

Old migraine theory crumpling

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The cause of migraine headaches seems to be in the neural system of the brain, not in dilated blood vessels.

Migraines are common, affecting about 14 percent of the population. But migraines are also a debilitating, mysterious malady - doctors have never been able to figure out why migraine attacks occur.

But now, two Norwegian scientists believe they have found links between 12 genes and the development of migraines. The researchers conducted their work as part of a larger group of medical scientists from eight countries who are undertaking the largest ever genetic study of migraine.

“These discoveries are important because compared to cardiovascular diseases, for example, the severity of migraines is subjectively felt, and patients are fit between attacks,” says Bendik Winsvold, a doctoral research fellow at the Oslo University Hospital.

“So to date it has been hard to uncover the biological mechanism at work.”

Blood vessels

Winsvold thinks the new findings represent a breakthrough in our understanding of the mechanisms at work in migraines.

“Many people, including general practitioners, have believed that migraines can be explained by the dilation and contraction of blood vessels to the brain,” he says.

“This was one theory, but newer research, and our study, indicate this is wrong.”

A study from this April, published in [The Lancet Neurology](#) [8], deconstructs the blood vessel theory.

Danish and other researchers showed in this article that migraines can be caused when nerves around the arteries become temporarily more sensitive ? rather than the dilation of blood vessels surrounding the skull.

Medications ahead?

In the new study, Winsvold and his colleagues studied the genetic material in cells and found 12 major genetic suspects, which in turn are clearly represented in the brain.

“This means we can say the cause of migraines is in the neural system of the brain,” he says.

“By understanding what is happening we will eventually be able to develop targeted medications.”

No current clinical consequences

Professor Jon-Anker Zwart is the second Norwegian researcher involved in the findings. Winsvold is a research fellow in Zwart's research group, and both are connected to the Oslo University Hospital.

The new study is basic research, so the findings will not have short-term consequences for migraine treatment.

“The results are generally a matter of understanding migraines better. The next step will be to investigate each of the 12 genes.”

“These produce a protein which is apparently essential. So we can conceive of prospective medicines that either increase or decrease the activity of this protein,” says Winsvold.

Winsvold is a first co-author with Finland's Verner Anttila of the new analyses, which have recently been published in the journal *Nature Genetics*.

Miles to go

Although scientists are encouraged by the new discoveries, they caution that it will take years before we fully understand migraines.

“Full comprehension of migraines is still in the distant future. It will certainly take many years before we can develop possible cures.”

“The possibility of better treatment is a little closer. And with the new discoveries we're making inroads for further research,” says Winsvold.

Migraines were rated as the seventh largest cause of disability in the world by Global Burden of Disease Survey 2010.

Genetic component

The medical researchers analysed samples from 29 genome studies of more than 100,000 people with and without migraines.

“This approach is really large scale. With a study of upwards of 100,000 samples of people with and without migraines, we were able to find the main suspect genes and pursue these in the lab,” says one of the authors, Gisela Terwindt of Leiden University Medical Centre in a press release.

The researchers already knew there is a strong genetic component involved in the development of migraines.

The risk distribution is split 50-50 between genetic and environmental factors, so it comes as no surprise that genes play such an essential role.

Reference

Verner Anttila, Bendik Winsvold, et al. Genome-wide meta-analysis identifies new susceptibility loci for migraine. *Nature Genetics*, Letters, 23. juni 2013. doi: 10.1038/ng.2676

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June 26, 2013 - 06:43

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