Shrinking brain could aid diagnosis of clinical depression

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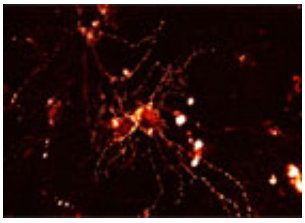

Hippocampal neurons. Credit: AJ Irving, Wellcome Images.

(Medical Xpress) -- Parts of the brain appear to shrink when people suffer from severe depression, according to research funded by the Wellcome Trust and the National Institute for Health Research.

In a study carried out at the Biomedical Research Centre for Mental Health at the Maudsley Hospital, London, scientists found that people with clinical depression have reduced brain volume in several regions, including the frontal lobe (responsible for planning, judgement and emotions), basal ganglia (movement) and hippocampus (memory).

The study, published in 'Archives of General Psychiatry', also suggests that the hippocampus returns to normal size when someone recovers or is in remission - suggesting that at least some of the changes are only temporary.

The changes to brain structure are distinct from those in the brains of

people with bipolar disorder, to which they were compared, and might enable clinicians to identify and diagnose clinical depression using magnetic resonance imaging (MRI). This will enable them to confirm that the symptoms are not the result of another psychiatric or neurological illness - something that is currently clinically difficult.

Dr Matthew Kempton, first author on the study, said: "Until now, we had no biological markers to distinguish between major depression and similar conditions such as bipolar disorder. Telling the difference between conditions is obviously very important as the diagnosis determines the treatment. In the case of clinical depression and bipolar disorder, one is treated with antidepressants and the other is mainly treated with mood stabilisers such as lithium."

Researchers performed a meta-analysis combining results from 143 previous studies, each using MRI to measure brain structure in people with depression. They compared the results to 98 studies of people with bipolar disorder.

People with clinical depression were found to have greater reductions in grey matter volume than those with bipolar disorder, whereas in bipolar disorder, more abnormalities were identified in white matter - the connections in the brain. Discovering when and how these changes in the brain occur will help researchers to understand more about the causes of depression and ultimately how to treat it more effectively.

The study also found that the adrenal glands increased in volume in people with depression. The adrenal glands sit on top of the kidneys and produce cortisol, a hormone that is released in response to stress. Other research suggests that if this hormone is produced over a long time period, it might shrink certain areas of the brain such as the hippocampus.

More information: Kempton MJ et al. Structural neuroimaging studies in major depressive disorder. Arch Gen Psych 2011 [epub ahead of print]

Provided by Wellcome Trust