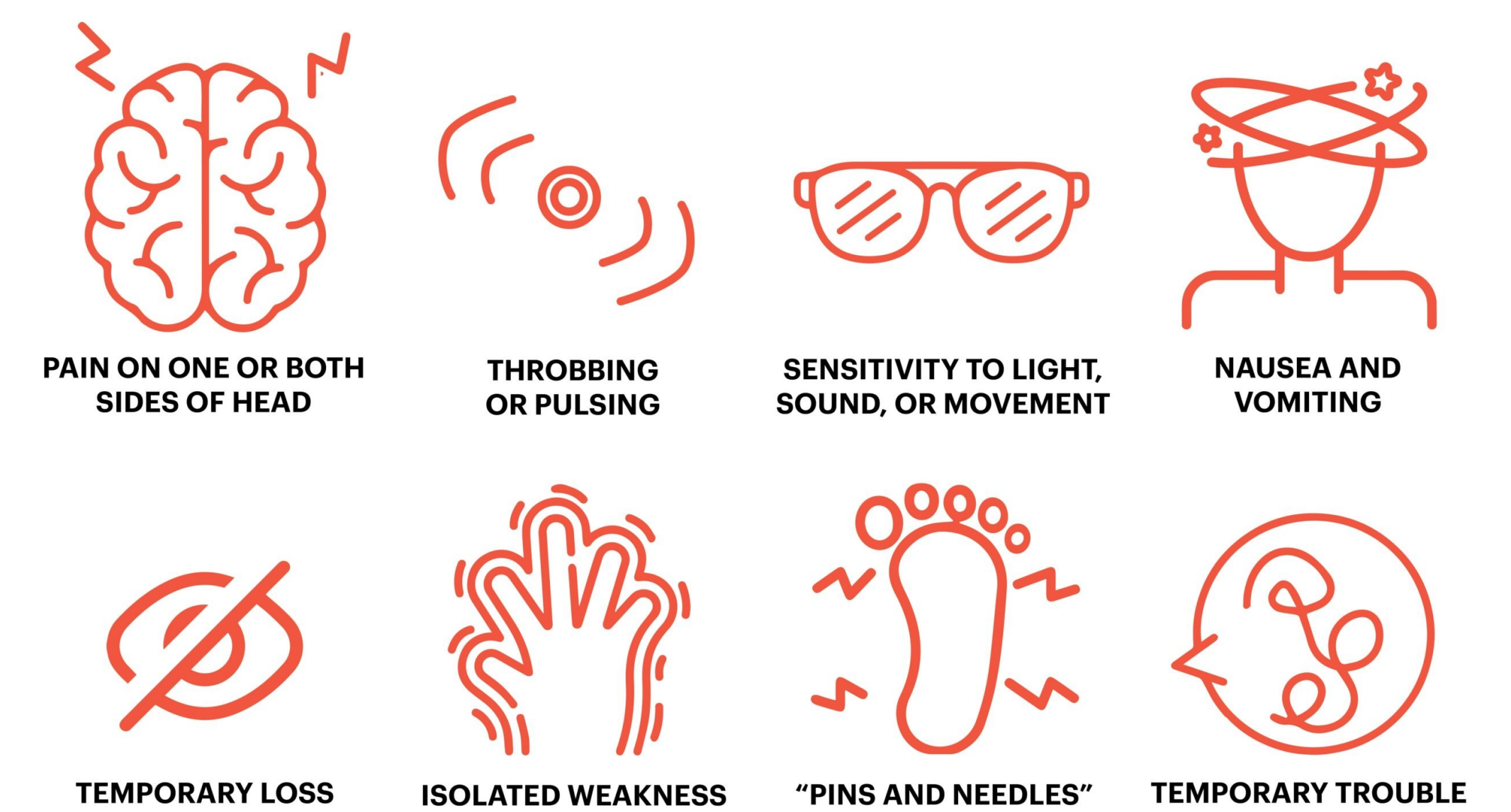
Applicability to Clinical Practice

Considering that successful migraine management largely depends on the individual clinician's approach, clinicians should be well-versed on prophylactic treatment options available for chronic migraine along with the ability to educate patients on complementary medicine alternatives. Complementary medicine such as acupuncture, botulinum toxin-A, and cognitive behavioral therapy are all non-pharmacological modalities that can be presented as potential options to patients whom pharmacotherapy has been ineffective. With continuing research, providers can continue to relay the best individualized treatment options for patients when it comes to managing chronic migraine.

References

- Charles A. (2018). The pathophysiology of migraine: implications for clinical management. *The Lancet. Neurology*, 17(2), 174–182. [https://doi.org/10.1016/S1474-4422\(17\)30435-0](https://doi.org/10.1016/S1474-4422(17)30435-0)
- Cousins, S., Ridsdale, L., Goldstein, L. H., Noble, A. J., Moore, S., & Seed, P. (2015). A pilot study of cognitive behavioural therapy and relaxation for migraine headache: a randomised controlled trial. *Journal of Neurology*, 262(12), 2764–2772. <https://doi.org/10.1007/s00415-015-7916-z>
- Dakhale, G., Sharma, V., Thakre, M., & Kalikar, M. (2019). Low-dose sodium valproate versus low-dose propranolol in prophylaxis of common migraine headache: A randomized, prospective, parallel, open-label study. *Indian Journal of Pharmacology*, 51(4), 255–262. https://doi.org/10.4103/ijp.IJP_457_18
- Giannini, G., Favoni, V., Merli, E., Nicodemo, M., Torelli, P., Matrà, E., Giovanardi, C. M., Cortelli, P., Pierangeli, G., & Cevallo, S. (2021). A randomized clinical trial on acupuncture versus best medical therapy in episodic migraine prophylaxis: The ACUMIGRAN study. *Frontiers in Neurology*, 11, 570335. <https://doi.org/10.3389/fneur.2020.570335>
- Holroyd, K. A., Cottrell, C. K., O'Donnell, F. J., Cordingley, G. E., Drew, J. B., Carlson, B. W., & Himawan, L. (2010). Effect of preventive (beta blocker) treatment, behavioural migraine management, or their combination on outcomes of optimised acute treatment in frequent migraine: randomised controlled trial. *BMJ (Clinical Research Ed.)*, 341, c4871. <https://doi.org/10.1136/bmj.c4871>
- Magalhães, E., Menezes, C., Cardeal, M., & Melo, A. (2010). Botulinum toxin type A versus amitriptyline for the treatment of chronic daily migraine. *Clinical Neurology and Neurosurgery*, 112(6), 463–466. <https://doi.org/10.1016/j.clineuro.2010.02.004>
- Musil, F., Pokladnikova, J., Pavelek, Z., Wang, B., Guan, X., & Valis, M. (2018). Acupuncture in migraine prophylaxis in Czech patients: an open-label randomized controlled trial. *Neuropsychiatric Disease and Treatment*, 14, 1221–1228. <https://doi.org/10.2147/NDT.S155119>
- Naderinabi, B., Saberi, A., Hashemi, M., Haghghi, M., Biazar, G., Abolhasan Gharehdaghi, F., Sedighinejad, A., & Chavoshi, T. (2017). Acupuncture and botulinum toxin A injection in the treatment of chronic migraine: A randomized controlled study. *Caspian Journal of Internal Medicine*, 8(3), 196–204. <https://doi.org/10.22088/cjim.8.3.196>
- Wells, R. E., O'Connell, N., Pierce, C. R., Estave, P., Penzien, D. B., Loder, E., Zeidan, F., & Houle, T. T. (2021). Effectiveness of mindfulness meditation vs headache education for adults with migraine: a randomized clinical trial. *JAMA Internal Medicine*, 181(3), 317–328. <https://doi.org/10.1001/jamainternmed.2020.7090>
- Xu, S., Yu, L., Luo, X., Wang, M., Chen, G., Zhang, Q., Liu, W., Zhou, Z., Song, J., Jing, H., Huang, G., Liang, F., Wang, H., & Wang, W. (2020). Manual acupuncture versus sham acupuncture and usual care for prophylaxis of episodic migraine without aura: multicentre, randomised clinical trial. *BMJ (Clinical Research Ed.)*, 368, m697. <https://doi.org/10.1136/bmj.m697>

COMMON MIGRAINE SYMPTOMS



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