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Why Is Migraine More Common in Women Than Men?

Analysis by Dr. Joseph Mercola | November 10, 2026

STORY AT-A-GLANCE

- Migraines affect women three to four times more often than men, in part due to hormonal fluctuations that sensitize the brain's pain pathways and increase vulnerability to stress, poor sleep, and inflammation
- Estrogen may prime and trigger migraine attacks — high levels heighten sensitivity, while sudden drops before menstruation or after childbirth can cause the electrical instability that sparks pain
- Natural progesterone may help counteract estrogen's pro-inflammatory effects, calming nerve excitability and possibly reducing migraine frequency during hormonally active years
- Mitochondrial dysfunction may be an important driver of migraines; reducing linoleic acid from seed oils and restoring nutrients like magnesium, CoQ10, and B vitamins may help strengthen your brain's energy supply and resilience
- Supporting melatonin through morning sunlight, minimizing blue light exposure at night, and maintaining oral and circadian health may help lower inflammation, support migraine prevention, and improve overall brain function

Migraines aren't just headaches — they're a full-body storm that hijacks your senses, drains your energy, and derails your day. The pain is often piercing or throbbing, but what makes migraines especially disruptive is how they affect your thinking, mood, and ability to function. Even ordinary things like light, sound, or certain smells often feel unbearable during an attack.

For millions of women — who experience migraines three to four times more often than men[1] — these episodes are recurring events that reshape daily life, work, and relationships. Rather than being confined to one system of your body, migraines start in your brain's electrical and vascular networks and spread outward, involving nerves that control sensation, vision, and balance.

Over time, frequent attacks exhaust your body's energy supply, strain your stress response, and interfere with sleep, setting up a cycle that's hard to break.

Researchers suggest that this condition has as much to do with how your brain handles energy and hormones as it does with pain itself. Differences in brain wiring, cellular metabolism, and hormonal rhythms make women especially vulnerable, but they also point to possible pathways for prevention. Understanding these underlying drivers helps you see migraines not as random attacks but as signals from an overtaxed system ready for repair.

Hormones Help Drive the Gender Gap in Migraines

Before puberty, boys and girls experience migraines at roughly the same rate, but as estrogen levels rise and fluctuate through adolescence, the difference becomes dramatic. An article published in The Conversation highlights that as many as 1 in 3 women in Australia live with migraines, compared to only 1 in 15 men — a disparity tied — in part — to hormonal changes after puberty.[2]

- **Migraine attacks are linked to specific phases of a woman's life when hormones swing the most —** Women often notice that migraine episodes cluster around predictable "milestone moments," such as puberty, menstruation, pregnancy, and perimenopause. Each of these phases is marked by changes in **estrogen**. These hormonal rollercoasters may make the female brain more vulnerable to energy depletion, sensory overload, and inflammation — all factors that intensify pain perception.

The late Dr. Ray Peat, a pioneer in bioenergetic medicine, long proposed that excess estrogen plays a central role in triggering migraines — and modern research has begun to explore that idea, although findings on estrogen remain mixed.

Research published in Frontiers in Molecular Biosciences reviewed mostly laboratory and animal evidence suggesting that estrogen heightens the sensitivity of cells surrounding the trigeminal nerve — the major nerve that controls facial sensation and pain — and nearby blood vessels, amplifying pain signals that can lead to migraine attacks.[3]

Because estrogen peaks during a woman's reproductive years, this may also help explain why migraines are not only far more common in women but most prevalent during this stage of life. The same research noted that progesterone appears to have a protective effect. This fits the idea that estrogen plays a role, since natural progesterone counterbalances estrogen's effects.

- **Fluctuating estrogen can alter brain activity and pain signaling —** Sudden hormone drops can also trigger a wave of abnormal electrical activity known as cortical spreading depression — a slow electrical ripple that temporarily disables normal brain function.[4] This wave helps explain why migraine symptoms go beyond head pain and often involve dizziness, nausea, or sensitivity to light.

  At the same time, when estrogen dips, it can change how the trigeminal nerve processes signals, heightening sensitivity and contributing to the throbbing pain that defines a migraine. This connection might seem like a contradiction: how can both a high level and a sudden drop in estrogen cause trouble? Think of it this way: High estrogen is like pressing the "sensitivity" button on your brain's pain control panel, turning the volume up to maximum.

  It doesn't cause the attack yet, but it primes your system for pain. The sudden drop in estrogen — the withdrawal — is the actual trigger; it's the moment someone yanks the plug from the wall. That shock to the already hyper-sensitive system can set off the electrical chaos (cortical spreading depression) and the resulting migraine.

- **Pregnancy and menopause each reshape migraine patterns in distinct ways —** During early pregnancy, when hormones shift rapidly to sustain fetal growth, migraines often become more intense or unpredictable. However, as pregnancy progresses and hormone levels stabilize, many women notice their attacks ease. After birth, the sudden hormonal drop often reignites migraine episodes.

  Perimenopause, the transitional period before menopause, brings another unpredictable phase — random surges of estrogen from the ovaries often trigger new or worsened attacks. Yet, once menopause is reached and hormone levels flatten, many women experience partial or total relief, illustrating how stability of estrogen matters most.

- **Mitochondrial inheritance may help explain why migraine tends to run in maternal family lines —** The Conversation also discussed how genetics — and specifically mitochondria — help explain why migraines frequently appear in mothers, daughters, and granddaughters. Mitochondria are the tiny energy generators inside cells that produce adenosine triphosphate (ATP), your body's main energy currency. They're inherited only from your mother.

  People with migraines have fewer functional enzymes within their mitochondria, meaning their brains operate in a state of energy deficit. When additional stress — like lack of sleep, poor diet, or hormonal swings — further drains this energy supply, a migraine can be triggered. This insight links hormonal instability with cellular energy dysfunction, showing why migraine management needs to address both.

Brain Structure and Stress Patterns Can Help Explain Women's Migraine Burden

A narrative review published in Neurological Sciences explored how biological and social differences between men and women influence migraine risk, symptoms, and treatment outcomes.[5]

The review found that global migraine prevalence is 20.7% in women and 9.7% in men, with even larger gaps in countries like Italy, where 32.9% of women and only 13% of men experience the condition. These numbers show why women often face greater daily disruption, lost workdays, and emotional strain from chronic migraine than men.

- **Women experience longer and more disabling attacks than men —** According to the review, female migraine sufferers report longer episodes, higher recurrence rates, and slower recovery compared with males. Women are also 1.34 times more likely to fall into the highest category of migraine-related disability.

  The researchers link these differences to hormonal effects, different reactions to pain, and structural and functional differences in brain areas that process pain, along with genetic, behavioral, and nutritional factors. Still, they note that the reasons for the gap remain unclear.

- **Workplace stress and sleep disruption compound migraine risk —** The review also highlighted how night shifts, irregular sleep patterns, and emotionally demanding roles influence migraine risk. Shift work disrupts your circadian rhythm — your body's natural sleep-wake cycle — which affects hormonal regulation and brain energy metabolism. People working fixed evening shifts had 56% higher odds of seeking migraine treatment compared to daytime workers.[6]

- **Environmental triggers at work create a hidden layer of risk —** People exposed to bright lights, chemical odors, or poor air quality in workplaces reported more frequent headaches. The study linked these environmental stressors to "sick building syndrome," a condition where prolonged exposure to indoor pollutants worsens symptoms until leaving the environment brings relief.

- **Hormones, genetics, and environment combine to shape women's migraine risk —** The Global Burden of Disease study ranked migraine as the fourth leading cause of years lived with disability for women, compared with eighth for men, according to a report from the University of Colorado Anschutz Medical Campus.[7]

Dr. Danielle Wilhour, assistant professor in the department of neurology, noted that about 50% to 60% of women with migraine experience menstrual-related attacks. Women with migraine also more often struggle with anxiety and depression, while men tend to experience physical comorbidities such as obesity.

The featured report also notes that women are more inclined than men to use preventive treatments to reduce how often migraines strike. Neuromodulation devices, which deliver mild electrical impulses to nerves in the head or neck to interrupt pain signals, are a drug-free option. These tools offer alternatives for those who want to avoid migraine medications or reduce side effects.

Excess Linoleic Acid Intake May Contribute to Migraines

While hormones and genetics play a role, many migraines may stem from a deep-rooted problem in your mitochondria — and one of the biggest saboteurs of mitochondrial health is excess **linoleic acid** (LA). This polyunsaturated fat, abundant in seed oils and other ultraprocessed foods, can act as a mitochondrial toxin when consumed in excess, disrupting your cells' ability to produce energy efficiently.

- **Excess LA damages your mitochondria, fueling inflammation and pain —** When LA oxidizes, it forms toxic byproducts. These compounds attack mitochondrial membranes and proteins, blocking normal energy production. With less ATP, your brain may become more vulnerable to migraine attacks.

- **Damaged cardiolipin disrupts energy flow inside your cells —** Cardiolipin, a specialized fat in the inner membrane of your mitochondria, is essential for forming "supercomplexes" that generate energy.

  When too much LA replaces the healthier omega-3 fats that should be there, cardiolipin loses its structure and no longer supports efficient ATP production. The result: sluggish energy metabolism and increased oxidative stress, both of which may prime your brain for migraine pain.

- **Impaired cell renewal lets damaged cells persist —** Healthy cardiolipin also triggers apoptosis — the process of clearing out malfunctioning cells. When oxidized LA damages cardiolipin, this self-cleaning mechanism can fail, allowing defective cells to survive and perpetuate inflammation and dysfunction.

- **Processed seed oils are the main culprits —** The most common sources of LA are vegetable, or seed, oils (soybean, corn, safflower, sunflower, canola), fried and processed foods, restaurant meals, and grain-fed meats like conventional pork and chicken.

  Even many olive and avocado oils are adulterated with cheaper seed oils. Although reducing your total LA burden takes time, early benefits may appear within weeks as healthier fats replace damaged ones in your mitochondria. Ideally, keep your LA intake between 2 and 5 grams a day from all sources — LA is still an essential fat, so don't aim for zero intake. You can figure out how much you're consuming with my upcoming **PAX app**.

Practical Steps to Restore Mitochondrial Health and Prevent Hormone-Driven Migraines

If you're living with migraines, you already know how unpredictable and exhausting they are. What's less obvious is that the pain often starts deep inside your cells. When your mitochondria struggle to make enough energy, your brain may become more reactive to stress, hormones, and environmental triggers. Restoring mitochondrial health, balancing hormones, and protecting your nervous system are key steps toward relief.

1. **Reduce LA to protect your mitochondria —** Excess LA damages your mitochondria and may have estrogen-like effects, which could contribute to migraines. To protect your brain's energy system and stabilize hormones, keep LA between 2 and 5 grams a day by avoiding seed oils like soybean, corn, safflower, sunflower, canola, and cottonseed, along with fried, processed, and restaurant foods made with them. Choose stable fats such as grass fed butter, ghee, or tallow instead.

To track your intake, I recommend you download my **PAX app** when it becomes available. It has a feature called the Seed Oil Sleuth, which monitors your LA intake to a tenth of a gram. Lowering LA may help your mitochondria recover, reduce inflammation, and lessen migraine frequency.

In a 2021 randomized trial in adults with migraine, a diet that lowered LA and raised omega-3 fats cut headache days by about four a month compared with a control diet, and by about two more days a month than raising omega-3s alone. Note, however, that it didn't significantly improve quality-of-life scores.[8]

2. **Support melatonin — your brain's built-in antioxidant —** Melatonin does much more than regulate sleep. Most of your body's melatonin is produced inside your mitochondria in response to near-infrared light. It helps shield your brain at the cellular level by neutralizing free radicals and calming inflammation that may drive migraine pain. To optimize it naturally:

    - Get bright morning sunlight to anchor your circadian rhythm — this raises alertness during the day and boosts melatonin release at night.
    - Limit blue light exposure after sunset by dimming lights, using incandescent or salt lamps, and wearing blue-blocking glasses if you use screens.
    - Sleep in total darkness to allow full melatonin release overnight. In a systematic review, observational studies of melatonin supplements found average drops of 51% in headache frequency, 53% in intensity, and 46% in duration, although results from controlled trials were mixed. The authors called melatonin a promising option for migraine prevention.[9]

    Note: These findings are from research conducted in clinical settings. Results may not apply to all individuals.

3. **Rebuild your nutrient reserves to fortify brain energy —** Migraines are often linked to deficiencies in magnesium, B vitamins (especially B2, B6, folate, and B12), vitamin D, and coenzyme Q10 (CoQ10). These nutrients are essential for healthy

mitochondrial energy production and nerve function.

If you struggle with frequent migraines, increase your intake of magnesium-rich foods like leafy greens and consider magnesium glycinate or malate. To find your dose, take magnesium citrate and increase it until your stools loosen, then back off slightly and switch to glycinate or malate.

For severe cases, intravenous (IV) magnesium, given by a healthcare provider, can help stop an attack midstream. CoQ10 supports the same energy pathways and may work best when paired with magnesium over several months. Always aim to meet most of your nutrient needs through whole foods first — the exception being magnesium, because many are deficient and benefit from supplementation.

4. **Care for your mouth to reduce inflammation throughout your body —** Poor oral health may be a hidden contributor to migraines. A 2025 study of women in New Zealand, most of whom had fibromyalgia, found that those with migraines were more likely to report poor oral health, although it couldn't show that one caused the other.[10] Use a gentle, fluoride-free toothpaste, skip alcohol-based mouth rinses, and brush your tongue daily or use a tongue scraper.

   Oil pulling with coconut oil daily may help draw out bacteria and support oral detoxification. Visit a biological dentist twice yearly for deep cleanings and comprehensive exams — small improvements in oral health can help lower your overall inflammation load.

5. **Find your personal triggers — and balance your hormones naturally —** No two migraines are exactly alike, but tracking your patterns can help you predict them and act early. Keep a detailed migraine diary that records your sleep, stress, meals, weather changes, and menstrual cycle.

   Over time, you'll start to see clear connections between hormonal shifts and migraine attacks. Once you know when your triggers occur, you can act early — hydrating more, stabilizing your meals, or using stress-reduction techniques before symptoms begin.

For women whose migraines are clearly linked to hormonal fluctuations, supporting natural progesterone balance may make a meaningful difference. Natural progesterone may help calm brain excitability and offset the pro-inflammatory effects of excess estrogen that often trigger migraine pain.

If you're considering natural progesterone, talk with your doctor first. I recommend transmucosal delivery using pharmaceutical-grade bioidentical progesterone mixed with natural vitamin E, not a transdermal cream.

In addition to **lowering your estrogen burden** and LA intake, aspirin is an inexpensive and readily available option. As reported in a 2019 paper in The American Journal of Medicine, the evidence suggests that properly dosed aspirin taken at the onset of symptoms is an effective and safe option for acute migraine, and daily low-dose aspirin may help prevent attacks, although the evidence for prevention is mixed.[11]

Because aspirin can cause stomach-bleeding and isn't suitable for everyone, including children and teens, talk with your doctor before using it.

How to Use Progesterone

Before the detail that follows: Transmucosal progesterone therapy requires a prescription and a clinician's supervision. What is described below is how it is used under that supervision. It is not a protocol to begin on your own, and progesterone is not a supplement you should self-dose — it is a hormone, and the right dose, the right timing, and whether it is appropriate at all depend on your own circumstances. If you are pregnant, trying to conceive, on hormonal contraception or being treated for a hormone-sensitive condition, this needs a doctor before anything else.

It's also important to understand that progesterone is not a magic bullet, and that you get the most benefit by implementing a Bioenergetic diet approach that allows you to effectively burn glucose as your primary fuel without backing up electrons in your

mitochondria that reduces your energy production. My book, “Your Guide to Cellular Health: Unlocking the Science of Longevity and Joy,” covers this process in great detail.

Once you have dialed in your diet, an effective strategy that can help counteract estrogen excess is to take transmucosal progesterone (i.e., applied to your gums, not oral or transdermal), which is a natural estrogen antagonist. Progesterone is one of only three hormones I believe many adults can benefit from. (The other two are DHEA and pregnenolone.)

I do not recommend transdermal progesterone, as your skin expresses high levels of 5-alpha reductase enzyme, which causes a significant portion of the progesterone you're taking to be irreversibly converted primarily into allopregnanolone and cannot be converted back into progesterone.

Ideal Way to Administer Progesterone

Please note that when progesterone is used transmucosally on your gums as I advise, the FDA believes that somehow converts it into a drug and prohibits any company from advising that on its label. This is why companies promote their progesterone products as “topical.”

However, please understand that it is perfectly legal for any physician to recommend an off-label indication for a drug to their patient. In this case, progesterone is a bioidentical hormone rather than a synthetic progestin, and the two have different safety profiles — the risks associated with progestins in the hormone therapy literature do not transfer straightforwardly to bioidentical progesterone. That is not the same as being risk-free at any dose, however. Progesterone is sedating, can affect mood, and interacts with other medications, so the dose must be established in collaboration with the prescribing clinician.

Dr. Ray Peat has done the seminal work in progesterone and probably was the world's greatest expert on progesterone. He wrote his Ph.D. on estrogen in 1982 and spent most of his professional career documenting the need to counteract the dangers of excess

estrogen with low-LA diets and transmucosal progesterone supplementation.

He determined that most solvents do not dissolve progesterone well and discovered that vitamin E is the best solvent to optimally provide progesterone in your tissue. You just need to be very careful about which vitamin E you use, as many supplemental vitamin E products are synthetic and do not provide the form your body uses.

It is imperative to avoid using any synthetic vitamin E (alpha tocopherol acetate — the acetate indicates that it's synthetic). Natural vitamin E will be labeled “d alpha tocopherol.” This is the pure D isomer, which is what your body can use.

There are also other vitamin E isomers, and you want the complete spectrum of tocopherols and tocotrienols, specifically the beta, gamma, and delta types, in the effective D isomer. Look for a label showing the full spectrum of tocopherols and tocotrienols in the D isomer form.

When it comes to application, my preferred approach is to dissolve either powdered or liquid progesterone in natural vitamin E — having established the dosing with your prescriber — and apply it directly to the gums. This transmucosal application allows for optimal absorption and use by the body. There are also premade vitamin E-based progesterone products on the market. Just make sure they’re using natural vitamin E. The recommended time for application is 30 minutes before bed, as progesterone has an anti-cortisol effect and can increase GABA levels, promoting better sleep.

If you are a menstruating woman, you should take the progesterone during the luteal phase or the last half of your cycle, which can be determined by starting 10 days after the first day of your period and stopping the progesterone when your period starts. If you are a male or non-menstruating woman, you can take the progesterone every day for four to six months and then cycle off for one week. This is what I have been personally doing for over a year with very good results. I am a physician so do not have any problems doing this. If you aren't a physician, you should consult one before using this therapy, as transmucosal progesterone therapy requires a doctor's prescription.

FAQs About Migraines in Women

Q: Why are migraines more common in women than in men?

A: Migraines affect women three to four times more often than men in part because of hormonal differences, particularly fluctuations in estrogen and progesterone. Estrogen may increase brain sensitivity to pain, while drops in estrogen can also trigger migraine attacks. Women's reproductive years — when hormone levels shift the most — are also when migraines are most frequent and intense.

Q: How do hormones trigger migraine attacks?

A: High estrogen levels may "prime" your brain for pain by increasing the sensitivity of the trigeminal nerve, which regulates facial sensation and headache pain. The sudden drop in estrogen that follows — such as before menstruation or after childbirth — can act as the final trigger, setting off electrical instability and inflammation that lead to migraine symptoms. Natural progesterone may help counter these effects by calming nerve excitability and balancing estrogen activity.

Q: What role does mitochondrial health play in migraines?

A: Mitochondria are the energy producers in your cells, and when they're underperforming, your brain struggles to maintain stable energy. This energy deficit can make you more prone to migraine attacks. Reducing LA from processed seed oils and supporting mitochondrial nutrients like magnesium, CoQ10, and B vitamins may help stabilize cellular energy and reduce migraine frequency.

Q: Are there natural ways to help lessen the risk of migraine attacks?

A: Yes. Focus on stabilizing hormones and supporting cellular health:

- Keep your LA intake between 2 and 5 grams a day.
- Get morning sunlight and avoid blue light at night to support melatonin production.
- Eat nutrient-dense foods rich in magnesium and B vitamins, and consider supplementation if necessary.
- Track your hormonal cycle and migraine triggers.
- Practice stress management, regular sleep, and relaxation therapies like acupuncture or chiropractic care.

Q: What treatments or supplements are most effective for migraine relief?

A: Natural options that have been studied include magnesium, CoQ10, vitamin D, melatonin, and natural progesterone support. In observational studies, melatonin supplements cut headache frequency by about half on average, although controlled trials were mixed. For acute relief, high-dose aspirin taken early in an attack has been found to be effective and safe, and daily low-dose aspirin may help prevent attacks. Talk with your doctor before using aspirin.

This article is for informational purposes only and does not constitute medical advice. Consult a qualified healthcare provider before making changes to your health regimen.

Sources and References

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