

# Migraine Treatment

*John Sosa<sup>1</sup>*

Migraine headaches are one of the most common problems seen in the emergency room and in the doctors' clinic. What is migraine? The World Federation of Neurology states it as such: "Migraine is a familial disorder characterized by recurrent attacks of headache widely variable in intensity, frequency and duration. Attacks are commonly unilateral and are usually associated with anorexia, nausea and vomiting."

## **Causes**

Increased excitability of the CNS (central nervous system)

Meningeal blood vessel dilation

Activation of perivascular sensory trigeminal nerves

Pain impulses

Vasoactive neuropeptides including:

substance P

calcitonin gene-related peptide (CGRP)

neurokinin A

There is a combination of increased pain sensitivity, tissue and vessel swelling, and inflammation. (1, 8)

## **History of treatment**

Herbal brews and folk practices have been used for thousands of years. Around 1200 BC, the Egyptians used clay crocodile and magic potions as well as herbs. In the 10th century AD Arabian physicians used garlic applied to an incision at the temple or hot iron on the pain site. In the mid-1600's, Dr. Thomas Willis used enemas, bloodletting, leeches, and natural products. In the 1870's doctors prescribed a cold bandage on the head, a quiet room, and sleep (2).

## **Prevalence**

Migraine is one of the common causes of recurrent headaches. According to IHS (International Headache Society), migraine

constitutes 16% of primary headaches. Migraine afflicts 10-20% of the general population and half of migraine sufferers are not diagnosed, therefore being underdiagnosed and undertreated. It affects young women more than young men in a 3:1 proportion. The peak ages are 22-55. Migraine greatly affects the quality of life and the WHO ranks migraine among the world's most disabling medical illnesses. (3, 4)

Migraines are considered classic when presenting with aura, and common when presenting without aura. Headaches can last 4 to 72 hours and are usually unilateral, pulsating, with moderate to severe intensity and aggravated by routine physical activity. Rapid head movement, sneezing and straining also worsen the headache. During the headache, phonophobia, photophobia, tinnitus, nausea and vomiting can present. There can also be focal facial pain, cutaneous allodynia, gastrointestinal dysfunction, facial flushing, lacrimation, rhinorrhea, nasal congestion and vertigo. (5)

There is a long list of precipitating factors and these include stress, anger, fear, hunger, head and neck infection, head trauma/surgery, aged cheese, dairy, red wine, alcohol, nuts, shellfish, caffeine withdrawal, coffee, chocolate, vasodilators, perfumes/strong odors, irregular diet, irregular sleep or change in sleep pattern, exposure to bright light and hormonal changes (menstruation). (3, 5)

## **Treatment**

Long term treatment goals for the migraineur

---

*1.MD, Neurology, Karl Heusner Memorial Hospital Princess Margaret Drive, Belize city, Belize,  
Email: docjsosa@hotmail.com*

include reducing attack frequency and severity, avoiding escalation of headache medication, educating and enabling the patient to manage the disorder, and improving the patient's quality of life.

Non-pharmacological treatment should include the identification of triggers, meditation, relaxation training, and psychotherapy.

Pharmacotherapy is divided into abortive and preventative therapy.

Abortive therapy reduces headache recurrence and alleviates symptoms. Common medications include Tylenol and NSAID's, metoclopramide and vasoconstrictors.

Vasoconstrictors include caffeine, sympathomimetics, selective serotoninergics or triptans and nonselective ergots. (4, 6)

Abortive therapy is:

Stepped

Stratified

Staged

Stepped: Start with lower level drugs, and then switch to more specific drugs if symptoms persist or worsen.

Stratified: Adjust treatment according to symptom intensity: mild use analgesics, NSAIDs: moderate, analgesics plus caffeine/sympathomimetic drugs; severe, opioids, triptans, ergots.

Staged: Base treatment on intensity and time of attacks, Headache diary is reviewed with the patient, and there must be a medication plan and backup plans.

Ergotamine is structurally similar to the amines, serotonin, norepinephrine, and dopamine. It interacts with multiple receptors and causes constriction of the blood vessels. It has a wide range of effects and should be avoided if the patient has coronary disease. The safety margin is small and overdoses are quite frequent. Rebound headaches are possible with overuse.

Ergot containing medications should not be used within 24 hours of taking triptan medication.

The triptans include sumatriptan (Imitrex), rizatriptan (Maxalt), naratriptan (Amerge, Migtal), zolmitriptan (Zomig), eletriptan (Relpax, Relert), almotriptan (Axert), frovatriptan (Frova, Menatriptan). Triptan medications should not

be taken at the same time as SSRI (Selective serotonin reuptake inhibitor) medications. All triptans are contraindicated in the presence of cardiovascular disease.

Sumatriptan acts on receptors of smooth muscle cells in the brain vessels (also in peripheral blood vessels like the coronary artery, which can result in side effects). It was the first selective serotonin agonist approved for the treatment of migraine and provides rapid relief. It relieves pain of migraine and associated symptoms. It comes in three forms: oral, nasal and parenteral. Side effects include: change in taste, discomfort in the jaw or mouth, dizziness, drowsiness, lightheadedness, muscle aches, nausea or vomiting.

Rare side effects include severe chest pain, convulsions, swelling of the eyelids, shortness of breath and trouble breathing.

Zolmitriptan has oral bioavailability improved to 50% (sumatriptan 14%), a half-life of 3 hours and is taken orally at the onset of headache pain. Side effects include dizziness, nausea, sleepiness, muscle weakness, and chest pain. Rare side effects include severe abdominal pain, irregular heartbeat, fever or chills, loss of appetite, agitation, anxiety and depression. It may cause serious side effects in some people, especially those with heart or blood vessel disease.

Naratriptan has its oral bioavailability improved to 60%. It has a half-life of 5 to 6 hours and is taken orally at the onset of headache pain. It is not as effective as sumatriptan, but has fewer side effects. Side effects include dizziness, nausea, sleepiness, muscle weakness and chest pain. Rare side effects include acne or skin rash, anxiety, blurred vision, tiredness, and irregular heartbeat.

Rizatriptan has oral bioavailability of 40% and a half-life of 2.5 hours. It shows the fastest time of action. Side effects include dizziness, nausea, tiredness, hot flashes, chest pain and shortness of breath. Rare side effects include agitation, anxiety, blurred vision, chills, confusion, Insomnia, and irregular heartbeat.

Eletriptan has oral bioavailability of 50% and half-life of 4 hours. Side effects are generally transient and include dizziness, nausea,

weakness, tiredness, and pain or tightness in the chest or throat. Serious side effects include chest/jaw/left arm pain, fainting, irregular/pounding heartbeat, vision changes, severe nausea, weakness on one side of the body, confusion, slurred speech, sudden or severe stomach/abdominal pain, trouble swallowing, and bloody diarrhea.

Frovatriptan has mean terminal elimination half-life of approximately 26 hours, which is substantially longer than other triptans. Oral bioavailability is 20-30%. Side effects include flushing, sensations of tingling, numbness, prickling, heat, weakness, upset stomach, dry mouth, drowsiness, or dizziness. Serious side effects include chest pain, jaw/left arm pain, fainting, fast/irregular/pounding heartbeat, vision changes, weakness on one side of the body, confusion, slurred speech, sudden or severe stomach or abdominal pain, and bloody diarrhea. Serious but rare cardiac events have been reported in patients with risk factors predictive of CAD. These include: coronary artery vasospasms, transient myocardial ischemia, myocardial infarction, ventricular tachycardia and ventricular fibrillation.

Triptans are contraindicated in patients with: ischemic heart disease, cerebrovascular syndrome, peripheral vascular disease, uncontrolled hypertension, and hemiplegic or basilar migraine.

Abortive drugs should not be used more than 2-3 times a week. Long-term prophylaxis improves quality of life by reducing frequency and severity of attacks and it should be noticed that 80% of migraineurs may require prophylaxis. Preventative treatment or prophylaxis is considered if the patient has more than 3 to 4 episodes per month. It reduces frequency by 40 – 60%. Breakthrough headaches are easier to abort. Lifestyle modification is an important part of the treatment plan.

Medications used include:

Beta blockers:

Propranolol 40 mg/d-320mg/d, Atenolol 50 mg/d-200mg/d, Calcium channel blockers:

Verapamil 120 mg/d-720mg/d, Nifedipine 30 mg/d-180mg/d, Cyproheptadine 4 mg/d-36mg/d

Antidepressants:

Amitriptyline- 10 mg/d-150mg/d, Imipramine- 10 mg/d-200mg/d, Fluoxetine and other SSRI's- 10mg/d-80mg/d

Anticonvulsants:

VPA/divalproex 250mg/d-3000mg/d,

Topiramate 50mg- 200mg/d, Lithium: 300mg/d-900mg/d

## Conclusion

In summary, the right medication combined with self help remedies and lifestyle changes can make a major difference in the migraine sufferer's quality of life. It is therefore important for health care providers to have a basic knowledge of the treatment options available.

## References

1. Bailey BJ, Calhoun KH, Derkay CS, Friedman N, Gluckman J. Head and Neck Surgery – Otolaryngology 3rd Edition. Philadelphia: Lippincott Williams and Wilkins, 2001-10 pp 221-235.
2. Landy, S. Migraine throughout the Life Cycle: Treatment through the Ages. *Neurology*. 2004; 62: S2-S8.
3. Cutrer FM, Bajwa, ZH, Sabahat, A. Pathophysiology, Clinical Manifestations, and Diagnosis of Migraine in Adults. [online]. <http://www.uptodate.com/contents/pathophysiology-clinical-manifestations-and-diagnosis-of-migraine-in-adults> last updated: 2/2/2011.
4. Lipton, RB, Stewart, WF, Liberman, JN. Self-awareness of migraine: Interpreting the labels that headache sufferers apply to their headaches. *Neurology*. 2002; 58: S21-S26.
5. Cady, RK, Schreiber, CP. Sinus headache or migraine? Considerations in making a differential diagnosis. *Neurology*. 2002; 58: S10-S14.
6. Avnon, Y, Nitzan, M, Sprecher, E, Rogowski, Z, and Yarnitsky, D. Different patterns of parasympathetic activation in uni- and bilateral migraineurs. *Brain*. 2003; 126: 1660-1670.