

Whiplash symptoms are caused by actual changes in the brain, research suggests

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Whiplash symptoms that last years after a car accident but cannot be seen in tests could be down to previously unseen functional changes in the pain and posture processing parts of the brain, according to research published in *EBioMedicine*. The results of the study suggest close interaction between the neck and brain, resulting in changes in blood flow.

The authors of the study, from the University of Groningen in the Netherlands and Offenburg University in Germany, say their findings may bring closer the possibility of diagnosing chronic whiplash associated disorder (cWAD), potentially helping relieve people's [pain](#).

An estimated 3 in 1000 people suffer from whiplash, and one in four of them have chronic symptoms. Whiplash is associated with having an accident in a car, causing the driver's neck to move forward and backwards like a whip. Usually these accidents occur at low speed; most people don't see a doctor as they don't think anything is wrong. But soon after the accident, they may start noticing pain in their head, neck and jaw. This family of symptoms is called whiplash-associated disorder, and it is notoriously difficult to diagnose.

"Patients often report these symptoms for years, but if they do see a doctor nothing shows up on the tests," explained Dr. David Vázquez García, lead author of the study. "Many people start thinking they may be making the symptoms up or trying to make a claim for compensation. It's a tricky situation in which the patient is in pain, the doctors can't

explain it and people think they're making it up. We wanted to uncover a real cause of the symptoms – one that could help doctors diagnose and treat it."

Previous research has shown that people with cWAD can be more sensitive to pain, through an effect called central hyperexcitability. Studies have also shown changes in the blood flow in the brain, but none had looked at the two together, to determine whether the connection between the neck and deeper parts of the brain was causing whiplash symptoms.

The researchers scanned the brains of 20 women – 8 healthy, pain-free women and 12 with cWAD – using a technique called [positron emission tomography](#) (PET). They exposed each group to four different levels of non-painful electrical neck stimulation and scanned them.

The results showed changes in the [blood flow](#) in areas of the brain involved in pain perception and processing sensory information from within the body (interoceptive stimuli). These changes, say the researchers, could be down to a mismatch in the way interoceptive stimuli are integrated in pain processing regions.

"With the recent accumulated scientific evidence, we can now say there is something happening in the brain," said Dr. Vázquez García. "I think our study will improve awareness about the disease, of the public and of medical doctors, and help [people](#) with chronic whiplash-associated disorders get the decent treatment they need."

The research goes a long way to explaining why sufferers of cWAD can experience chronic [symptoms](#), but more research is needed to understand in detail the role of the brain in this process. Dr. Vázquez García and the team are now considering what to look at next, such as inflammation in the [brain](#) or changes in the structure of other functional

regions.

More information: David Vallez Garca et al. Altered Regional Cerebral Blood Flow in Chronic Whiplash Associated Disorders, *EBioMedicine* (2016). [DOI: 10.1016/j.ebiom.2016.07.008](https://doi.org/10.1016/j.ebiom.2016.07.008)

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