outcomes) and more flexible, but computationally demanding model-based behavior (i.e., implementing cognitive models). Model-based/model-free decision-making can be investigated using sequential decision tasks and has been shown to be associated with presynaptic striatal dopamine synthesis. During phases of psychotic remission in schizophrenia, dopamine synthesis in the dorsal striatum is reduced. We hypothesized that particularly model-free decision-making is impaired in schizophrenia during psychotic remission and is associated with (i) abnormal dopamine synthesis in dorsal striatum, (ii) aberrant task-activation in dorsal striatum, and (iii) cognitive difficulties in patients (e.g., reduced speed).

Methods: 26 patients with chronic schizophrenia, currently in psychotic remission, and 22 healthy controls (matched by age and gender) were enrolled in the study. Model-based/model-free decision-making was evaluated with a two-stage Markov decision task, followed by computational modeling of subjects’ learning behavior. Presynaptic dopamine synthesis was assessed by 18F-DOPA positron emission tomography and subsequent graphical Patlak analysis. Task-activation was measured by functional magnetic resonance imaging. Cognitive impairments were quantified by Trail-Making-Test A (among others). Associations between decision-making parameters, dopamine synthesis, task-activation, and cognitive impairments were tested by correlation analyses.

Results: Patients with schizophrenia showed selectively impaired model-free decision-making. 18F-DOPA uptake (i.e., presynaptic dopamine synthesis capacity) in the dorsal striatum was decreased in patients. Impaired model-free decision-making in patients correlated with (i) decreased dopamine synthesis in dorsal striatum, (ii) abnormal task-activation in dorsal striatum, and (iii) lower speed in Trail-Making-Test A.

Discussion: Results demonstrate an association of reduced dorsal striatal dopamine synthesis and brain activity with impaired model-free decision-making in schizophrenia, which potentially contributes to cognitive difficulties.

S147. FUNCTIONAL BRAIN CONNECTIVITY DATA IMPROVE CLINICAL OUTCOME PREDICTION IN YOUTH AT RISK FOR PSYCHOSIS

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Background: Improved outcome prediction in individuals at high risk for psychosis may facilitate targeted early intervention. Studies suggest that improved outcome prediction may be achieved through the use of neurocognitive or neuroimaging data, on their own or in addition to clinical data. This study examines whether adding resting-state functional connectivity data to validated clinical predictors of psychosis improve outcome prediction in the prodromal stage.

Methods: This study involves 137 adolescents and young adults at Clinical High Risk (CHR) for psychosis from the Shanghai At Risk for Psychosis (SHARP) program. Based on outcome after one-year follow-up, participants were separated into three outcome categories: good outcome (symptom remission, N = 71), intermediate outcome (ongoing CHR symptoms, N = 30), and poor outcome (conversion to psychosis or treatment-refractory, N = 36). Resting-state fMRI data were acquired for each participant and processed using the Conn toolbox, including rigorous motion correction. Multinomial logistic regression analysis and leave-one-out cross-validation were used to assess the performance of three prediction models: 1) a clinical-only model using validated clinical predictors from the NAPLS-2 psychosis-risk calculator, 2) an fMRI-only model using measures of functional connectome organization and within/between-network connectivity among established resting-state networks, and 3) a combined clinical and fMRI prediction model. Model performance was assessed using the harmonic mean of the positive predictive value and sensitivity for each outcome category. This F1 measure was compared to expected chance-levels using a permutation test with 1,000 sampled permutations in order to evaluate the statistical significance of the model's prediction.

Results: The clinical-only prediction model failed to achieve a significant level of outcome prediction (F1 = 0.32, F1-chance = 0.26 ± 0.06, p = .154). The fMRI-only model did predict clinical outcome to a significant degree (F1 = 0.41, F1-chance = 0.29 ± 0.06, p = .016), but the combined clinical and fMRI prediction model showed the best performance (F1 = 0.46, F1-chance = 0.29 ± 0.06, p < .001). On average, positive predictive values (reflecting the probability that an outcome label predicted by the model was correct) were 39% better than chance-level and 32% better than the clinical-only model. Analyzing the contribution of individual predictor variables showed that GAF functional decline, a family history of psychosis, and performance on the Hopkins Verbal Learning Test were the most influential clinical predictors, whereas modular connectome organization, default-mode and fronto-parietal within-network connectivity, and between-network connectivity among language, salience, dorsal attention, cerebellum, and sensorimotor networks were the leading fMRI predictors.

Discussion: This study’s findings suggest that functional brain abnormalities reflected by alterations in resting-state functional connectivity precede and may drive subsequent changes in clinical functioning. Moreover, the findings show that markers of functional brain connectivity may be useful for improving early identification and clinical decision-making in prodromal psychosis.

S148. MULTIMODAL BRAIN ANALYSIS IN PSYCHOSIS RISK – THE OULU BRAIN AND MIND STUDY

Abstract not included.

S149. CHANGES IN FRONTO-PARIETAL CONNECTIVITY IN SCHIZOPHRENIA: TMS AND FNIRS STUDY

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Background: One of the most prominent deficits in schizophrenia is impairment in executive function. This impairment is associated to aberrant function of the dorso-lateral prefrontal cortex (DLPFC)/Weinberger et al. 1986) and the fronto-parietal network (FPN) (Deserno et al. 2012). The FPN is involved in cognitive control (Seeley et al. 2007, Zanto & Gazzaley 2013). While correlations of activation of DLPFC and inferior parietal lobe (IPL) are well documented, fMRI based techniques cannot determine causal relationships of interactions between brain regions. We used Transcranial magnetic stimulation (TMS), which directly affects the stimulated brain region and connected brain areas (Valchev et al 2015) and therefore can be used to investigate causal interactions between brain regions. TMS stimulation to the DLPFC at 10 Hz may cause either putative increase or decrease of activation in the in the IPL, depending on whether connections are inhibitory or excitatory (Curtin et al 2019). We hypothesised that patients with schizophrenia would have slower reaction in IPL as a consequence of DLPFC stimulation.
S150. EMOTIONAL BEHAVIOUR IN HIGH-RISK AND FIRST-EPISODE PSYCHOSIS

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Background: Studies indicate that people with schizophrenia and first-episode psychosis experience deficits in their ability to accurately detect and display emotions through facial expressions, and that functioning and symptoms are associated with these deficits. This study aims to examine how emotion recognition and facial emotion expression are related to functioning and symptoms in a sample of individuals at ultra-high risk, first-episode psychosis and healthy controls.

Methods: During fMRI, we combined the presentation of emotional faces with the instruction to react with facial movements predetermined and assigned. 18 patients with first-episode psychosis (FEP), 18 individuals at ultra high risk of psychosis (UHR) and 22 healthy controls (HCs) were examined while viewing happy, sad, or neutral faces and were instructed to simultaneously move the corners of their mouths either (a) upwards or (b) downwards, or (c) to refrain from movement. The subjects’ facial movements were recorded with an MR-compatible video camera.

Results: Neurofunctional and behavioral response to emotional faces were measured. Analyses have only recently commenced and are ongoing. Full results of the clinical and functional impact of behavioral and neuroimaging results will be presented at the meeting.

Discussion: Increased knowledge about abnormalities in emotion recognition and behaviour as well as their neural correlates and their impact on clinical measures and functional outcome can inform the development of novel treatment approaches to improve social skills early in the course of schizophrenia and psychotic disorders.