neurodevelopmental patterns, it is hypothesized that brain volumetric patterns in individuals with high positive schizotypy are intrinsically different to those observed in persons reporting high negative schizotypy and to individuals with overall low schizotypal traits. The present study aims to evaluate this hypothesis using novel machine learning techniques to address the multivariate nature of psychotic diseases and the brain itself.
Methods: Data from the TYPIA Study, an ongoing project conducted at the Ludwig-Maximilian University of Munich and the University of Bonn in Germany, was used to investigate whether brain volumetric patterns are distinct in healthy individuals with high positive (HPS) and high negative schizotypy (HNS) when compared to one another (HPS vs HNS) and to individuals with self-reported low schizotypy (LS vs HNS and LS vs HPS). A preliminary analysis on grey matter volumetric patterns from 29 LS (19 f., mean age: 24.6 y.), 28 HNS (20 f., mean age: 26.8 y.) and 23 HPS (17 f., mean age: 26.4 years) individuals from the general population without any current psychiatric diagnosis was performed. Group divisions were based on the introvertive anhedonia and unusual experiences subscales from the Oxford-Liverpool Inventory of Feelings and Experiences (O-LIFE). Structural images were preprocessed with a standard voxel based morphometry pipeline using the SPM-based CAT12 toolbox in Matlab. After age, sex and grey matter intracranial volume and center corrections, a linear support vector classification (SVC) algorithm was used to assess separability between the groups.
Results: Our preliminary cross-validated results showed that LS and HNS can be separated with 56.0 % balanced accuracy (BAC), whereas LS vs HPS and HNS vs HPS allowed for only 42.87% and 48.8% BAC respectively. Interestingly, a post-hoc analysis comparing LS vs both high schizotypy groups merged together showed the highest BAC (59.2%). As expected, the brain differences between groups are rather small, since the sample consists fully of healthy controls. However, these results indicate that personality traits related to HNS are linked to more pronounced changes in the brain as compared to HPS. Nevertheless, schizotypy as a combination of the positive and negative dimensions allowed for a higher classification accuracy when compared to LS, supporting the notion of schizotypy as a unitary construct as observed from the post-hoc analysis. Furthermore, HNS and HPS were not separable by the algorithm, most likely due to the intrinsic heterogeneity of the construct.
Discussion: Our results align with previous studies claiming that negative symptoms are associated with structural changes in the CNS whereas positive symptoms relate to changes in functioning and activation of the brain. A larger sample as well as using other data modalities will confirm the stability of our findings. Research on volumetric patterns of the brain areas related to negative symptoms in non-clinical samples might lead to a better understanding of the underlying causes of schizophrenia. Above all, our results show that investigating non-clinical expression of psychosis-like symptoms is a promising strategy to understand the prodromal stadium of schizophrenia.

T19. MULTIMODAL IMAGING IN FIRST EPISODE PSYCHOSIS: MAGNETOENCEPHALOGRAPHY, 7T FMRI STROOP, AND 7T MRS SPECTROSCOPY

Timothy Gawne*[,1], Greg Overbeek[1], Jefferey Killen[1], David White[1], Meredith Reid[2], Noah Salibi[2], Thomas Denny[2], Ellis Charles[3], Adrienne Lahti[1]
[1]University of Alabama at Birmingham; [2]Auburn University; [3]Louisiana Tech

Background: Schizophrenia (SZ) is an illness whose heterogeneity has impeded understanding the underlying pathophysiology. In order to better understand this heterogeneity, here we used magnetoencephalography (MEG), 7T Magnetic Resonance Spectroscopy (MRS), and 7T fMRI during the Stroop task, on the same set of patients with first episode psychosis (SZ).
Methods: 22 minimally treated first episode SZ and 24 healthy controls (HC) matched for age, gender, and family socio-economic status were recruited. Neurometabolite levels were obtained from the bilateral anterior cingulate cortex using 7T proton MRS with an ultra-short echo time (5 ms) STEAM sequence, and referenced to water. MEG was performed in a 4D systems 148 channel magnetometer, and both the auditory evoked potential to 40 Hz tone clicks, and the resting state (eyes closed) were recorded. The fMRI BOLD response to the Stroop task was also recorded in a 7T scanner.
Results: The magnitude of the audio-evoked MEG responses to 40 Hz tone clicks was not significantly different between SZ and HC. However, many SZ showed high levels of theta-band activity during the resting state. The ratio of theta to alpha band activity in the anterior MEG sensors significantly differentiated SZ from HC, $P<0.05$ by t-test. MRS levels of glutamate and total NAA (tNAA), also separated HC from SZ, $P<0.05$, t-test. An across-groups whole brain analysis of the Stroop fMRI BOLD response to incongruent trials relative to congruent trials was performed ($p < .01$, FDR-corrected). The strongest signal came from a region in the left parietal (MNI, -30, -58.5, 48), and between-group analysis of the BOLD signal from a 4mm sphere surrounding this location revealed that the activation was greater for SZ than HC by t-test, $P<0.05$. The MEG theta/alpha ratio, and the left parietal fMRI Stroop effect, were significantly correlated, $r=0.45$, $P=0.005$. However, the fMRI Stroop was uncorrelated with the MRS tNAA ($r = -0.11$, $P=0.491$) and also uncorrelated with the MRS glutamate levels ($r = -0.16$, $P=0.334$).
Discussion: We speculate that the MEG and fMRI data, and the MRS neurometabolite levels, may reflect two relatively independent underlying pathological mechanisms in SZ. Possibly the MEG and fMRI results are indicative of dysfunction in long-range cortical-cortical networks, while the MRS data is more indicative of local neurometabolic dysfunction. Further exploration of SZ using multiple imaging modalities on the same subjects may help to untangle the underlying pathophysiological basis of the heterogeneity of this disorder.

T20. SEARCHING FOR NOVEL AUTOANTIBODIES WITH CLINICAL RELEVANCE IN PSYCHIATRIC DISORDERS

Mats Persson*[,1], Arasch Zandian[2], Louise Wingård[1], Hanna Nilsson[1], Evelina Sjöstedt[3], Daniel Johansson[1], David Just[2], Cecilia Hellström[2], Mathias Uhlén[2], Jochen Schwenk[2], Anna Häggmark-Månberg[2], Oscar Norbeck[1], Björn Owe-Larsson[1], Peter Nilsson[2]
[1]Karolinska Institutet; [2]Royal Institute of Technology; [3]Uppsala University

Background: Immunological reactions may have a role in subgroups of patients suffering from psychiatric disorders. Possible markers for such subgroups may be autoantibodies of currently unknown nature. If identified, they could indicate which patients that would benefit from immunomodulatory treatment in addition to standard interventions. Modern proteomic methods allow analyses of antibody binding to thousands of different human proteins, facilitating the identification of currently undiscovered autoantibodies.
Methods: We have explored the association between any seroreactivity in plasma samples from first episode psychosis patients against more than 2000 randomly chosen protein fragments derived from human proteins, and the development of disorders characterized by chronic or relapsing psychotic symptoms. Plasma from 53 patients and 41 non-psychotic controls were assessed; the clinical course of the patients were followed for a mean duration of 7 years. The plasma samples were analyzed for IgG reactivity to 2304 fragments (approx 100 a.a. residues in length) of human proteins using a multiplexed affinity proteomic technique, and positive hits validated for binding in two additional assays.