

# Low estrogen levels paired with higher CGRP levels may jump-start migraine

February 22 2023

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As estrogen levels fluctuate, a new study has found that for female participants with migraine, their levels of the protein calcitonin gene-related peptide (CGRP) that plays a key role in starting the migraine

process also fluctuate. The study is published in the February 22, 2023, online issue of *Neurology*.

"This elevated level of CGRP following hormonal fluctuations could help to explain why migraine attacks are more likely during menstruation and why [migraine attacks](#) gradually decline after menopause," said study author Bianca Raffaelli, MD, of Charité-Universitätsmedizin Berlin in Germany. "These results need to be confirmed with larger studies, but we're hopeful that they will help us better understand the migraine process."

The study involved three groups of female participants with episodic migraine. All had at least three days with migraine in the month before the study. The groups were those with a regular menstrual cycle, those taking [oral contraceptives](#), and those who had gone through menopause. Each group was compared to a group of female participants of similar ages who did not have migraine. Each group had 30 people, for a total of 180.

Researchers collected blood and tear fluid to determine CGRP levels. In those with regular menstrual cycles, the samples were taken during menstruation when estrogen levels are low, and around the time of ovulation, when levels are the highest. In those taking oral contraceptives, samples were taken during the hormone-free time and the hormone-intake time. Samples were taken once from postmenopausal participants at a random time.

The study found that female participants with migraine and a regular menstrual cycle had higher CGRP concentrations during menstruation than those without migraine. Those with migraine had [blood levels](#) of 5.95 picograms per milliliter (pg/ml) compared to 4.61 pg/ml for those without migraine. For tear fluid, those with migraine had 1.20 nanograms per milliliter (ng/ml) compared to 0.4 ng/ml for those

without migraine.

In contrast, [female participants](#) taking oral contraceptives and in postmenopause had similar CGRP levels in the migraine and non-migraine groups.

"The study also suggests that measuring CGRP levels through tear fluid is feasible and warrants further investigation, as [accurate measurement](#) in the blood is challenging due to its very short half-life," Raffaelli said. "This method is still exploratory, but it is non-invasive."

Raffaelli noted that while [hormone levels](#) were taken around the time of ovulation, they may not have been taken exactly on the day of ovulation, so the fluctuations in [estrogen levels](#) may not be fully reflected.

**More information:** Bianca Raffaelli et al, Sex Hormones and Calcitonin Gene–Related Peptide in Women With Migraine: A Cross-sectional, Matched Cohort Study, *Neurology* (2023). [DOI: 10.1212/WNL.0000000000207114](#)

Provided by American Academy of Neurology

Citation: Low estrogen levels paired with higher CGRP levels may jump-start migraine (2023, February 22) retrieved 14 May 2024 from <https://medicalxpress.com/news/2023-02-estrogen-paired-higher-cgrp-jump-start.html>

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