Medical Xpress

Obsessive compulsive disorder linked to brain activity

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Cambridge researchers have discovered that measuring activity in a region of the brain could help to identify people at risk of developing obsessive compulsive disorder (OCD).

As the current diagnosis of OCD is based on a clinical interview and often does not occur until the disorder has progressed, this could enable earlier more objective detection, and intervention.

The scientists, funded by the Medical Research Council and Wellcome Trust, have discovered that people with OCD and their close family members show under-activation of brain areas responsible for stopping habitual behaviour. This is the first time that scientists have associated functional changes in the brain with familial risk for the disorder. Their findings are reported in the 18 July edition of *Science*.

Obsessive compulsive disorder is a debilitating condition that affects 2-3% of the population at some point in life. Patients suffer from recurrent intrusive thoughts (obsessions) that are distressing and hard to suppress. Examples include fears of contamination, or that something terrible will happen to a loved one. They also suffer from repetitive rituals (compulsions), which are often designed to neutralise these thoughts. Examples include hand-washing and checking gas hobs. These symptoms cause distress and can occupy hours during the day, interfering with quality of life and the ability to work.

Although OCD tends to run in families, genetic factors responsible for

this heritability are not known. Genes may pose a risk for OCD by influencing how the brain develops.

Dr Samuel Chamberlain at the University of Cambridge's Department of Psychiatry used functional magnetic resonance imaging (fMRI) to measure brain activity in the lateral orbitofrontal cortex (OFC). Located in the frontal lobes the lateral OFC is involved in decision making and behaviour.

Volunteers were asked to look at two pictures on a screen, each image had a house and a face superimposed. The volunteers were asked to use trial and error to work out whether the house or face was the correct target. Volunteers pressed a button to indicate which image they believed to be the target and feedback of 'correct' or 'incorrect' was given on the screen. After the correct target had been identified six times in a row it changed so the volunteer had to learn again. fMRI was used to monitor their patterns of brain activity throughout.

Fourteen volunteers without a family history of OCD, 14 people with OCD and 12 immediate relatives of these patients took the picture test. Later comparison of fMRI images of their brain activity throughout showed under-activation in the lateral orbitofrontal cortex and other brain areas in both the OCD patients and their family members.

Dr Chamberlain, who led the study, explains, "Impaired function in brain areas controlling flexible behaviour probably predisposes people to developing the compulsive rigid symptoms that are characteristic of OCD. This study shows that these brain changes run in families and represent a candidate vulnerability factor. The current diagnosis of OCD is subjective and improved understanding of the underlying causes of OCD could lead to more accurate diagnosis and improved clinical treatments.

"However, much work is still needed to identify the genes contributing to abnormal brain function in those at risk of OCD. We also need to investigate not only vulnerability factors, but also protective factors that account for why many people at genetic risk of the condition never go on to develop the symptoms."

Source: University of Cambridge