

## Neuroimaging

### FC42

#### Parkinsonism and basal ganglia volumes in first-episode psychosis

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**Introduction** Parkinsonian motor signs are the most frequent of the genuine motor abnormalities present in drug-naïve patients with schizophrenia, and are also present in patients with a first-episode of psychosis (FEP).

**Objective** To study whether there are differences in basal ganglia volumes depending on the presence of Parkinsonism in FEP.

**Methods** Forty-six patients with a FEP were included in the study. Twenty-three controls were included to normalise patients' brain volume data. Parkinsonism was assessed with the UKU scale. Brain volumes were obtained with MRI (1.5 Tesla Siemens Avanto). Reconstruction and volumetric segmentation was made with the Freesurfer© software (<http://surfer.nmr.mgh.harvard.edu/>). Patients were divided into two groups, considering the presence/absence of Parkinsonism (UKU total score cutoff point=4). Patients have been treated with antipsychotics a mean of less than 2 months. There were not significant differences in the total exposure to antipsychotics between both groups. ANCOVAs were performed including gender as covariate.

**Results** Patients with Parkinsonism showed a trend towards significance to exhibit reduced volumes in the left caudate and right putamen (Fig. 1).

**Conclusions** FEP patients who exhibit Parkinsonian signs tend to show reduced left caudate and right putamen volumes in the early phases of psychotic illness, after correcting by gender.

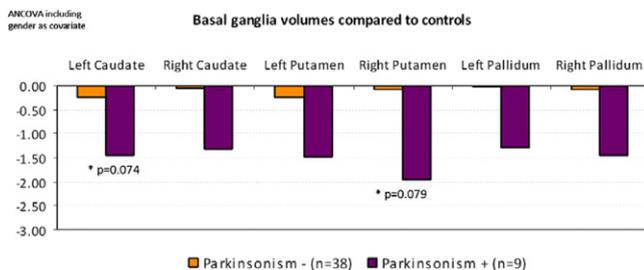


Fig. 1

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### FC43

#### The role of neurometabolites in emotional processing

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**Objective** To investigate how brain metabolites, especially glutamate and glutamate to glutamine ratio of pgACC modulate the neural response within these areas and how this affects their function during emotion facial expression matching task.

**Methods** Seventy healthy volunteers underwent magnetic resonance spectroscopy (MRS) and task functional magnetic resonance imaging (fMRI) in 7 Tesla scanner. PgACC MRS data were obtained using STEAM sequence and analyzed using LCModel.

Angry, fearful, and happy facial expressions were presented in an affect-matching block where one of the two facial expressions presented matched the target facial expression. The control condition was form matching. Data were preprocessed and analyzed in SPM 8.

**Results** Glutamate to Creatine ratio measured in pgACC positively correlated with BOLD response in the right DLPFC during negative emotional perception (FWE=0.05). Glutamate to glutamine ratio indicating on-off mechanisms in pgACC positively correlated with BOLD responses in FFA extending to cerebellum cluster (FWE<0.05).

**Conclusion** This study indicates that pgACC, baseline metabolism predicts neural response to emotional processing. We conclude that individuals with higher glutamate ratios, an excitatory neurotransmitter, in pgACC during rest might have a better coping mechanism to potential danger indicated by perception of angry or afraid faces. The higher glutamate to glutamine ratio in pgACC indicates a higher turnover of excitatory metabolite glutamate. This mechanism is associated with higher emotional response in fusiform area and cerebellum suggesting higher visual attention towards negative emotions.

**Disclosure of interest** The authors have not supplied their declaration of competing interest.

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### FC44

#### Association analysis of imbalanced interhemispheric functional coordination and early therapeutic efficacy in major depressive disorder: Evidence from resting state fMRI

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**Introduction** Emerging evidences indicate that the alteration of interhemispheric functional coordination may be involved in the pathogenesis of major depressive disorder (MDD). In present study, we aim to explore the potential marker by using the voxel-mirrored homotopic connectivity (VMHC) approach, which may be contributing to predict the clinical prognosis in MDD.

**Methods** Eighty-two MDD patients and 50 normal control (NC) subjects participated in this study. We divided the MDD group into unremitted and remitted group according to the reduction rate of Hamilton Rating Scale for Depression (HAM-D) within 2 weeks.

**Results** The study detected significantly decreased VMHC in bilateral precuneus (pCu), inferior temporal gyrus (ITG) and

increased VMHC in middle frontal gyrus (MFG) and caudate nucleus when compared remitted depression (RD) group to unremit- ted depression (URD) group. Meanwhile, when compared with NC group, the URD group presented reduced VMHC in bilateral cerebellum anterior lobe, thalamus and postcentral gyrus. Furthermore, the VMHC in media frontal gyrus, postcentral gyrus and precentral gyrus were significantly decreased in RD group. Correlation analysis suggested that reduced VMHC in bilateral pCu was negatively correlated with the baseline HAMD score of URD ( $r = -0.325, P = 0.041$ ). Receiver operating characteristic (ROC) curve indicated that three regional VMHC changes could identify depressed patient with poorer treatment response: ITG [area under curve (AUC) = 0.699,  $P = 0.002$ , 95% CI = 0.586–0.812], MFG (AUC = 0.692,  $P = 0.003$ , 95% CI = 0.580–0.805), pCu (AUC = 0.714,  $P = 0.001$ , 95% CI = 0.603–0.825).

**Conclusion** The current study combined with previous evidence indicates that the subdued intrinsic interhemispheric functional connectivity might represents a novel neural trait involved in the pathophysiology of MDD.

**Disclosure of interest** The authors have not supplied their declaration of competing interest.

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#### FC45

### Alteration in creatine phosphate behavior in excited visual cortex of early-stage schizophrenia patients measured by phosphorus magnetic resonance spectroscopy

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**Introduction** 31P MRS is a unique way of in vivo energy metabolism research. This method allowed revealing schizophrenia-induced disturbances of energy exchange in resting state [1]. We use 31P MRS in presence of visual stimulation that allows neuronal energy-consuming processes studying.

**Objective** Revealing of stimulation effects on high-energy phosphates (PCr, ATP) in early-stage schizophrenia.

**Aim** Discovery of energy processes contribution in schizophrenia pathogenesis.

**Methods** Twelve right-handed 18–26 years old male patients with early-staged schizophrenia (F20, ICD-10) and 20 age-matched healthy right-handed controls. Spectra were acquired on Philips Achieva 3.0 T using Rapid Biomed 31P/1H birdcage coil and 2D ISIS pulse sequence. fMRI was used for accurate 2D slice positioning, spectroscopy voxels containing primary visual cortex (V1) were averaged (see Fig. 1). Two 31P spectra of V1 were obtained: firstly in resting state and then during 6 minutes of continuous stimulation by 6 Hz flashing checkerboard. Spectra were processed in jMRUI.

**Results** Excitation reduced PCr in the norm and had no effect on schizophrenia (see Fig. 2). No excitation-induced ATP changes in both groups were revealed.

**Conclusion** Alteration in PCr behavior in this study witnesses for deviations in energy-consuming processes in schizophrenia. A new scheme of neuronal response to stimulation in schizophrenia is offered.

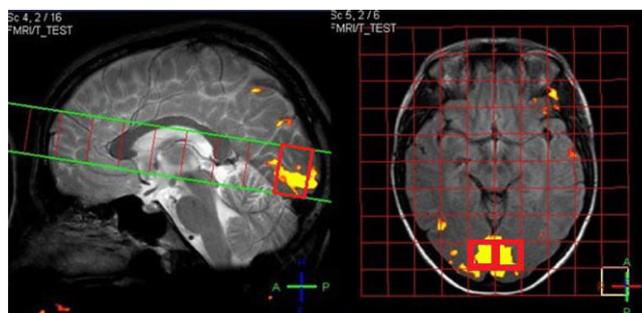


Fig. 1 fMRI-guided voxel positioning in visual cortex.

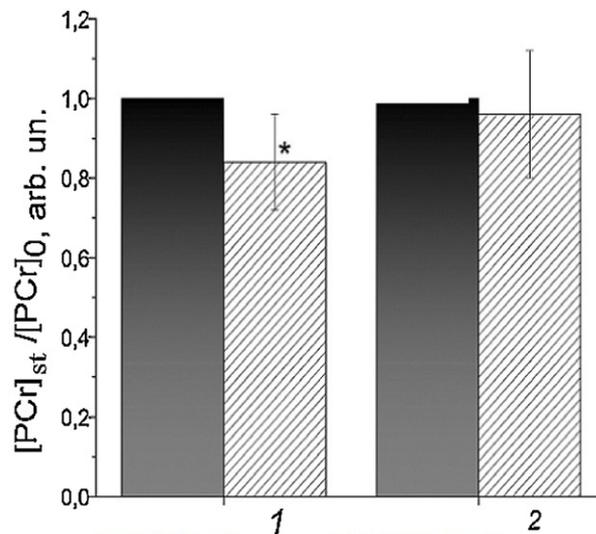


Fig. 2 PCr of visual cortex in the norm (1) and in schizophrenia (2) during continuous stimulation relative to PCr in resting state. \*  $P < 0.05$  by Mann-Whitney U-criteria.

**Disclosure of interest** The authors have not supplied their declaration of competing interest.

**Reference**

[1] Du F. JAMA Psychiatry 2014;71(1):19–27.

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#### FC46

### Trimodal approach (PET/MR/EEG) of response inhibition as a possible biomarker for schizophrenia

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**Introduction** The aim of the FP7-European funded project TRIM-AGE is to create a trimodal, cost-effective imaging tool consisting of PET/MR/EEG to enable effective early diagnosis of schizophrenia.

**Objective** In the scope of this project we are interested in the multimodal assessment of response inhibition. The loudness