

Study finds potential causality between blood clot factors and migraine with aura

18 May 2021



Credit: Sasha Wolff/Wikipedia

Nearly 15 percent of the U.S. population experiences migraine. One subtype of migraine that is not well understood is migraine with aura (MA). Individuals who experience MA often see flashing lights, blind spots, or jagged lines in their visual field prior to onset of their migraine headaches. Individuals who experience MA also face a heightened risk of stroke and cardiovascular disease, although scientists continue to explore why this correlation exists. In a new study from Brigham and Women's Hospital, researchers used a technique in genetic analysis termed Mendelian randomization to examine 12 coagulation measures, uncovering four that are associated with migraine susceptibility. Interestingly, scientists only observed these associations in individuals who experience MA and did not observe such associations among individuals who experience migraine without aura (MO). Their research suggests that these hemostatic factors could

potentially have a causal role in MA. Their results are published in *Neurology*.

"We've always wanted to know why people with MA have this higher risk of stroke and other cardiovascular diseases," said corresponding author Daniel Chasman, Ph.D., of the Division of Preventive Medicine at the Brigham. "This study offers promising leads specific to MA. Finding a possible cause for migraine with aura has been an outstanding question in the field for a long time."

There has been speculation in the field about relationships between coagulation and migraine susceptibility for some time, but previous research has been largely inconclusive. Most individuals first experience migraine at a young age for example, during childhood or young adulthood. Because previous study designs included only middle-aged and [older adults](#), investigators have questioned whether coagulation causes migraine or if causality exists between these two elements at all. In this study, leveraging Mendelian randomization, which can support or refute potential causal effects on a health outcome, scientists for the first time found evidence that hemostatic factors may contribute to risk of MA.

"Even if we see an association between migraine and these coagulation factors when we measure both factors in a population at the same time, we still wonder: Which one came first?" said co-author Pamela Rist, ScD, of the Division of Preventive Medicine at the Brigham. "One of the interesting parts of Mendelian randomization is that it allows you to examine potential causality."

Researchers used summary statistics from decades of previously collected data from individuals who experience migraine and individuals who do not experience migraine. Because the [diagnostic criteria](#) are different for MA versus MO, they could examine these two conditions separately.

Investigators found a strong association between four coagulation factors and migraine susceptibility. They observed that genetically increased levels of three blood clotting factors: coagulation factor VIII, von Willebrand factor, and phosphorylated fibrinopeptide A, and genetically decreased levels of fibrinogen (a protein important in the late stages of the blood clotting process) were all associated, in part, with migraine susceptibility. Interestingly, scientists did not find this association among individuals who experience [migraine](#) without aura (MO), indicating a specific relationship between these hemostatic factors and MA.

Scientists note that Mendelian randomization has its limitations. In the future, researchers could examine if the causal associations implied by genetics can be observed in clinical practice.

"It is very exciting that by using Mendelian randomization we were able to show that hemostatic factors are associated with MA," said first author Yanjun Guo, MD, Ph.D. of the Division of Preventative Medicine at the Brigham. "And because in the [observational studies](#) we saw that MA patients have a higher risk of stroke, these findings may reveal a potential connection between MA and stroke."

More information: Yanjun Guo et al, Association Between Hemostatic Profile and Migraine, *Neurology* (2021). [DOI: 10.1212/WNL.00000000000011931](#)

Provided by Brigham and Women's Hospital

APA citation: Study finds potential causality between blood clot factors and migraine with aura (2021, May 18) retrieved 28 May 2021 from <https://medicalxpress.com/news/2021-05-potential-causality-blood-clot-factors.html>

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