

Short Note

Not peer-reviewed version

Pain or Pressure? Delineating between Primary and Secondary Headache

Vernon Davis Jr. , [Dev Desai](#) , Maria Eleni Malafi *

Posted Date: 26 December 2023

doi: 10.20944/preprints202312.1908.v1

Keywords: Headache; Migraine; Management; Intervention



Preprints.org is a free multidiscipline platform providing preprint service that is dedicated to making early versions of research outputs permanently available and citable. Preprints posted at Preprints.org appear in Web of Science, Crossref, Google Scholar, Scilit, Europe PMC.

Copyright: This is an open access article distributed under the Creative Commons Attribution License which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Disclaimer/Publisher's Note: The statements, opinions, and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions, or products referred to in the content.

Short Note

Pain or Pressure? Delineating between Primary and Secondary Headache

Vernon Davis Jr.¹, Dev Desai² and Maria Eleni Malafi^{3,*}

¹ National University: The University of the West Indies, West Indies; Email address: - vernondavis242@gmail.com

² Smt. NHLMMC, Ahmedabad, India; Email address: - devhdesai01@gmail.com

³ Medical School, Democritus University of Thrace, Alexandroupoli, Greece; Email address: - marilenmalafi@gmail.com

* Correspondence: marilenmalafi@gmail.com

Abstract: Headache is considered to be one of the most common causes of medical treatment and evaluation worldwide in both acute and outpatient settings. It is the most common neurological symptom seen worldwide affecting all genders, ages, ethnicities, and socioeconomic levels. Its impact is noted in educational decline in school-aged children and decreased productivity through sick leave in adults. Its overall burden is well documented in well-resourced countries but limited data is seen in low-resourced countries. While many underlying causes bring about secondary headaches, primary headaches and more specifically migraines have been more widely explored. Migraines have a distinct criterion that is inclusive of one day duration (4 hours to 7 days, unilateral distribution, nausea and vomiting and disability as a few examples). However, migraines can vary and proper documentation through a migraine diary can help to guide treatment. Management of migraines can vary. Lifestyle modification is a key factor in the overall prevention and reduction of triggers in migraines. In addition to this, pharmacotherapy can be given in a tier-based approach based on overall severity and frequency of the migraine. Interventions have progressed from botox injection and have seen the advent of new medications such as nasal sprays to novel formulations of pre-existing drug formulations. Nonetheless, there is great room for further studies of headaches and migraines. Research specifically in low-resource countries can prove to be beneficial.

Keywords: headache; migraine; management; intervention

Main body

One of the most common presenting complaints worldwide in clinical settings is headache. Headaches can manifest in clinical symptomatology on a wide spectrum of presentations, ranging from simple, non-threatening, intermittent pain signals to a severe, life-threatening warning sign of significant medical pathology. Despite a wide range of varying presentations, headache is a prevalent medical indicator of health concern that must be thoroughly investigated to ensure favorable health outcomes[1,2].

According to the World Health Organization, headache disorders are documented to be one of the most common disorders of the nervous system seen throughout the world, no matter the ethnicity[3]. In fact, the presentation of headaches far exceeds that of any other neurological symptoms in overall frequency. This includes, but is not limited to, changes in vision, challenges in coordination and loss of sensation or memory. Headaches even exceed strokes, seizures and memory loss in occurrence[4].

In fact, headache is one of the leading causes of disability worldwide and contribute to a growing concern when considering overall financial impact. For many countries, headaches represent a lifetime burden of greater than 90%. In the adult population, this can be attributed to major financial losses due to sick leave days resulting from the inability to function. In children, absence from school can be a major factor in academic decline and poor educational performance[5].

Despite this startling statistic, often times, headaches are not properly evaluated, and the root cause treated. Many times, patient try to resolve the matter home. In these instances, many time over the counter therapy can be sufficient. However, in other instances, traditional medications such as non-steroidal inflammatory drugs and other analgesia simply mask the problem. This can unfortunately lead to a greater extent disability or the onset of other detrimental clinical decline. Therefore, proper medical evaluation and management is essential. A clinician must be able to determine the underlying cause, through a detailed history and physical examination[6,7].

Headaches are not limited to one subgroup. They can manifest from infancy to geriatric populations. It is widely distributed among races, geography, income and education levels. While social determinants of health can play a role in the manifestation of headache, headache is not endemic to any one population or subset[8].

Headaches are often an early sign of other presentations of illness. Headaches can range from simply challenges such as dehydration to major concerns such as a thunderclap headache. There are several red flags that should alert practitioners to swift action. They include in children, focal deficits, explosive onset, headache associated with awakening or persistent emesis, altered mental status, pain worsening with the Valsalva maneuver or straining and headaches noted in children less than three years of age. In adults, however, signs such as papilledema, rapid onset with strenuous exercise, neck stiffness or meningismus, the worst headache of one's life, tenderness over the temporal artery and worsening pattern are certainly red flag to be on the alert for. Similarly, when new headaches can be linked to conditions such as cancer, Lyme disease or human immunodeficiency virus infection, further investigation is warranted and are of great concern. It is imperative to be on the alert for such warning signs[9,10].

Headaches can be delineated into two broad categories, namely primary and secondary headaches. Secondary headaches are the direct result of another underlying condition. In secondary headaches, they can be further delineated based on whether it is attributed to a systemic problem, or an intracranial or extracranial cause. This can be mass occupying lesions like humors or hemorrhages, pathologies like the Central nerve system like meningitis. Post head trauma, transient ischemic attack or disorders external to the central nervous system such as hypertensive emergencies, pre-eclampsia, vasculitis, or even medication and substance use[11,12]. Primary headaches, including migraine, are common neurological disorders that represent one of the most prevalent and disabling, although underdiagnosed and undertreated, forms of pain in childhood and adolescence[13].

Primary headaches, on the other hand, are extremely common clinical presentations seen in all healthcare settings from inpatient care centers like community, hospitals to outpatient facilities[14]. In Latin America and the Caribbean, primary headaches are highly prevalent in young females disproportionately when compared to their male counterparts. This can be attributed to the hormonal changes that females undergo. However, for some individuals, environmental and genetic factors can play a role in the development of their chronic headaches[15].

Prior to classic presentation of headaches in migraine are other phases of development. There is firstly a prodrome period that is considered the premonitory or preheadache phase. This occurs generally anywhere from three hours to several days prior to the aura, headache and postdrome phases that follow. During this time, the patient may experience vague symptoms such as fatigue, nausea, muscle stiffness, increased urination or trouble sleeping. There also may be mental health implications such as a feeling of depression, difficult concentrating, or irritability[16–18].

In the aura phase (which can range from as low as 5 minutes to as long as an hour), patients experience warning signs prior to the headache. This has been reported to include, but is not limited to, tinnitus, visual changes such as wavy lines, change in smell and taste or speech, flashing right lights or tingling in the skin. This is then followed by the actual headache that can last 4-72 hours. During this time, patients have sensitivity to light, odor or noises, loss of appetite, pallor, diaphoresis, nausea, vomiting, abdominal pain and even scalp tenderness. There is then a postdrome phase where the patient feels fatigue, euphoria, and disorientation.

Diagnosis of migraines can occur through careful history taking and examination of the patient. A pulsatile quality of headache is one clinical feature that begins the headache diagnosis. For

migraines, it normally should also be accompanied by nausea or vomiting, with at least a one day duration (generally 4-72 hours) and of unilateral distribution. The migraine should also be of a disabling intensity. There are also other qualifying factors that can be considered based on the diagnostic criteria utilized. They can include moderate to sever pain, photophobia and phonophobia, avoidance of routine activity. With aura, they can also include symptoms such as fully reversible dysphagia and homonymous visual symptoms[19].

One approach to overall management and proper migraine prevention is through lifestyle modification. Simple changes such as adequate sleep, eating a proper balanced diet and a consistent exercise regimen can help to significantly reduce the frequency of migraine attacks. This also means ensuring there is sufficient intake of fluids to ensure hydration and recognizing the impact caffeine and red wine can play on headache development as well. Stress reduction is also a major factor in reducing the frequency and severity of migraines. To optimize treatment and ensure accuracy of diagnosis, a headache diary is a useful tool of tracking he patterns and help to guide treatment. This can also help to link the symptoms to associations such as food choice, menstruation, and stressors. A daily diary is also a cost-effective means of monitoring headaches as it requires no special skill or elaborate technology.

Drug therapy can also be utilized. First line therapy for mild to moderate migraines can begin with medications such as acetaminophen and nonsteroidal anti-inflammatory drugs and triptans for moderate to severe migraines in adolescent and adult populations. In those with refractory migraines, antiemetics and dihydroerotamines can be used. However, with modern advancement, there are newer drug options. There are nasal sprays developed like the recently approved Zavzpret. There are also now orally administered calcitonin gene-related peptide receptor antagonists such as Ubrelvy. Novel formulations of older drugs are also now on market that are serotonin 5-T receptor agonists. OnabotulinumtoxinA, also known as Botox, can be used as a means of prevention of headaches as well and has been around now for over a decade[20].

There is certainly a need for greater research on headaches. Worldwide, scholarly evidence on the prevalence and incidence of headaches among children is scarce. In Developing countries, there is greater availability to modern and better scholarly research regarding efficacy of interventions. The burden of headaches can be better appreciated both from an epidemiological and financial perspective. This is in complete contrast to low resource healthcare settings, like the Caribbean and Central America, where access to critical data on headache is even more limited. In the Caribbean, there is a greater need for investment in the latest technological equipment that can add in the better management of headaches, particularly migraines. In other low resource areas, there is also a lack of resources. Therefore, data collection and research are less likely to occur[21].

Despite the global burden of headaches worldwide affect many levels of society, research remains limited. This leading neurological symptom continues to affect countless lives daily. There has been evidence worldwide that has suggested migraines can be linked to many social factors such as poor school attendance and lower productivity on the job. There have been several effective means of treating headaches However, these resources are not available in all healthcare settings. Even with the evolution of treatment options to include those that can be done in outpatient settings, migraines still persist.

Conclusion

Headache is a clinical symptom with much room for future research. There is existing data worldwide but underreporting is likely due to lack of resources in less-developed countries. While headaches are not limited to one age group, there are various red flags that must be noted based on age. Through prevention and keen clinical care, headaches can be less detrimental and debilitating. Its impact remains significant as it continues to be the leading cause of neurological disability in the world, impacting both the academic and occupational careers of children and adults respectively. With recent pharmacological developments, there continues to be promise in treatment.

Funding and Sponsorship: "None of the authors have a financial interest in any of the products, devices, or drugs mentioned in this manuscript."

Conflicts of interest: The authors declare no conflict of interest.

Ethical Statement: Being a Short note, there were no ethical issues and IRB permission is not required.

References

1. P. Rizzoli and W. J. Mullally, "Headache," *American Journal of Medicine*, vol. 131, no. 1. 2018. doi: 10.1016/j.amjmed.2017.09.005.
2. R. Burch, P. Rizzoli, and E. Loder, "The Prevalence and Impact of Migraine and Severe Headache in the United States: Figures and Trends From Government Health Studies," *Headache*, vol. 58, no. 4, 2018, doi: 10.1111/head.13281.
3. S. K. Parikh, J. Kempner, and W. B. Young, "Stigma and Migraine: Developing Effective Interventions," *Current Pain and Headache Reports*, vol. 25, no. 11. 2021. doi: 10.1007/s11916-021-00982-z.
4. T. J. Steiner *et al.*, "Aids to management of headache disorders in primary care (2nd edition)," *J Headache Pain*, vol. 20, no. 1, 2019, doi: 10.1186/s10194-018-0899-2.
5. D. Kopel and C. Gottschalk, "The Epidemiology of Primary Headache Disorders," *Semin Neurol*, vol. 42, no. 4, 2022, doi: 10.1055/a-1942-6823.
6. R. Raam and R. R. Tabatabai, "Headache in the Emergency Department: Avoiding Misdiagnosis of Dangerous Secondary Causes, An Update," *Emergency Medicine Clinics of North America*, vol. 39, no. 1. 2021. doi: 10.1016/j.emc.2020.09.004.
7. K. Ravishankar, "The art of history-taking in a headache patient," *Annals of Indian Academy of Neurology*, vol. 15, no. SUPPL. 2012. doi: 10.4103/0972-2327.99989.
8. F. Ahmed, "Headache disorders: differentiating and managing the common subtypes," *Br J Pain*, vol. 6, no. 3, 2012, doi: 10.1177/2049463712459691.
9. C. R. Clinch, "Evaluation of acute headaches in adults," *American Family Physician*, vol. 63, no. 4. 2001. doi: 10.1016/s1443-8461(01)80045-9.
10. R. Potter, K. Probyn, C. Bernstein, T. Pincus, M. Underwood, and M. Matharu, "Diagnostic and classification tools for chronic headache disorders: A systematic review," *Cephalalgia*, vol. 39, no. 6. 2019. doi: 10.1177/0333102418806864.
11. T. Wijeratne, C. Wijeratne, N. Korajkic, S. Bird, C. Sales, and F. Riederer, "Secondary headaches - red and green flags and their significance for diagnostics," *eNeurologicalSci*, vol. 32. 2023. doi: 10.1016/j.ensci.2023.100473.
12. C. J. Schankin and A. Straube, "Secondary headaches: Secondary or still primary?," *Journal of Headache and Pain*, vol. 13, no. 4. 2012. doi: 10.1007/s10194-012-0443-8.
13. M. S. Robbins and C. Szperka, "Headache in Children and Adolescents," *CONTINUUM Lifelong Learning in Neurology*, vol. 27, no. 3. 2021. doi: 10.1212/CON.0000000000000993.
14. A. Straube and A. Andreou, "Primary headaches during lifespan," *Journal of Headache and Pain*, vol. 20, no. 1. 2019. doi: 10.1186/s10194-019-0985-0.
15. K. Pacheco-Barrios *et al.*, "Primary headache disorders in Latin America and the Caribbean: A meta-analysis of population-based studies," *Cephalalgia*, vol. 43, no. 1. 2023. doi: 10.1177/03331024221128265.
16. D. W. Dodick, "A Phase-by-Phase Review of Migraine Pathophysiology," *Headache*, vol. 58, 2018, doi: 10.1111/head.13300.
17. C. P. Schreiber, "The pathophysiology of primary headache," *Primary Care - Clinics in Office Practice*, vol. 31, no. 2. 2004. doi: 10.1016/j.pop.2004.03.001.
18. S. Ashina, L. Bendtsen, and M. Ashina, "Pathophysiology of migraine and tension-type headache," *Tech Reg Anesth Pain Manag*, vol. 16, no. 1, 2012, doi: 10.1053/j.trap.2012.11.002.
19. A. K. Eigenbrodt *et al.*, "Diagnosis and management of migraine in ten steps," *Nature Reviews Neurology*, vol. 17, no. 8. 2021. doi: 10.1038/s41582-021-00509-5.
20. J. H. Vanderpluym *et al.*, "Acute Treatments for Episodic Migraine in Adults: A Systematic Review and Meta-analysis," *JAMA - Journal of the American Medical Association*, vol. 325, no. 23. 2021. doi: 10.1001/jama.2021.7939.
21. M. Leonardi *et al.*, "Global burden of headache disorders in children and adolescents 2007–2017," *Int J Environ Res Public Health*, vol. 18, no. 1, 2021, doi: 10.3390/ijerph18010250.

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.