

# The Science & History of Headache

## ***Victor Rosenfeld, M.D.***

Some would say that headache is a modern ailment and present in those who cannot handle the stress of modern life. In reality we know that headache has troubled humankind from the dawn of civilization. Evidence of Trepanation, an early form of neurosurgery, was found on skulls from 7000 BC thought to relieve the suffering of those with recurrent disabling headaches (see image below). The care and accuracy with which the skulls were operated on clearly indicate that these were not random or traumatic injuries by blunt objects but rather very carefully done procedures performed for a specific purpose. There is also ample evidence that the Egyptians performed this procedure on their ancient patients as a means to alleviate suffering and numerous references and paintings from the middle ages also demonstrate the widespread use of the procedure. Dr. John



*Example of neolithic trepanation*



*Victor Rosenfeld, M.D.*

Clarke was allegedly the first physician to perform the operation in the U.S. documented in a painting 1664. The issue of recurrent headaches as a limiter of social status or function recently hit the news when it was suggested that Michelle Bachman, who was seeking the nomination for Republican candidate would not be Presidential material because of her history of migraines and its tendency to produce intermittent incapacity.

The International headache Society classifies headaches currently into two categories. Primary Headaches are those which cannot be attributed to a specific organic cause or lesion and Secondary which is due to a specific cause. This classification system is endorsed by the World Health Organization. Primary Headaches are broken into four main categories, Migraine and its subsets, Tension Headache, Trigeminal Autonomic Cephalgias, such as Cluster Headache, and a Miscellaneous Category, which includes oddities such as Headache with Sexual Activity, Ice Pick Headache, and a newer diagnosis, New Daily Persistent Headache. Secondary Headache include eight broad categories including those due to head injury, vascular problems, those due to chemical substances or their withdrawal, infections, those associated with metabolic disorders, problems with the cranium, eyes, neck, ears, sinuses, and mouth, and lastly pain from the cranial nerves themselves, such as Trigeminal Neuralgia, otherwise known as "Tic Delareaux".

Migraine is the most common form of headache that results in medical evaluation and treatment and is present in roughly fifteen to twenty percent of the population and is seen in about



five percent of children . The gender ratio for migraine in children is about 1:1, with a slight preponderance of boys under 12 years of age. After 12 years of age, the incidence of migraine increases in females. Approximately 50 percent of all migraines begin before the age of 20 years.

There are thought to be four phases of migraine, first a Prodrome which is a set of symptoms including mental, neurologic or other medical complaints like excessive thirst or feeling cold which occurs for hours or days before the headache. Then there can be an "Aura" which is a set of neurologic features, such as change in vision, numbness, weakness, or language dysfunction that lasts for five to twenty minutes and immediately precedes the headache. However many people do not necessarily get a Prodrome or an Aura before their migraine. The headache of migraine can then last for hours to days with associated features of light, sound, smell, or motion sensitivity, dizziness, neck pain and a myriad of other symptoms. The headache itself can be on one side (60 percent) or the whole head (40 percent), and is typically pounding in nature though it can vary. It is not unusual for a migraine to produce nausea and vomiting and be totally incapacitating and disabling and these are features which readily differentiate migraine from tension type headache.

There are a number of known triggers for migraine including changes in weather or barometric pressure, stress and hormonal changes such as with ovulation, or menstruation. There are many known dietary triggers for migraine but not every migraneur is sensitive to all of them. Common triggers are Tyramine, a vasoactive neuropeptide that is commonly found in red wine and aged cheeses, such as Stilton or Roquefort. Nitrates which are typically found in most processed meats can also cause migraine headaches, and monosodium gluconate (MSG) is a common trigger and is found in canned foods and many Asian and prepared ethnic foods. Food triggers can also include caffeine, chocolate, nuts, and yeast products, so the only way to identify them as an individual trigger is the keeping of meticulous notes.

We now understand a lot about the pathology of migraine including the release of Neuropeptides such as Substance P, Calcitonin Gene Related Peptide, which create pain and interact with the vascular system in the brain to cause vasodilation (expansion) and plasma extravasation which then in turn causes more neurogenic inflammation and vascular dilation. If one measures electrical activity across the brain during a migraine, a spread depression of cortical activity can be identified indicating severe suppression of brain functional activity. This understanding of the pathology of migraine has led to significant advances in both treatment for acute migraine as well as interventions for prevention of recurrent or chronic migraines.

The understanding of the neuroinflammatory and neurovascular aspects of migraine led to the development of medications that trigger the 5-Hydroxytryptophan receptors in the brain (Serotonin). There are actually over 300 known Serotonin receptor subtypes in the brain. The subtypes 5-HT1(b) and 5-HT1(d) will cause vasoconstriction and are



the target for the class of drugs called "triptans," the most successful and widely prescribed medications for migraine today. Triptans are effective in over 80 percent of patients with migraines, which is quite an impressive number for medication responsiveness and there are currently seven FDA approved triptans for the treatment of migraine available today.

The American Headache Association recommends that if an individual suffers from four or more headache days each month then they should be a candidate for a preventative or prophylactic regimen. This is typically a prescribed medication that has been proven to reduce the frequency of migraine and include tricyclic antidepressants, non-specific betablockers and calcium channel blockers, and certain anticonvulsants. As well there have some studies that a B vitamin, Riboflavin, an herb, Butterbur, and also Magnesium can help with migraine prevention. Other approaches including biofeedback, acupuncture, and cranio-sacral therapy have also been studied with varying degrees of success in certain patients.

To conclude, the study of headache has advanced significantly since the time of trepanation and with the current recommended guidelines of classifying headache and the robust science regarding the most common headache type, Migraine, treatment should be available to reduce the frequency and severity of attacks as well as to terminate them in their tracks. Maybe one day we may even let a migraneur in the White House.

*For more information on migraine headaches or on other neurological issues, Dr. Rosenfeld may be reached at Neurology and Sleep Medicine located at SouthCoast Medical Group, 1326 Eisenhower Drive, Savannah, Georgia 31406 or you may call him at (912) 691-4100*