

## Brain scans could help plan best treatment

Brain scans may be able to help predict how severe an illness involving the symptoms of psychosis will be in future. Researchers have worked out a procedure for recognising patterns in MRI images of the brain taken after a first episode of psychosis which can forecast whether an individual will remain seriously unwell or go into long periods of remission.

This means MRI scans could potentially be used to enable doctors to plan the most appropriate treatment very early on, said Dr Paola Dazzan from the Institute of Psychiatry (IoP), King's College London, who jointly led the research with Dr Janaina Mourao-Mirand from University College London.

The research suggests that by the time people experience a first episode of psychosis, changes have already occurred in the structure of their brain that can be seen by MRI scan and analysed by computer to help predict how severe the illness will become.

The new computer analysis procedure (or algorithm) was developed using MRI brain scans of 100 people who had experienced psychosis for the first time and 91 people who had never been unwell. The people who had experienced psychosis were followed up about six years later so researchers could find out how serious their illness had become. This information, together with the original scans, allowed contrasts and comparisons to be made and the new technique to be developed.

It's still early days, but the pilot study showed that, when applied to the original scans, the technique was able to determine in seven out of 10 cases which people had gone on to be very unwell (continuous psychosis) and which people had experienced episodic psychosis (with shorter periods of being unwell and long periods of remission).

The results of the research were published in the academic journal *Psychological Medicine* in November 2011.

'This is the first step towards being able to use brain imaging to provide tangible benefit to patients affected by psychosis,' said Dr Dazzan. 'This could in future offer a fast and reliable way of predicting the outcome for an individual patient, allowing us to optimise treatments for those most in need while avoiding long term exposure to antipsychotic medications for people with very mild forms of psychosis.'

'Structural MRI scans can be obtained in as little as 10 minutes and so this technique could be incorporated into routine clinical investigations. The information this provides could help inform the treatment options available to each patient and help us better manage their illness.'

At the moment, mental health professionals have no way of correctly assessing how likely an individual is to experience future episodes of psychosis when they first become unwell.

story continues on next page

## Brain scans could help plan best treatment /2

The study was funded by the National Institute for Health Research Biomedical Research Centre for Mental Health at the IoP/South London and Maudsley NHS Foundation Trust; by the Medical Research Council; the National Alliance for Research on Schizophrenia and Depression (NARSAD) and the Wellcome Trust.

Using brain scans to determine a prognosis is not the same as using scans to make a diagnosis. The National Institute for Clinical Excellence recommends MRI or CT scanning of people's brains should not be routinely used to help diagnosis after a first episode of psychosis. The guidance – Structural neuroimaging in first episode psychosis (February 2008) – says scanning does not improve diagnosis and is not cost-effective.

- Individualised prediction of illness course at the first psychotic episode: a support vector machine MRI study. Mourao-Miranda J, Reinders AA, Rocha-Rego V, Lappin J, Rondina J, Morgan C, Morgan KD, Fearon P, Jones PB, Doody GA, Murray RM, Kapur S, Dazzan P. *Psychological Medicine*, 2011, November 7: 1-11 (Epub ahead of print).