

S18. Symposium: CAN WE IMPROVE THE PREDICTION OF THE ONSET OF PSYCHOSIS (Organised By AEP Section On Neuroimaging)

S18.01

Neural correlates of executive function and working memory in the 'at risk mental state'

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Background and Aims: People with 'prodromal' symptoms have a very high risk of developing psychosis. We used functional MRI to examine the neurocognitive basis of this vulnerability.

Method: Cross-sectional comparison of subjects with an ARMS (n=17), first episode schizophreniform psychosis (n=10) and healthy volunteers (n=15). Subjects were studied using functional MRI while they performed an overt verbal fluency task, a random movement generation paradigm and an N-Back working memory task.

Results: During an N-Back task the ARMS group engaged inferior frontal and posterior parietal cortex less than controls but more than the first episode group. During a motor generation task, the ARMS group showed less activation in the left inferior parietal cortex than controls, but greater activation than the first episode group. During verbal fluency using 'Easy' letters, the ARMS group demonstrated intermediate activation in the left inferior frontal cortex, with first episode groups showing least, and controls most, activation. When processing 'Hard' letters, differential activation was evident in two left inferior frontal regions. In its dorsolateral portion, the ARMS group showed less activation than controls but more than the first episode group, while in the opercular part of the left inferior frontal gyrus / anterior insula activation was greatest in the first episode group, weakest in controls and intermediate in the ARMS group.

Conclusions: The ARMS is associated with abnormalities of regional brain function that are qualitatively similar to those in patients who have just developed psychosis but less severe.

S18.02

White matter changes from the prodrome to first psychotic episode

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Background: There is increasing evidence that changes in connections linking brain regions, as well as grey matter volumetric abnormalities are important in schizophrenia. The extent to which these are related to being at risk of psychosis as opposed to having a psychotic disorder is unclear. We will review the diffusion tensor imaging (DTI) findings which inform us about white matter integrity and organization, and relate it to our own work which compares grey matter volumes and white matter integrity in people at high risk of psychosis, patients with first episode psychosis, and healthy volunteers. We will also discuss the relationship of these findings to clinical symptoms and outcome.

Methods: 30 subjects with an 'at risk mental state' (PACE criteria), 15 first psychotic episode patients and 30 controls were studied using an SPGR sequence and DTI.

Results: Both the volumetric and DTI datasets were analysed using voxel based techniques in standard space. There were frontal and temporal grey matter reductions in the first episode group and more modest temporo-parietal volume reductions in the 'at risk' group. The first episode group had reduced fractional anisotropy in the superior longitudinal fasciculus bilaterally, left anterior corpus callosal and right superior fronto-occipital tracts relative to controls, with qualitatively similar but less severe reductions in the 'at risk' subjects.

Conclusions: Abnormalities in the frontal and temporal grey matter and the tracts connecting them were evident in patients with first episode schizophrenia, with similar but less marked abnormalities in subjects with an 'at risk' mental state.

S18.03

Cognitive capability of individuals at risk with and without transition to psychosis

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Objectives: To compare neuropsychological functions of individuals at risk (IR) for psychosis and patients with a first episode of psychosis (FE) with healthy control subjects (HC). And to determine cognitive factors which have the potential to discriminate IR with (IRtrans) and without (IRnon-trans) transition to psychosis.

Methods: N = 60 prodromal IR and N = 51 healthy control subjects were assessed with a comprehensive neuropsychological test battery. Besides general intelligence the test battery covered two functional domains (executive and attentional functions) and working memory. Within a follow up period of at least 30 month N = 19 IR transitioned to psychosis and N = 30 IR still have been followed up.

For each patient group (FE and IR), cognitive profiles were constructed by means of z-values adjusted for demographic and medication influence. The HC mean performance level was used as baseline of each group profile. A further profile was constructed by differential values considering IRtrans versus IRnon-trans. Comparisons were carried out by MANOVA and post-hoc t-tests.

Results: In all functional domains FE and IR performed below HC except for specific sustained attention measures. There were no significant differences between FE and IR.

Executive functions and working memory measures were more compromised in IRtrans as compared to IRnon-trans.

Conclusions: Neuropsychological deficiencies precede psychotic breakdown. This indicates that neuropsychological assessments of affected domains may support early detection of psychosis.

S18.04

Ventricle volumes in emerging psychosis. A cross-sectional and longitudinal MRI study

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