

# Blood levels of fat cell hormone may predict severity of migraines

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In a small, preliminary study of regular migraine sufferers, scientists have found that measuring a fat-derived protein called adiponectin (ADP) before and after migraine treatment can accurately reveal which headache victims felt pain relief.

A report on the study of people experiencing two to 12 [migraine](#) headaches per month, led by researchers at Johns Hopkins, is published in the March issue of the journal *Headache*.

"This study takes the first steps in identifying a potential biomarker for migraine that predicts [treatment response](#) and, we hope, can one day be used as a target for developing new and better migraine therapies," says study leader B. Lee Peterlin, D.O., an associate professor of neurology and director of headache research at the Johns Hopkins University School of Medicine. She cautioned that larger, confirmatory studies are needed for that to happen.

Experts estimate that roughly 36 million Americans, or 12 percent of the population, suffer from debilitating [migraine headaches](#) that last four hours or longer. Migraines are defined as headaches with at least two of four special characteristics: unilateral or one-side-of-the-head occurrence; moderately to severely painful; aggravated by routine activity and of a pounding or throbbing nature. Sufferers generally also feel nauseated or are sensitive to light and sound. Women are three times as likely to get migraines as men.

Such complicated [diagnostic criteria](#) mean that diagnosis is tricky, a fact driving efforts, Peterlin says, to find better diagnostic tools.

For the study, Peterlin and her colleagues collected blood from 20 women who visited three headache clinics between December 2009 and January 2012 during an acute [migraine attack](#). Blood was taken before treatment with either

sumatriptan/[naproxen](#) sodium (a drug routinely given to people with migraines) or a placebo. The investigators re-drew blood at 30, 60 and 120 minutes after the study drug was given. Eleven women received the drug and nine got the placebo.

The researchers measured blood levels of ADP, a protein hormone secreted from fat tissue and known to modulate several of the pain pathways implicated in migraine. The hormone is also implicated in sugar metabolism, insulin regulation, immunity and inflammation, as well as obesity, which is a risk factor for migraines.

Peterlin and her colleagues looked at total adiponectin levels and two subtypes or fragments of total ADP in circulation in the blood: low molecular weight (LMW)-adiponectin and high molecular weight (HMW)-adiponectin. LMW is comprised of small fragments of ADP and it is known to have anti-inflammatory properties, while HMW is made up of larger fragments of ADP and is known to have pro-inflammatory properties. Inflammatory pathways in blood vessels in the head are at work in migraine headache.

The researchers found that in all 20 participants when levels of LMW increased, the severity of pain decreased. When the ratio of HMW to LMW molecules increased, the pain severity increased.

"The blood tests could predict response to treatment," Peterlin says.

At onset of pain—even before study drug was given – the researchers could identify who would be a responder to treatment and who would not, as there was a greater ratio of HMW to LMW in those who would be responders as compared to those who were not.

After study treatment changes in adiponectin were also seen. Interestingly, in those patients who reported less pain after receiving study drug to treat

the migraine—whether they got the active migraine medication or a placebo —researchers were able to see a decrease in total levels of ADP in the blood.

Peterlin says the findings indicate it may be possible to develop a treatment that would reduce levels of ADP or parts of adiponectin such as HMW or LMW adiponectin. She says should ADP prove to be a [biomarker](#) for migraine, it could help physicians identify who has migraine and know who is likely to respond to which type of medication. It also may help doctors make better medication choices and try alternate drugs sooner.

Provided by Johns Hopkins University School of Medicine

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