

Study reveals how people with a severe unexplained psychological illness have abnormal activity in the brain

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Psychogenic diseases, formerly known as 'hysterical' illnesses, can have many severe symptoms such as painful cramps or paralysis but without any physical explanation. However, new research from the University of Cambridge and UCL (University College London) suggests that individuals with psychogenic disease, that is to say physical illness that stems from emotional or mental stresses, do have brains that function differently. The research was published today, 25 February, in the journal *Brain*.

Psychogenic diseases may look very similar to illnesses caused by damage to nerves, the brain or the muscles, or similar to <u>genetic diseases</u> of the nervous system. However, unlike organic diseases, psychogenic diseases do not have any apparent physical cause, making them difficult to diagnose and even more difficult to treat.

"The processes leading to these disorders are poorly understood, complex and highly variable. As a result, treatments are also complex, often lengthy and in many cases there is poor recovery. In order to improve treatment of these disorders, it is important to first understand the underlying mechanism," said Dr James Rowe from the University of Cambridge.

The study looked at people with either psychogenic or organic <u>dystonia</u>, as well as healthy people with no dystonia. Both types of dystonia caused



painful and disabling muscle contractions affecting the leg. The organic patient group had a <u>gene mutation</u> (the DYT1 gene) that caused their dystonia. The psychogenic patients had the symptoms of dystonia but did not have any physical explanation for the disease, even after extensive investigations.

The scientists performed PET brain scans on the volunteers at UCL, to measure the blood flow and <u>brain activity</u> of both of the groups, and healthy volunteers. The participants were scanned with three different foot positions: resting, moving their foot, and holding their leg in a dystonic position. The <u>electrical activity</u> of the <u>leg muscles</u> was measured at the same time to determine which muscles were engaged during the scans.

The researchers found that the brain function of individuals with the psychogenic illness was not normal. The changes were, however, very different from the brains of individuals with the organic (genetic) disease.

Dr Anette Schrag, from UCL, said: "Finding abnormalities of brain function that are very different from those in the organic form of dystonia opens up a way for researchers to learn how psychological factors can, by changing brain function, lead to physical problems."

Dr Rowe added: "What struck me was just how very different the abnormal <u>brain function</u> was in patients with the genetic and the psychogenic dystonia. Even more striking was that the differences were there all the time, whether the patients were resting or trying to move."

Additionally, the researchers found that one part of the brain previously thought to indicate psychogenic disease is unreliable: abnormal activity of the prefrontal cortex was thought to be the hallmark of psychogenic diseases. In this study, the scientists showed that this abnormality is not



unique to psychogenic disease, since activity was also present in the patients with the genetic cause of dystonia when they tried to move their foot.

Dr Arpan Mehta, from the University of Cambridge, said: "It is interesting that, despite the differences, both types of patient had one thing in common - a problem at the front of the brain. This area controls attention to our movements and although the abnormality is not unique to psychogenic dystonia, it is part of the problem."

This type of illness is very common. Dr Schrag said: "One in six patients that see a neurologist has a psychogenic illness. They are as ill as someone with organic disease, but with a different cause and different treatment needs. Understanding these disorders, diagnosing them early and finding the right treatment are all clearly very important. We are hopeful that these results might help doctors and patients understand the mechanism leading to this disorder, and guide better treatments."

More information: The paper 'The functional neuroimaging correlates of psychogenic versus organic dystonia' will be published in the 25 February edition of *Brain*.

Provided by University of Cambridge

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