

## **The psychophysiology of neurological abnormalities in first episode psychosis and in healthy individuals - A study using multimodal brain imagin**

### **Results:**

This study evaluated 54 first psychotic episode patients and 46 healthy controls, using multimodal imaging (structural and functional), to identify the neuroanatomical and functional correlates of neurological performance.

Patients showed more neurological signs than controls. There were no significant differences in grey and white matter volumes between patients and controls, although patients had larger, at trend-level, CSF volumes. Global brain volumes were not correlated with performance at any of the neurological subscales.

Preliminary analysis of white matter tracts in patients showed that a worse performance in Primary signs, reflecting more “hard” neurological abnormalities, was associated with disruption of tracts integrity, and specifically with: increased Fractional Anisotropy (FA) of the Corpus Callosum, both Uncinate fasciculi, right Inferior Fronto-Occipital fasciculus (IFOF); left Inferior Longitudinal fasciculus (ILF). A worse performance on Motor Sequencing was associated with a shorter length of the right IFOF, and a worse performance in Sensory Integration was correlated with a reduction in right Mean Diffusivity of this fasciculus.

An Audio-Visual task was successfully developed to investigate sensory integration during functional MRI. Patients had longer reaction time, and gave more incorrect answers, and had larger frontal lobe activation than healthy controls, particularly so if they had a poorer response to treatment.

In conclusion, morpho-anatomical information alone are not sufficient to define the substrate of neurological dysfunction in psychosis, which is likely to reflect an altered structural, and possibly functional connectivity.

### **Published work:**

#### **Papers:**

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- Demjaha A, Morgan K, Morgan C, Landau S, Dean K, Reichenberg A, Sham P, Fearon P, Hutchinson G, Jones PB, Murray RM, Dazzan P. Combining dimensional and categorical representation of psychosis: the way forward for DSM-V and ICD-11? *Psychological Medicine*, 2009, 39:1943-55.
- Dazzan P, Lloyd T, Morgan KD, Zanelli J, Morgan C, Orr K, Hutchinson G, Fearon P, Allin M, Rifkin L, McGuire PK, Doody GA, Holloway J, Leff J, Harrison G, Jones PB, Murray RM. Neurological abnormalities and cognitive ability in first-episode psychosis. *British Journal of Psychiatry*, 2008, 193:197-202.

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**Area(s) of interest:**

Psychosis, MRI, Schizophrenia, Neurological signs

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