

The brain of migraine sufferers is hyper-excitabile, new study suggests

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Credit: Sasha Wolff/Wikipedia

Individuals who suffer from migraine headaches appear to have a hyper-excitabile visual cortex researchers at the Universities of Birmingham

and Lancaster suggest.

Migraines are characterised as debilitating and persistent headaches, often accompanied by an increased sensitivity to visual or other sensory stimuli. The exact causes of these headaches are not well understood, although scientists believe they may be related to temporary changes in the chemicals, nerves, or blood vessels in the brain.

In a new study, published in the journal *Neuroimage: Clinical*, researchers set out to test a theory that at least part of the answer lies in the visual [cortex](#)—the part of our brain that is responsible for vision.

Dr. Terence Chun Yuen Fong, lead author on the study, explained: "Most migraineurs also report experiencing abnormal visual sensations in their [everyday life](#), for example, elementary hallucinations, visual discomforts and extra light sensitivity. We believe this hints at a link between migraine experiences and abnormalities in the visual cortex. Our results provide the first evidence for this theory, by discovering a specific brain response pattern among migraineurs."

The study was carried out by researchers based in the Centre for Human Brain Health and School of Psychology at the University of Birmingham, and the Department of Psychology, Lancaster University. The team set up an experiment with a group of 60 volunteers, half of whom were 'migraineurs'—regularly suffering from migraines. Participants were presented with a striped grating pattern, and asked to rate the pattern according to whether it was uncomfortable to look at, or any associated visual phenomena from viewing it.

In a further test, the participants underwent an electroencephalogram (EEG) test, in which the researchers were able to track and record [brain](#) wave patterns when the visual stimuli were presented.

In both tests, the researchers found a larger response in the visual cortex among the group of migraine sufferers when participants were presented with the gratings.

The study also took into account results from a subgroup of non-migraineurs—participants who reported additional visual disturbances, a common feature of migraines. Surprisingly, it was found that these participants also showed hyperexcitability in the response of their visual cortex.

Dr. Ali Mazaheri, the senior author on the paper, explains: "Our study provides evidence that there are likely specific anomalies present in the way the [visual cortex](#) of migraine sufferers processes information from the outside world. However, we suspect that is only part of the picture, since the same patterns of activity can also be seen in non-migraineurs who are sensitive to certain visual stimuli."

The next step in this research will be to monitor the group over time to see if their response to the [visual stimuli](#) changes as they get close to having a [migraine](#) and to try to map what other physiological changes might be occurring. This will pave the way to being able to forecast [migraine headaches](#) and help prevent their onset.

More information: Chun Yuen Fong et al, Differences in early and late pattern-onset visual-evoked potentials between self-reported migraineurs and controls, *NeuroImage: Clinical* (2019). [DOI: 10.1016/j.nicl.2019.102122](https://doi.org/10.1016/j.nicl.2019.102122)

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