ejpmr, 2023, 10(9), 124-130

SJIF Impact Factor 6.222

EUROPEAN JOURNAL OF PHARMACEUTICAL AND MEDICAL RESEARCH

www.ejpmr.com

Review Article

ISSN 2394-3211

EJPMR

AN AYURVEDIC CORRELATION OF ARDHAVBHEDAK W.S.R TO MIGRAINE

Dr. Prateek Singh Thakur*[1], Dr. Jagruti Richhariya[2] and Dr. Rajendra Singh Patel[3]

[1]P.G. Scholar Department of Shalakya Tantra Mansarovar Ayurvedic Medical College Hospital & Research Centre, Bhopal (M.P.).

[2,3]Assistant Professor, Department of Shalakya Tantra Mansarovar Ayurvedic Medical College Hospital & Research Centre, Bhopal (M.P.).

***Corresponding Author: Dr. Prateek Singh Thakur**

P.G. Scholar Department of Shalakya Tantra Mansarovar Ayurvedic Medical College Hospital & Research Centre, Bhopal (M.P.).

Article Received on 21/07/2025 **Article Revised on 11/08/2023** **Article Accepted on 01/09/2023**

ABSTRACT

"Migraine is a disorder characterized by recurrent attacks of headache widely variable in intensity, frequency & duration. Attacks are commonly unilateral & are usually associated with anorexia, nausea & vomiting." The complex and largely unclear mechanisms of migraine development have resulted in the proposal of various social and biological risk factors, such as hormonal imbalances, genetic and epigenetic influences, as well as cardiovascular, neurological, and autoimmune diseases.

KEYWORDS: Migraine, epidemiology, risk factors, comorbidity, narrative review.

INTRODUCTION

A migraine is a headache that can cause severe throbbing pain or a pulsing sensation, usually on one side of the head. It's often accompanied by nausea, vomiting, and extreme sensitivity to light and sound. Migraine attacks can last for hours to days, and the pain can be so severe that it interferes with your daily activities. Migraine is a genetically influenced complex disorder characterized by episodes of moderate-to-severe headache, most often unilateral and generally associated with nausea and increased sensitivity to light and sound. The word migraine is derived from the Greek word "hemikrania," later converted into Latin as "hemigranea." The French translation of such a term is "migraine."

Prevalence

- Headache is common in urban areas.
- Prevalence rate of primary headache is 62.0%
- Prevalence rate of migrainous headache is 25.2% (Jan 2022).

Migraine affects an estimated **more than 10%** of people worldwide, occurs most often among people aged 20 to 50 years, and is about 3 times more common in women than in men. In a large US survey, 17.1% of women and 5.6% of men reported having migraine symptoms.

Survey Study

- Continuous reading.
- High sound/ noise pollution.
- Travelling.
- Oral contraceptive pills etc. have high risk of migraine.
- 70-80% of migraine sufferers having the family history of migraine.
- 68% feels like they are chasing a goal that they cannot reach, to get their disease under control.

Overall, **the incidence of migraine increased by 56% in women and 34% in men.** The most striking rate of increase was in women aged 20 to 50 years from 600 to 1000 new cases per 100,000 women per year. In men the same age, the rate increased from 200 to 250 per 100,000 men per year.

Largest Genetic study of migraine to date reveals new genetic risk factors

Scientists identified more than 120 regions of the genome that are connected to risk of migraine. The groundbreaking study helps researchers better understand the biological basis of migraine – Headache research new

Causes

(The exact cause is unknown)

It is caused by the activation of a mechanism deep in the brain that leads to release of pain producing inflammatory substances around the nerves and blood vessels of the head.

Migraine is recurrent, often life-long, and characterized by recurring attacks.

Migraine trigger factors
- Genetic factors
- Environmental factors
- Hormonal changes
- Weather changes
- Dehydration
- Nutrient changes
- Exacerbating drugs
- Lack of sleep (lifestyle changes)
- Dietary habits
- Caffeine
- Fasting
- Stress

Stress is the most common trigger of headaches and migraines. More than 70% of patients experience a high level of stress, leading up to a migraine. – (memorial herman.org)

Although exact mechanism is not known, the hypersensitivity to sensory stimuli may be due to dysfunctioning of mono aminergic sensory control system located in the brainstem & thalamus.

The trigeminal nerve fibres supplying the arteries and veins in the duramater are hyperactivated, so they release vasoactive neuropeptides as **CGRP(calcitonin related peptide)** in the duramater. Thus hyperactivated blood vessels produce pain by pressure. Some researches proved that muted calcium channel gene **CACN1A** is responsible for familiar hemiplegic migraine & thus establishes a hereditary factor for some type of migraines. Excess of serotonin & dopamine can also trigger migraine attacks & some antagonists against these hormones prevents migraine episodes.

Phases
- **Prodrome**
- **Aura**
- **Headache**
- **Postdrome**

1. Prodrome Phase
Vague pre-monitary symptoms that begin from 12-36 hrs before the aura & headache.

Symptoms
- Yawning
- Excitation
- Depression
- Lethargy
- Craving or distaste for various foods.

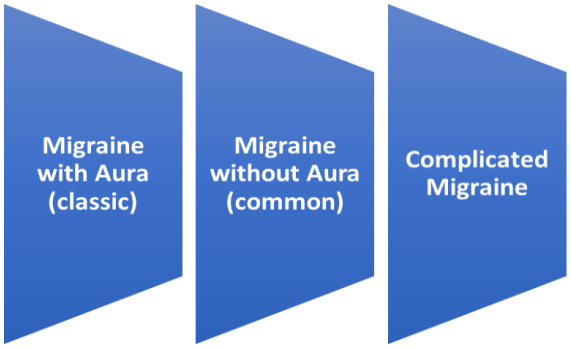
Duration- 15-20 mins.
2. Aura Phase
Aura is a warning or signal before onset of headache.

Symptoms
- Flashing of light
- Zigzag lines
- Difficulty in focusing

Duration- 15-30 mins.
3. Headache Phase
Headache is generally unilateral & is associated with symptoms like-
- Anorexia
- Nausea
- Vomiting
- Photophobia
- Phonophobia
- Tinnitus

Duration- 4-72 hrs.
4. Postdrome Phase
Following headache, patient complains of-
- Fatigue
- Depression
- Severe exhaustion
- Some patients feel unusually fresh.

Duration- Few hrs or upto 2 days.
Classification



Migraine without aura (common migraine)
- It causes throbbing pain on one side of the head.
- The pain is moderate to severe & get worse with normal physical activity.
- Nausea & vomiting.
- Worse around light & sound.

Duration:- 4-72 hrs (if not treated)

Migraine with aura (classic migraine)
- Aura upto 30 mins. before they have a migraine.

Symptoms
- Wavy lines, flashing lights or objects that look distorted.
- Tingling or 'Pin & needles' feeling.

Complicated migraines
- **Symptoms**

- Numbness & tingling.
- Trouble speaking or understanding speech.
- Not being able to move arm or leg.
- These symptoms go on after the headaches goes away.

Other Types

1. **Hemiplegic Migraine-** Symptoms of hemiplegia during attack.
2. **Ophthalmoplegic Migraine-** Symptoms with paralysis of eye muscles. Eye muscles remain normal in between attacks.
3. **Status Migrainosus-** Symptoms continues for several days or weeks.
4. **Retinal Migraine-** Loss of unilateral vision during attacks.
5. **Post-Traumatic Migraine-** Occur after a minor head injury or heading ball in soccer players.
6. **Symptomatic Migraine-** Caused by cerebral aneurysm or angioma.
7. **Basilar Migraine-** Occurs due to spasm of vertebro-basilar artery.

-Usually starts in 3rd decade.
-Vertigo, Diplopia, Facial tingling etc.
-Headache is usually occipital.

Signs & Diagnosis

- Medical History
- Lifestyle Details
- Headache Diary
- Migraine Triggers
- 5-4-3-2-1 Criteria
- Investigations

5-4-3-2-1 Criteria

According to International headache society (IHS) to confirm diagnosis for migraine without aura

- **5** or more- attacks per year
- **4** hrs to **3** days- duration
- **2** or more symptoms- Unilateral,

- Pulsating,
- Moderate to severe,
- Worsen by physical activity

1 or more of the following- Nausea & Vomiting,
- Sensitivity to light & sound

Investigations

- Blood Chemistry & Urine analysis
- C-T Scan
- M.R.I
- X-Ray
- Ophthalmic Examination

Treatmen

A. During attack

- Analgesics
- Antiemetics
- Ergotamine Preparations

B. Treatment to reduce the frequency & severity of subsequent attacks

- Avoidance precipitating factors.
- General sedatives & tranquillizers- Diazepam & prochlorperazine may be used if there is anxiety.
- Plenty of fluid intake.
- Pizotifen- 0.5mg TDS initially, used gradually to 3-6mg daily.

Common side effects- Weight gain & drowsiness.

- Clonidine- 20-50umg daily gradually used to 75umg TDS
- Methysergide- 2-6mg OD daily.
- Hormones- Progesterone may be given for last 8 days of menstrual cycle, if attack occurs in the immediate pre-menstrual period.
- Estrogen may be given in small dose as continuous therapy, when migraine begins or worse at the time of menopause.

CONCLUSION

Migraine is a complex neurological disorder characterized by recurrent episodes of moderate to severe headaches, often accompanied by other symptoms such as nausea, vomiting, sensitivity to light and sound, and visual disturbances. It is a common condition, affecting approximately 1 in 7 people worldwide. Migraine is believed to be caused by a combination of genetic and environmental factors. Changes in brain chemistry and activity, as well as abnormalities in the brain's blood vessels and nerves, are thought to play a role in triggering migraine attacks. However, the exact underlying mechanisms are still not fully understood.

There are several types of migraines, including migraine without aura (the most common type), migraine with aura (where individuals experience warning signs before the onset of a headache), and other less common variants. Migraines can have a significant impact on an individual's quality of life, often causing debilitating pain and interfering with daily activities.

Treatment for migraines typically involves a combination of preventive measures and acute attack management. Preventive strategies may include lifestyle modifications, identifying and avoiding triggers, managing stress, and taking medications regularly to reduce the frequency and severity of attacks. Acute attack management involves taking medications to relieve pain and other symptoms during an episode.

It's important for individuals with migraines to work closely with healthcare professionals to develop an individualized treatment plan that addresses their specific needs. In recent years, there have been advancements in migraine research and the development of new treatment options, including targeted medications that specifically address the underlying mechanisms of migraines.

While there is no known cure for migraines at present, ongoing research and advancements in understanding the condition hold promise for improved management and treatment options in the future. It's crucial to continue raising awareness about migraines, reducing stigma, and promoting support and understanding for those affected by this chronic condition.

अर्धावभेदक

थस्योत्तमांग अर्द्धवमतीवजन्तोः संभतोदभ्रंशूलजुष्टम ।
पक्षाद दशाहादथवाप्यकस्मातस्यार्द्धभेदं त्रित्यादवव्यस्येत ।।'(सु. उ. त. २५/१५)

जिस मनुष्य के शिर के आधे भाग में अत्यधिक भेद, तोद, भ्रम और शूल होता है। यह लक्षण अकस्मात् पन्द्रह दिनों में या दस दिन बाद हो जाते है। उसको अर्धावभेदक कहते है।

अर्धे तु मूधर्नः सोऽर्धावभेदक॥
पक्षातकुप्यति मासाद्वा स्वयमेव च शाम्यति | अतिवृद्धस्तु नयनं श्रवणं वा विनाशयेत॥ (अ.हृ.उ.-२३/७,८)

सिर के आधे भाग में पीड़ा होती है तो उसे अर्धावभेदक कहते हैं, इसी को "आधासीसी" भी कहते है| इसका प्रकोप १५ दिन पर अथवा १ मास में होता है या होता रहता हैं और किसी उपचार विशेष के बिना स्वयं शांत भी हो जाता हैं | यह रोग यदि अधिक बढ़ जाता हैं तो नेत्र तथा कान की (क्रमशः दर्शन एवं श्रवण) शक्ति को नष्ट कर डालता हैं |

शिरो रोगों का निदान

धुआँ, धूप, ओस, जलक्रीड़ा, अधिक सोना, रात्रिजागरण, शिरोभ्यंग न करना, निरंतर देखना, अधिक बोलने से प्रकुपित दोष शिर में जाकर रोगों शिरोरोग उत्पन्न करते है। ***(अ.हृ.उ.-२३/१,२)***

दोष प्रधानता

- आचार्यानुसार-
- सु.- त्रिदोषज
- च.- वातज, वातकफज
- वा.- वातज
- भा.प्र.- वात, कफ

सम्प्राप्ति

- निदान सेवन
- वात प्रकोप
- पित्त व कफ को साथ लेकर
- मन्या, भृकुटि, शंखप्रदेश, कर्ण, नेत्र, ललाट के आधे भाग में शस्त्र काटने के समान तीव्र वेदना उत्पन्न करती है
- शिर के आधे भाग को जकड़कर

लक्षण

- पंद्रह दिन या एक महीने के बाद लक्षण पुनः उत्पन्न होते है
- पीड़ा अत्यंत बढ़ जाये तो नेत्र और कर्ण को नष्ट कर देती है
- शस्त्र के समान काटने जैसी पीड़ा होना
- शिर के आधे भाग में पीड़ा होना।

चिकित्सा

- निदान परिवर्जन
- शोधन चिकित्सा
- संशमन चिकित्सा

शोधन चिकित्सा

- नाड़ी स्वेदन,
- शिरोविरेचन,
- शिरोबस्ति,
- दहन कर्म,
- रक्तमोक्षण,
- शिरोधारा।

संशमन चिकित्सा

एकल औषधियाँ

- पुराण घृत पान एवं नस्य,
- जटामांसी चूर्ण,
- अश्वगंधा चूर्ण,
- बकरे के मूत्र का नस्य (हारीत)
- पिप्पली कांड से ललाट के अंत में तथा शंख पर्यन्त एवं गर्दन में दहन कर्म करना चाहिए। (भेल संहिता)
- अपराजिता को कर्ण में बांधने से अर्धावभेदक नष्ट हो जाता है (यो.र.)

" शिरीषमूलकफलैरवपीडोऽनयोर्हितः "॥ (सु.उ.२५/३१)

सूर्यावर्त तथा अर्धावभेदक रोग में शिरीष की जड़ और फलों को पीसकर उनके स्वरस का अवपीड़न नस्य देना हितकर होता है|

औषध योग

- शिरशूलादि वज्र रस,
- मिहिरोदय रस,
- सिद्धामृत रस,
- गोदन्ती भस्म,
- कपर्द भस्म,
- स्वर्णमाक्षिक भस्म,
- कामदुधा रस,
- पथ्यादि क्वाथ,
- अश्वगंधारिष्ट,

- षडबिन्दु तैल,
- लाक्षादि तैल।

अन्य औषधियाँ

- गुड़ और सौंठ के कल्क का नस्य से शिर:शूल ठीक हो जाता है।
- वायविडंग तथा काले तिल, इन दोनों को पीस कर प्रलेप करने से, तथा इसी को निचोड़कर नस्य देने से शिर:शूल ठीक हो जाता है।
- चूना तथा नवसादर मिलकर सूंघने से शिर: शूल तुरंत नष्ट हो जाता है।
- कुमकुम (केसर) को घी में भूनकर नस्य देने से शिर:शूल नष्ट हो जाता है।

पथ्यापथ्य

पथ्य

- पुराणघृत,
- साठी धान,
- दुग्ध,
- किशमिश,
- बथुआ,
- करेला,
- आंवला,
- आम,
- तिल,
- तक्र,
- नारियल पानी,
- शर्करा मिश्रित दुग्ध,
- घृतकुमारी,
- भृंगराज,
- चन्दन।

अपथ्य

- छींक, ज़म्भा, निद्रा,मूत्र, मल के वेग को धारण करना,
- दिवास्वप्न,
- रात्रिजागरण,
- जल क्रीड़ा,
- लकड़ी का दातुन,
- विरुद्ध भोजन।

घरेलू नुस्खे \ home remedies

- दालचीनी- पीसकर १/२ घंटे तक माथे पर लगाए |
- देसी घी का नस्य
- गुड़ और दूध का सेवन
- मावा बाटी का सेवन
- जलेबी का सेवन

REFERENCES

1. De Fusco M, Marconi R, Silvestri L, Atorino L, Rampoldi L, Morgante L, et al. Haploinsufficiency of ATP1A2 encoding the Na+/K+ pump α2 subunit associated with familial hemiplegic migraine type 2. *Nat Genet*, 2003; 33: 192–6. 10.1038/ng1081 [PubMed] [CrossRef] [Google Scholar]
2. Dichgans M, Freilinger T, Eckstein G, Babini E, Lorenz-Depiereux B, Biskup S, et al.. Mutation in the neuronal voltage-gated sodium channel SCN1A in familial hemiplegic migraine. *Lancet*, 2005; 366: 371–7. 10.1016/S0140-6736(05)66786-4 [PubMed] [CrossRef] [Google Scholar]
3. Ophoff RA, Terwindt GM, Vergouwe MN, Van Eijk R, Oefner PJ, Hoffman SM, et al.. Familial hemiplegic migraine and episodic ataxia type-2 are caused by mutations in the Ca2+ channel gene CACNL1A4. *Cell*, 1996; 87: 543–52. 10.1016/S 0092-8674(00)81373-2 [PubMed] [CrossRef] [Google Scholar]
4. Ferrari MD, Klever RR, Terwindt GM, Ayata C, van den Maagdenberg AM. Migraine pathophysiology: lessons from mouse models and human genetics. *Lancet Neurol*, 2015; 14: 65–80. 10.101 6/S1474-4422(14)70220-0 [PubMed] [CrossRef] [Google Scholar]
5. Anttila V, Stefansson H, Kallela M, Todt U, Terwindt GM, Calafato MS, et al. Genome-wide association study of migraine implicates a common susceptibility variant on 8q22. 1. *Nat Genet*, 2010; 42: 869. 10.1038/ng.652 [PMC free article] [PubMed] [CrossRef] [Google Scholar]
6. Anttila V, Winsvold BS, Gormley P, Kurth T, Bettella F, McMahon G, et al.. Genome-wide meta-analysis identifies new susceptibility loci for migraine. *Nat Genet*, 2013; 45: 912–7. 10.1038/ng.2 676 [PMC free article] [PubMed] [CrossRef] [Google Scholar]
7. Chasman DI, Schürks M, Anttila V, de Vries B, Schminke U, Launer LJ, et al. Genome-wide association study reveals three susceptibility loci for common migraine in the general population. *Nat Genet*, 2011; 43: 695–8. 10.1038/ng.856 [PMC free article] [PubMed] [CrossRef] [Google Scholar]
8. Chen SP, Fuh JL, Chung MY, Lin YC, Liao YC, Wang YF, et al. Genome-wide association study identifies novel susceptibility loci for migraine in Han Chinese resided in Taiwan. *Cephalalgia*, 2018; 38: 466–75. 10.1177/0333102417695105 [PubMed] [CrossRef] [Google Scholar]
9. Freilinger T, Anttila V, De Vries B, Malik R, Kallela M, Terwindt GM, et al. Genome-wide association analysis identifies susceptibility loci for

migraine without aura. *Nat Genet,* 2012; 44: 777–82. 10.1038/ng.2307 [PMC free article] [PubMed] [CrossRef] [Google Scholar]
10. Gormley P, Anttila V, Winsvold BS, Palta P, Esko T, Pers TH, et al. Meta-analysis of 375,000 individuals identifies 38 susceptibility loci for migraine. *Nat Genet,* 2016; 48: 856–66. 10.1038/ng.3598 [PMC free article] [PubMed] [CrossRef] [Google Scholar]
11. Eising E, Datson NA, van den Maagdenberg AM, Ferrari MD. Epigenetic mechanisms in migraine: a promising avenue? *BMC Med,* 2013; 11: 26. 10.1186/1741-7015-11-26 [PMC free article] [PubMed] [CrossRef] [Google Scholar]
12. Gerring ZF, McRae AF, Montgomery GW, Nyholt DR. Genome-wide DNA methylation profiling in whole blood reveals epigenetic signatures associated with migraine. *BMC Geno,* 2018; 19: 69. 10.1186/s12864-018-4450-2 [PMC free article] [PubMed] [CrossRef] [Google Scholar]
13. Amir RE, Van den Veyver IB, Wan M, Tran CQ, Francke U, Zoghbi HY. Rett syndrome is caused by mutations in X-linked MECP2, encoding methyl-CpG-binding protein 2. *Nat Genet,* 1999; 23: 185–8. 10.1038/13810 [PubMed] [CrossRef] [Google Scholar]
14. Gibbons R. Alpha thalassaemia-mental retardation, X linked. *Orphanet J Rare Dis.,* 2006; 1: 15. 10.1186/1750-1172-1-15 [PMC free article] [PubMed] [CrossRef] [Google Scholar]
15. Tsankova NM, Berton O, Renthal W, Kumar A, Neve RL, Nestler EJ. Sustained hippocampal chromatin regulation in a mouse model of depression and antidepressant action. *Nat Neurosci,* 2006; 9: 519–25. 10.1038/nn1659 [PubMed] [CrossRef] [Google Scholar]
16. Minen MT, De Dhaem OB, Van Diest AK, Powers S, Schwedt TJ, Lipton R, et al. Migraine and its psychiatric comorbidities. *J Neurol Neurosurg Psychiatry,* 2016; 87: 741–9. 10.1136/jnnp-2015-312233 [PubMed] [CrossRef] [Google Scholar]
17. Radat F, Swendsen J. Psychiatric comorbidity in migraine: a review. *Cephalalgia,* 2005; 25: 165–78. 10.1111/j.1468-2982.2004.00839.x [PubMed] [CrossRef] [Google Scholar]
18. Peroutka SJ. What turns on a migraine? A systematic review of migraine precipitating factors. *Curr Pain Headache Rep.,* 2014; 18: 454. 10.1007/s11916-014-0454-z [PubMed] [CrossRef] [Google Scholar]
19. Dresler T, Caratozzolo S, Guldolf K, Huhn J-I, Loiacono C, Niiberg-Pikksööt T, et al.. Understanding the nature of psychiatric comorbidity in migraine: a systematic review focused on interactions and treatment implications. *J Headache Pain,* 2019; 20: 51. 10.1186/s10194-019-0988-x [PMC free article] [PubMed] [CrossRef] [Google Scholar].
20. Dodick DW. Migraine. *Lancet,* 2018; 391: 1315–30. 10.1016/S0140-6736(18)30478-1 [PubMed] [CrossRef] [Google Scholar]
21. Peterlin BL, Gupta S, Ward TN, MacGregor A. Sex matters: evaluating sex and gender in migraine and headache research. *Headache J Head Face Pain,* 2011; 51: 839–42. 10.1111/j.1526-4610.2011.01900.x [PMC free article] [PubMed] [CrossRef] [Google Scholar]
22. Buse DC, Silberstein SD, Manack AN, Papapetropoulos S, Lipton RB. Psychiatric comorbidities of episodic and chronic migraine. *J Neurol,* 2013; 260: 1960–9. 10.1007/s00415-012-6725-x [PubMed] [CrossRef] [Google Scholar]
23. Delaruelle Z, Ivanova TA, Khan S, Negro A, Ornello R, Raffaelli B, et al. Male and female sex hormones in primary headaches. *J Headache Pain.,* 2018; 19: 117. 10.1186/s10194-018-0922-7 [PMC free article] [PubMed] [CrossRef] [Google Scholar]
24. Tiseo C, Vacca A, Felbush A, Filimonova T, Gai A, Glazyrina T, et al.. Migraine and sleep disorders: a systematic review. *J Headache Pain,* 2020; 21: 126. 10.1186/s10194-020-01192-5 [PMC free article] [PubMed] [CrossRef] [Google Scholar]
25. Kelman L, Rains JC. Headache and sleep: examination of sleep patterns and complaints in a large clinical sample of migraineurs. *Headache J Head Face Pain,* 2005; 45: 904–10. 10.1111/j.1526-4610.2005.05159.x [PubMed] [CrossRef] [Google Scholar]
26. Pavlovic JM, Buse DC, Sollars CM, Haut S, Lipton RB. Trigger factors and premonitory features of migraine attacks: summary of studies. *Headache J Head Face Pain,* 2014; 54: 1670–9. 10.1111/head.12468 [PubMed] [CrossRef] [Google Scholar]
27. Gross EC, Lisicki M, Fischer D, Sándor PS, Schoenen J. The metabolic face of migraine—from pathophysiology to treatment. *Nat Rev Neurol,* 2019; 15: 627–43. 10.1038/s41582-019-0255-4 [PubMed] [CrossRef] [Google Scholar]
28. Boardman HF, Thomas E, Millson DS, Croft P. Psychological, sleep, lifestyle, and comorbid associations with headache. *Headache J Head Face Pain,* 2005; 45: 657–69. 10.1111/j.1526-4610.2005.05133.x [PubMed] [CrossRef] [Google Scholar]
29. Peres M, Zukerman E, Young W, Silberstein S. Fatigue in chronic migraine patients. *Cephalalgia,* 2002; 22: 720–4. 10.1046/j.1468-2982.2002.00426.x [PubMed] [CrossRef] [Google Scholar]
30. Giannini G, Cevoli S, Sambati L, Cortelli P. Migraine: risk factor and comorbidity. *Neurol Sci,* 2012; 33: 37–41. 10.1007/s10072-012-1029-6 [PubMed] [CrossRef] [Google Scholar]
31. D'Andrea G, Ostuzzi R, Francesconi F, Musco F, Bolner A, d'Onofrio F, et al.. Migraine prevalence in eating disorders and pathophysiological correlations. *Neurol Sci.,* 2009; 30: 55. 10.1007/s10072-009-0070-6 [PubMed] [CrossRef] [Google Scholar]

32. Mustelin L, Raevuori A, Kaprio J, Keski-Rahkonen A. Association between eating disorders and migraine may be explained by major depression. *Int J Eating Dis.*, 2014; 47: 884–7. 10.1002/eat.22311 [PubMed] [CrossRef] [Google Scholar]
33. Seidel S, Karwautz A, Wagner G, Zormann A, Eder H, Huemer J, et al.. Migraine in patients with eating disorders: a study using a sister-pair comparison design. *Headache J Head Face Pain*, 2011; 51: 220–5. 10.1111/j.1526-4610.2010.01822.x [PubMed] [CrossRef] [Google Scholar]
34. Razeghi Jahromi S Ghorbani Z Martelletti P Lampl C Togha M On On behalf of the School of Advanced Studies of the European Headache F. Association of diet and headache. *J Headache Pain*, 2019; 20: 106. 10.1186/s10194-019-1057-1 [PMC free article] [PubMed] [CrossRef] [Google Scholar]
35. Schürks M, Rist PM, Bigal ME, Buring JE, Lipton RB, Kurth T. Migraine and cardiovascular disease: systematic review and meta-analysis. *BMJ.*, 2009; 339: b3914. 10.1136/bmj.b3914 [PMC free article] [PubMed] [CrossRef] [Google Scholar]
36. Pezzini A, Zotto ED, Giossi A, Volonghi I, Grassi M, Padovani A. The migraine-ischemic stroke connection: potential pathogenic mechanisms. *Curr Mol Med*, 2009; 9: 215–26. 10.2174/156652409787581583 [PubMed] [CrossRef] [Google Scholar]
37. Chen D, Willis-Parker M, Lundberg GP. Migraine headache: is it only a neurological disorder? Links between migraine and cardiovascular disorders. *Trends Cardiovasc Med*, 2019; 30: 424–30. 10.1016/j.tcm.2019.10.005 [PubMed] [Cross Ref] [Google Scholar]
38. Linstra KM, Ibrahimi K, Terwindt GM, Wermer MJ, MaassenVanDenBrink A. Migraine and cardiovascular disease in women. *Maturitas*, 2017; 97: 28–31. 10.1016/j.maturitas.2016.12.008 [PubMed] [CrossRef] [Google Scholar]
39. MacClellan LR, Giles W, Cole J, Wozniak M, Stern B, Mitchell BD, et al.. Probable migraine with visual aura and risk of ischemic stroke: the stroke prevention in young women study. *Stroke*, 2007; 38: 2438–45. 10.1161/STROKEAHA.107.488395 [PubMed] [CrossRef] [Google Scholar]
40. Lee MJ, Lee C, Chung C-S. The migraine–stroke connection. *J Stroke*, 2016; 18: 146. 10.5853/jos.2015.01683 [PMCfree article] [PubMed] [CrossRef] [Google Scholar]
41. Alqaqa A. The association of cardiovascular disease and migraine: review. *J Clini Exp Cardiol*, 2016; 7: 465. 10.4172/2155-9880.1000465 [CrossRef] [Google Scholar]