

## A Review Migraine

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### ABSTRACT

Headache disorders are among the most common nervous system ailments, which are characterized by persistent headaches. Headache is a severe and disabling symptom of a few major headache disorders, including migraine, tension-type headache, and cluster headache. Migraine is caused by spontaneous over activity and aberrant amplification in pain and other, primarily sensory, pathways in the brainstem. The current consensus is that the cause is predominantly neurological. According to current knowledge, a basic neuronal malfunction causes a series of intracranial and extra cranial alterations that cause migraine, comprising the four phases of premonitory symptoms, aura, headache, and postdrome. The effective diagnosis and treatment may help the patient improve in their quality of life and help to achieve an optimal therapeutic outcome. The scope of this review is to describe Migraine, types, etiology, pathophysiology, diagnosis, pharmacological treatment, non-pharmacological treatment, and its prevention.

**KEYWORDS:** Migraine, Etiology, Types, Pathophysiology, Diagnosis, Treatment

### INTRODUCTION

- [1,2] Headache disorders are among the most common nervous system ailments, which are characterized by persistent headaches. Headache is a severe and disabling symptom of a few major headache disorders, including migraine, tension-type headache, and cluster headache. Migraine is a severe primary headache disease.
- Migraine is really derived from a Greek word that means "half-head. The word migraine comes from the Greek word "hemikrania," which was later renamed "hemigranea" in Latin. "Migraine" is the French equivalent of such a word.
- In general, a migraine is a severe headache that tends to recur. It can happen multiple times every week or only once per few years. It can endure for a few hours to three days. The pain usually starts on one side of the head in the morning."
- The entire head is gobbled up by anguish less frequently. The intensity of the agony varies. Some headaches are minor, while others appear to be nearly intolerable. Obviously, the more severe the pain, the more difficult it is to carry out daily tasks, such as going to work or simply getting out of bed. Various people have varied pain tolerance

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- levels. Even a minor migraine can drive some people to lie down, while others can work through a more severe migraine [1,2]
- [3] Migraine is a genetically driven complicated condition characterized by episodes of moderate-to-severe headaches, which are usually unilateral and are frequently accompanied by nausea and increased sensitivity to light and sound.
- Migraine is a common cause of employment loss and impairment. Migraine episodes are a complex brain event that occurs in a repeated manner spanning hours to days. Migraine without aura is the most common form.[3]

### ETIOLOGY:

- [3] Migraine can be classified into subtypes, according to the headache classification committee of the International Headache Society:
- **MIGRAINE WITHOUT AURA:** Migraine without aura is a recurrent headache. Episode that lasts 4 to 72 hours. It is usually unilateral in nature, pulsing in quality, moderate to severe in severity. Its severity is increased by physical activity, and accompanied by nausea and light

sensitivity (Photophobia) and sound sensitivity (phonophobia).

- **MIGRAINE WITH AURA:** Migraine with aura is characterized by recurring, fully reversible attacks. It lasts a few minutes. It includes one or more of the following unilateral symptoms such as visual, sensory, motor, speech and language difficulties.
- Asymptomatic migraine occurs pain without symptoms
- **Episodic disorders:** Episodic disorders that could be linked to migraine
  - Recurrent gastrointestinal (GI) disturbances are migraine-related bouts of abdominal pain and discomfort, nausea, and vomiting.
  - Benign paroxysmal vertigo is characterized by recurring occurrences of vertigo that last only a few seconds.
  - Recurrent episodes of benign paroxysmal torticollis cause a head tilt to one side.

**Genetics and Inheritance:** The genetic basis of migraine is complex, and it's unclear which genes and loci are involved in the disease's pathogenesis.

**Familial Hemiplegic Migraine:** A hemiplegic migraine is an uncommon type of migraine in which the headache is accompanied by weakness on one side. [3]

#### **SIGN AND SYMPTOMS:**

[4,5] **Visual:** The visual symptoms that acquire in migraine with aura

Blind spots (scotomas), Zigzag lines that gradually float across your field of vision

- Shimmering spots or stars
- Changes in vision or vision loss
- Flashes of light

**Sensory:** Vision loss in part of one or both eyes

- Seeing zigzag patterns
- Seeing flashing lights
- Seeing, hearing, or smelling things that aren't really there
- Prickling, tingling, or numbness
- Trouble finding words or speaking

Problems with Motor and speech which are commonly followed by headache and migraine symptoms.

**Other Symptoms:** Other transient abnormalities that can occur as a result of a migraine aura include:

- Numbness, which starts as tingling in one hand or on one side of your face and spreads slowly down a limb.
- Speech or language impairment
- Muscle deterioration

- Upset stomach or vomiting
- Hot flashes and chills
- Stuffy or runny nose
- Dizziness or spinning
- Sore neck or jaw [4,5]

#### **PATHOPHYSIOLOGY:**

[6] There was once a vascular theory of migraine that explained how the headache was caused by vasodilation and the aura was caused by vasoconstriction, but this idea is no longer valid. Multiple primary neuronal deficits, according to current theories, cause a succession of intracranial and extracranial alterations that cause headaches. [6]

[7] Migraine is caused by spontaneous overactivity and aberrant amplification in pain and other, primarily sensory, pathways in the brainstem. The current consensus is that the cause is predominantly neurological, with feedback loops including the trigeminovascular system's innervation of cranial arteries. A relative deficit of 5-hydroxytryptamine (5-HT) could be at the root of the problem, and it's linked to how most drugs work. Some ongoing research is looking at the significance of calcium channel anomalies, as well as peptides such as calcitonin gene-related peptide, which may be closer to the underlying reason than 5-HT, which could lead to better treatment in the future. Migraine is frequently caused by a combination of factors. [7]

[8] According to current knowledge, a basic neuronal malfunction causes a series of intracranial and extracranial alterations that cause migraine, comprising the four phases of premonitory symptoms, aura, headache, and postdrome.

The once-popular vascular theory of migraine, which held that migraine headaches were produced by blood vessel dilation and migraine auras were caused by vasoconstriction, is no longer regarded as plausible. If vasodilation occurs at all during spontaneous migraine attacks, it is most likely an epiphenomenon caused by a malfunction in the central neurovascular control mechanism. [8]

[9] Vasoactive neuropeptides (substance P (SP), neurokinin A (NKA), calcitonin gene-related peptide (CGRP), and others) are released when the axons of the trigeminal neurons, which are situated around the dural arteries, are stimulated. Neurogenic inflammation (vasodilation, plasma protein leakage, and mast cell degranulation) arises as a result of these events.

In the trigeminal nerves, this generates both anterograde and retrograde conduction. [9]

## DIAGNOSIS:

[10] A neurologist diagnoses migraines based on medical history, symptoms, and a physical and neurological exam.

### Magnetic resonance imaging (MRI):

An MRI scan produces detailed images of the brain and blood arteries using a powerful magnetic field and radio waves. MRI scans assist doctors in the diagnosis of cancers, strokes, brain hemorrhage, infections, and other neurological diseases.

### A computerized tomography (CT) scan:

It creates comprehensive cross-sectional images of the brain using a succession of X-rays. This aids clinicians in the diagnosis of tumors, infections, brain injury, brain bleeding, and other medical issues that may be producing headaches.[10]

### Urinalysis and blood chemistry:

[11] Many medical issues, such as Diabetes, Thyroid problems, Infections that cause headaches, can be detected using these tests.[11]

### A lumbar puncture:

[12] It is also known as a spinal tap. It is a diagnostic procedure in which a tiny volume of cerebrospinal fluid—the fluid that surrounds the brain and spinal cord—is removed and analyzed from the lumbar (or lower) area of the spinal column.

A lumbar puncture is used to diagnose infections such as meningitis (infection of the membranes that cover the brain) and encephalitis (infection of the brain itself), inflammatory nervous system conditions such as Guillain-Barre syndrome and multiple sclerosis, bleeding around the brain (subarachnoid hemorrhage), and cancers of the brain and spinal cord.[12]

## TREATMENT:

### PHARMACOLOGICAL MANAGEMENT:

#### NSAIDs:

Eg: [13][14]

Ibuprofen

Acetyl salicylic acid

Diclofenac potassium

Naproxen sodium

In the treatment of acute migraines, over-the-counter analgesics are widely utilized. Non-steroidal anti-inflammatory drugs (NSAIDs) have been shown to be effective, and the strongest evidence supports the use of them as first-line therapies. Paracetamol is ineffective and should only be used by people who are intolerant to NSAIDs.

#### TRIPTAN:

Triptans operate by calming hyperactive nerves in the brain, which are produced by migraines. They also aid in the normalization of blood vessels.

This aids in the relief of migraine symptoms. Triptans are available in several dosage forms.

The dosage form of drug may depend on symptoms. For example, if nausea and vomiting with migraine, a nasal spray is recommended instead of pills to swallow.

### DOSAGE FORMS INCLUDE:

- Oral tablet that you swallow
- Oral, quick-dissolving tablet
- Nasal spray
- Injection

### ERGOTAMINE:

Ergotamine is an alpha-1 selective adrenergic agonist vasoconstrictor that is used to treat migraines and cluster headaches with or without aura.[13][14]

### Ubrogepant:

[15][16] This calcitonin gene-related peptide receptor antagonist is licensed to treat acute migraine in adults with or without aura.

It's the first medicine of its kind to be licensed for the treatment of migraines.

Ubrogepant was found to be more effective than placebo in alleviating pain and other migraine symptoms such as nausea and sensitivity to light and sound two hours after ingesting it in clinical trials.

### ADR:

Dry mouth

Nausea, and

Extreme tiredness are all common adverse effects.[15],[16]

### Lasmiditan:

[17] It is a unique migraine drug that is used to relieve pain when it arises.

It is the first migraine medicine to target the 5-hydroxytryptamine (5-HT<sub>1F</sub>) receptor for the acute treatment of migraine in adults with or without aura.

It enters the brain, stimulates this receptor, and stops migraine attacks in their tracks.[17]

### Oxycodone:

[18] Oxycodone is a pain reliever Oxycodone is an opioid analgesic that works in a similar way to morphine. It may, however, cause less constipation, smooth muscle spasm, and cough reflex depression than equal analgesic doses of morphine.[18]

### NON-PHARMACOLOGICAL MANAGEMENT:

#### A transcutaneous electrical nerve stimulation:

[19] It is a procedure that involves stimulating the nerves through the skin. It is a battery-powered, portable, pocket-sized device that adheres to the skin.

It is frequently applied to the painful area. To help manage pain, it uses modest, harmless electrical signals.[19]

#### **A spinal cord stimulator:**

[20] Patients experience pain alleviation as a result of spinal cord stimulation, which alters pain signals induced by headaches.

The stimulator delivers low-voltage electrical pulses to the epidural area, interrupting pain signals sent by the spinal nerves.

Patients with chronic headaches can have excellent pain relief because of the brain's lack of perception of pain signals.[20]

#### **SELF-HYPNOSIS:**

[21] Self-hypnosis has been demonstrated to be particularly beneficial in both treating and avoiding migraines in children and adolescents.

Patients realize that by using self-hypnosis, they may educate their minds to communicate with their bodies, allowing them to achieve even more control over their migraines.[21]

#### **ACUPUNCTURE:**

[21-24] Acupuncture is used to balance the energy flow (also known as "qi") along the meridians. Acupuncturists use needles to stimulate certain pressure points on a person's back or neck, which can help to reduce pain transmission.

The needles are sometimes accompanied by a light head massage. Patients are recommended to attend at least six sessions, usually once a week, and treatment takes around an hour.

Dietary adjustments may also be recommended by the acupuncturist.

#### **Temperature therapy:**

Compress your head or neck with hot or cold compresses. Ice packs have a numbing effect that might help to reduce pain.

Tense muscles can be relieved using hot packs and heating pads. Showers or baths that are warm may have a similar effect.

#### **Lifestyle Modifications:**

Maintain a healthy weight by doing 30 minutes of moderate exercise three to four times a week

Sleep for 7-8 hours per night on a regular basis.

Stress reduction is critical; Practise relaxation and meditation techniques on a daily basis, even if it just takes 5 minutes per day.

Tobacco should be avoided because it is pro-inflammatory and can be a trigger. [21-24]

#### **PREVENTION:**

[25]

Avoid loud noises and bright lights

Pay attention to food choices

Keep a headache diary

Beware of hormonal changes

Take supplements

Pay attention to the weather

Eat and sleep on a regular schedule [25]

#### **Conclusion:**

Headache disorders are among the most common nervous system ailments, which are characterized by persistent headaches. This review focuses on migraine, types, etiology, pathophysiology, diagnosis, pharmacological treatment, non-pharmacological treatment, and its lifestyle modification. Successful treatment of migraine is the understanding of the underlying pathophysiological process in the disease development. Patients who have migraine should take appropriate treatment and due to the complexity of this condition management of migraine conditions requires an inter professional team of health care professionals to achieve an optimal patient outcome

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