

A Brief Review: Migraine and its Treatment

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Abstract

Migraine remains the second leading cause of disability worldwide. Diagnosis is based on history, and physical examination and imaging studies are usually not necessary. Migraines can be classified by the presence or absence of blurring and the frequency of headache. The number of headache days determines whether a patient has episodic or chronic migraine. Migraine treatments can be used to treat migraines themselves and to prevent them from occurring. In this review we present the latest information on migraine management from a common perspective.

Keywords: Headache, Pain Attack, Migraine, Chronic Pain, Cortisol Diffuse Depression, Prophylaxis, Preventive Therapy, Treatment

INTRODUCTION:

This is a common arterial disease, especially in young women. Migraine affects 18 percent of women and 6 percent of men, while migraine affects 2 percent of the world's population.¹Treatment is based on pharmacological and non-pharmacological therapies. Pharmacologic interventions are designed to treat and prevent headaches.²

Migraines can be divided into 4 phases:

1. Interictal: The interictal period is characterized by migraine episodes.³
2. Preictal Phase: The preictal phase is characterized by the period before the onset of the headache, when prodromal symptoms such as appetite changes and yawning appear.³
3. IctalPhase: The attack phase begins with the onset of the headache and lasts 4 to 72 hours.⁴
4. Postictal: The postictal period is characterized by the period after the headache has ended, when nonhead symptoms such as confusion and fatigue (postictal) appear. In 2018, preictal and postictal phases were defined as the 48 hours before and 48 hours after the headache, respectively.⁵

Migraine is a central pain. This means that there is a defect in the central nervous system, as well as the brain and spinal cord, nerves and blood vessels that cause migraine-related pain and symptoms. People with migraine have lower serotonin levels.⁶ Serotonergic neurons in the nucleus accumbens of the brain change their electrical activity during the sleep-wake cycle, which may explain why sleep is the best antidote to migraine.⁴ Migraine Definition Migraine is a headache that usually causes severe pain or a throbbing sensation on one side of the head. It has symptoms of nausea, vomiting, and extreme sensitivity to light and sound. Chronic neurological disease characterized by headaches on one side of the head, including photophobia, phonophobia, nausea, and vomiting.⁷

Pathophysiology: Migraine is a common brain disorder that affects the central nervous system and the skull. Symptoms usually last 4 to 72 hours and can be severe.⁸ Migraine is a common familial disease whose main symptom is headache with some associated factors in (Tables 1 and 2).

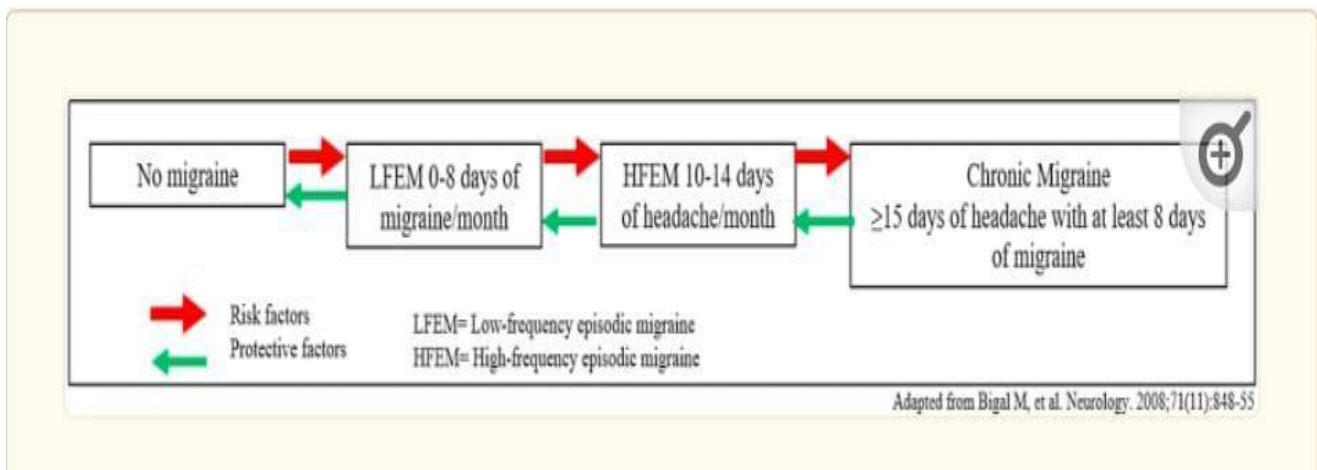


Fig: Process of Migraine

Table 1: Migraine characteristics in the International Classification of Headache Disorders. Second edition [85].
Recurrent headache attacks lasts from [4-72 hr] with following characters.

Any two of	Any one of
Unilateral	Nausea/Vomitting
Throbbing	Photophobia and phonophobia
Worsened by movement	-
Moderate or severe	-

Table 2: Neuro-anatomical treatment of Headache

Target Intervention:	Structure	Comments
Cranial vessels Dura mater	Ophthalmic branch of trigeminal nerve	-
1 st	Trigeminal ganglion	Middle cranial fossa
2 nd	Trigeminal nucleus (quintothalamic tract)	Trigeminal n. caudalis and C1/C2 dorsal horns
3 rd	Thalamus	Ventrobasalcomplex Medial n. of posterior group Intralaminar complex
Modulatory	Midbrain Hypothalamus	Periaqueductal grey matter Orexinergic Mechanisms
Final	Cortex	<ul style="list-style-type: none"> • Insulae • Frontal Cortex • Anterior cingulate cortex • Basal ganglia

Most important aspects of migraine:

1. Calcitonin gene-related peptide: CGRP is a neuropeptide that causes vasodilation in the brain and dura mater. It is an important part of migraine. CGRP also travels to the central nervous system via the intracranial nerves⁹
2. Cerebral and diencephalic vascular system: Dysfunction of these nuclei leads to the perception and activation of the trigeminal Vascular system, which carries sensory information from the cranial nerves to the heart.¹⁰
3. Brainstem and Diencephalon: Neuropeptides and inflammation of the dura mater and cranial nerves.¹¹
4. Generalized cortical depression: Depolarization of cerebral cortical neurons and glial cells causes migraine aura.¹²
5. Serotonin: Serotonin released from serotonergic nuclei in the brain may play a role in migraine.¹³

**Fig 1: Symptoms of Migraine****Clinical features:**¹⁴

1. Headache
2. Depression
3. Hyperactivity
4. Food Cravings
5. Repetitive Yawning
6. Tissue and Neck Stiffness

Diagnosis:¹⁵

1. Cranial nerve examination.
2. Headaches last 4 to 72 hours are moderate and frequent.
3. Urinalysis.
4. Complete blood count.

Treatment:**Non-Pharmacological Approches:**¹⁶

1. Relaxation Therapy.
2. Psychotherapy
3. Hypnosis, chiropractic care, osteopathy, and physiotherapy.

Lifestyle changes such as sleep, diet, stress, and exercise are known to be associated with migraine. A study of 350 migraineurs found that chronic migraineurs reduced their lifestyle habits in terms of sleep, exercise,

and diet more than migraineurs in the group. The relationship between headache and sleep is twofold: good sleep can increase the occurrence of migraine, and migraine can reduce good sleep.¹⁷

1. It is recommended to establish a regular and stable schedule. Regular rest and adequate rest at night are recommended because only the best sleep can turn migraine into episodic migraine.¹⁸
2. Stay hydrated, as dehydration can trigger migraines.¹⁹
3. Aerobic exercise: Evidence supports the prevention of regular exercise. Exercise (3 times per week, 40 minutes per session) was associated with topiramate in a study of 91 migraine patients who were randomly assigned to rest and the maximum dose of topiramate for 3 months. The results were similar, with no statistical difference.²⁰
4. Avoid stress.²¹
5. Avoid fasting.²²
6. Relaxation therapy, mindfulness therapy, and especially yoga. A recent clinical trial found benefits of yoga as an adjunctive treatment for migraine sufferers, resulting in better pain control, lower pain scores, and less medication use compared to no adjustment.²³

Pharmacological Approches:²⁴

1. 5 HT agonist
2. Beta blockers
3. Tricyclic antidepressants
4. Antiepileptic drug
5. Ergot alkaloid
6. Antiemetic
7. Nonsteroidal anti-inflammatory drugs.

One of the most important aspects of migraine treatment is to teach patients how to recognize migraine, as early treatment is essential to achieve an adequate response to end the attack.²⁵ Treatment should be stratified from the beginning, with drug selection according to the severity of symptoms, the characteristics of the treatment, and the patient's comorbidities.¹⁹ Migraine treatment can be divided into specific treatment, nonspecific treatment, and complementary treatment.²⁶ Good evidence supports the use of nonsteroidal anti-inflammatory drugs (NSAIDs) such as paracetamol, acetylsalicylic acid (ASA), ibuprofen, diclofenac, and dexketoprofen stopped. Acetaminophen (acetaminophen) is less potent in special cases and may be the drug of choice for the treatment of migraine pain for people with restrictions or intolerance to nonsteroidal anti-inflammatory drugs or aspirin. . And when there is an accident in childhood and no serious disability.²⁷

Table 3: Specific acute treatment

Treatment	Formulation and Dosage	For whom?
Eletriptan	40 mg tablet	Migraine associated with moderate to-severe intensity and recurrence .
Rizatriptan	10mg tablet Orally disintegrating tablet	Migraine associated with moderate to-severe intensity attacks of high intensity and short duration. Pain, or gastrointestinal symptoms which evolve rapidly.

Sumatriptan	50mg tablet 10/20 mg nasal spray 6 mg injection	Severe pain attacks resistance to the oral and nasal route. Oral resistance attacks. Pain, or gastrointestinal symptoms which evolve rapidly. Potential risk of pregnancy. Children and teenagers.
Zolmitriptan	5/2.5 mg tablet Orally disintegrating tablet 5/2.5 mg nasal spray	Standard attacks. Attacks which occurs during sleep. Pain, or gastrointestinal symptoms which evolve rapidly.
Almotriptan	12.5 mg tablet	Standard attacks. Intolerance t.o other triptans
Frovatriptan	2.5 mg tablet	Mild migraine of long durations(>24h) and frequent headache reoccurrence. Intolerance to other triptans.
Naratriptan	2.5 mg tablet	Mild migraine of long durations(>24h) and frequent headache reoccurrence.

Table 4: Prophylactic migraine treatment

Drug	Daily dose	Comments
Propranolol	40-240mg.	Episodic migraine. Risk of bradycardia, fatigue, erectile dysfunction. Of choice if anxiety or high blood pressure
Topiramate	50-200mg	Episodic and chronic migraine. Start 25 mg at bed time increases 25 mg per week. Attempt to reach 50-100 once or twice a day Avoid if depression.
Valproate	500-2000mg	Episodic migraine. Start 300-500mg usual dose is 600-1000 Teratogenic Gastrointestinal effects, alopecia, tremor weight gain are common

Amytriptiline	10-75	Episodic migraine. Start 10mg at bedtime increases 12.5-2.5 at every week. Antimuscarinic adverse effect and sedating
Flunarizine	5-10mg	Episodic migraine. Start 2.5 mg at bedtime gives effect with 5mg, good for vestibular migraine
Candesartan	8-16mg	Episodic migraine. Start in morning.

Treatment by Neurologists:

Injection: *OnabotulinumtoxinA* (*Botox^R*) this can only be given to patients who has headache of more than 15 days or a month.²⁸

Botox injection method depends on PREEMPT-[Phase 3 Research Evaluating Migraine Prophylaxis Therapy.]²⁹

There are 31 sites of injections and extra additional pain sites.³⁰
[5 units at each sites with 2.5 ml dilution per 100units.]^{31,32}

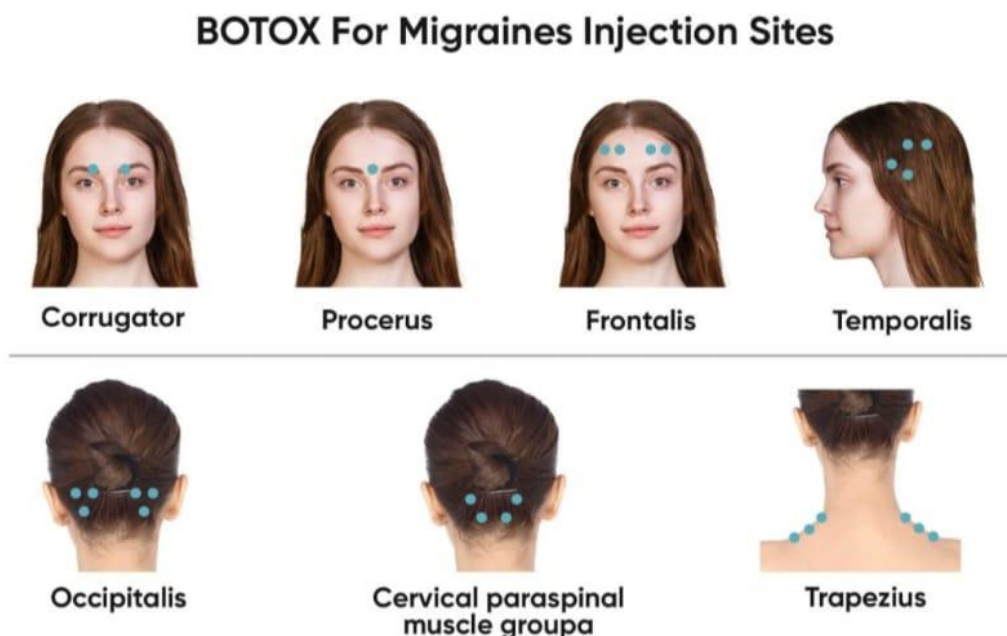


Fig 2: Botox Treatment

CONCLUSION:

Migraine is a headache. Early diagnosis and treatment can improve quality of life and prevent migraine from becoming chronic migraine. Indeed, interest in migraine pathophysiology continues, and new technologies and drugs that target different pathways are being discovered.

The complex and multifactorial nature of migraine is reflected by the presence of numerous risk factors and precipitating factors. In addition, evidence is accumulating that, in addition to psychiatric and psychological factors, various biological factors, particularly hormonal, genetic, and metabolic disorders, are risk factors for migraine.

Further research is needed to better understand the underlying biology of migraine. Identifying important biological and psychological factors and understanding the pathophysiological mechanisms may open new perspectives for prevention, redesign of treatment pathways, management planning, and personalized treatment strategies.

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