S158. REWARD ALTERATIONS IN ANTIPSYCHOTIC NAÏVE FIRST-EPISODE-PSYCHOSIS PATIENTS BEFORE AND AFTER TREATMENT WITH A PARTIAL DOPAMINE AGONIST
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Background: Alterations of the brain reward system is a common finding in patients with psychoses and it may be affected by antipsychotic medication. There are however only few longitudinal studies on medication effect and the effect of a partial dopamine agonist have not previously been examined in patients. The aim of the present study is to explore reward abnormalities in first episode psychotic patients and matched healthy controls (HC) before and after treatment with a partial dopamine agonist (aripiprazole), and relate the findings to dopamine synthesis capacity (F-DOPA-PET), glutamate and GABA levels in the brain (MRS at 3T) and treatment outcome. Here we present preliminary baseline and follow up analyses on functional magnetic resonance imaging (fMRI) only.

Methods: The project is a part of a multimodal prospective cohort study. Reward related brain activity was examined with fMRI using a variant of the Monetary Incentive Delay Task before and after 6 weeks, where patients were treated with individual doses of aripiprazole. Psychopathology was measured with the Positive and Negative Syndrome Scale (PANSS). Whole brain voxel-wise group comparison was performed at baseline and follow up using two sample t-test with a corrected cluster significant threshold of P<0.05. Likewise, the effect of time and group time interaction was analyzed voxel-wise.

Results: Inclusion is ongoing and data have been analyzed for 19 patients, age 22.9(4.6), 9 males (47%) and 24 HC, age 22.1(2.7), 11 males (46%). Mean medication dose was 11.7 (6) mg aripiprazole at follow up.

Psychopathology: At baseline patients were moderately ill with a mean PANSS total score of 69 (14). Paired t-test showed a significant reduction over time for PANSS total score to 57 (12) (P<0.001), with significant improvements in PANSS positive, PANSS negative and PANSS general scores (all p<0.05).

fMRI: There were no group differences at baseline.
At follow up, patients had an increased signal in medial frontal cortex and Anterior Cingulate Cortex (ACC) compared to HC during anticipation of monetary gain. During outcome evaluation, patients likewise had an increased signal in right striatum and paracingulate gyrus in the win contrast, increased signal in left ventral part of striatum and ACC in the lose contrast, and increased signal in right striatum and ACC in the miss contrast compared to HC. There was only a significant effect of time in patients in the anticipation to win contrast and no significant group time interaction.

Discussion: The data represent work in progress and should be taken with precaution. The group-differences at follow up which were not found at baseline may suggest that treatment with a partial dopamine agonist lead to alterations of reward processing in patients. This is further supported by the effect of time in patients in the anticipation to win contrast. The data collection is still ongoing, and we expect to increase the size of the cohort and plan to relate the findings to measures of dopamine, GABA, glutamate and psychopathology.

S159. REDUCED PROCESSING SPEED IN SCHIZOPHRENIA IS MEDIATED BY WHITE MATTER INTEGRITY
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Background: Meta-analysis suggest that processing speed deficit is the largest single cognitive impairment in schizophrenia. Processing speed predicts functional outcome and indicates a vulnerability marker for schizophrenia. Several authors have proposed that abnormalities in white matter is related to reduced processing speed in schizophrenia. The purpose of this research was to investigate the relationship between processing speed and structural properties of white matter pathways in schizophrenia and healthy controls.

Methods: The data using this study were from the SchizConnect. Participants included 64 patients with schizophrenia and 71 healthy controls. Diffusion tensor imaging (DTI) method was used to measure fractional anisotropy along white matter tracts. Group differences in white matter integrity-inferred from fractional anisotropy (FA), processing speed, verbal memory were examined. Mediation analysis were applied to inspect the relationship between FA and cognitive performance.

Results: Participants with schizophrenia had significantly reduced processing speed, verbal memory deficits, and whole-brain fractional anisotropy deficit. There were significant group differences in white matter integrity of the left thalamus occipital, right extreme capsule, and right thalamus occipital. FA in left thalamus occipital and right extreme capsule mediated group differences in processing speed, but not other cognitive domains.

S160. INTERACTIONS BETWEEN BOTTOM-UP AND TOP-DOWN ATTENTION DURING WORKING MEMORY ENCODING: EVALUATION OF AN FMRI PARADIGM FOR THE STUDY OF COGNITIVE DYSFUNCTION IN SCHIZOPHRENIA
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Background: Patients with schizophrenia suffer from profound impairments of working memory and selective attention. These cognitive domains show a considerable overlap on both the behavioral and neurophysiological level. Importantly, selective attention appears to be crucial for the selection of information to be encoded into working memory. A number of studies have demonstrated that the efficiency of this “gatekeeper” function influences working memory performance. Furthermore, behavioural evidence indicates, that patients with schizophrenia have a specific deficit when required to suppress irrelevant but highly salient visual information during working memory encoding. Therefore, elucidating the neurophysiological mechanisms underlying the “gatekeeper” function of selective attention for working memory is highly relevant for understanding this deficit in schizophrenia. The aim of the current study was to investigate the neurophysiological correlates of encoding either salient or non-salient information in the presence of distractors of opposite saliency using functional magnetic resonance imaging (fMRI). Furthermore, we wanted to study the impact of additional top-down information guiding the selection of task relevant information.

Methods: 35 healthy volunteers underwent fMRI in a 3 T Siemens Trio scanner. During a change detection task four Gabor patches (two flickering and two non-flickering) with varying orientations were shown and participants had to memorise the orientations of the Gabor patches. A colored fixation cross was displayed before the stimuli either cueing two (predictive cue) or four (non-predictive cue) Gabor patch locations resulting in a 2 x 2 design of four conditions with the factors salience (flickering vs. non-flickering)
and cue (predictive cue vs. non-predictive cue). During retrieval a single Gabor patch was displayed, and participants reported if the orientation was the same or had changed in that location. At the beginning of each block participants were instructed to either encode the flickering or non-flickering patches (targets) whose location could either be cued or uncued. In 80% of trials, a target was probed during retrieval. Data analysis in Brain Voyager included standard data preprocessing. Additionally, a multi-scale curvature driven cortex based alignment procedure was used to minimise macro-anatomical variability between subjects. Subsequently, functional data were analysed using a random-effects multi-subject general linear model (p<0.05, FDR corrected). Functional connectivity analysis was performed using Granger Causality Mapping.

Results: Participants were able to preferentially encode task-relevant information in all four conditions. During encoding, they showed activation in a distributed network of fronto-parietal and visual areas. For salient compared to non-salient distractors, we observed increased functional connectivity between attention-related areas and extrastriate visual cortex. This difference was more pronounced for trials with a predictive compared to non-predictive cue.

Discussion: We were able to map the cerebral networks responsible for determining the contents of working memory. The observed patterns of connectivity indicate that core regions of the fronto-parietal network involved in both working memory and selective attention play a crucial role in the filtering of information by modulating the processing of information in visual areas. Our current findings provide the basis for studying the neurophysiological underpinnings of the interaction between impairments of working memory and selective attention in schizophrenia.

S161. FUNCTIONAL BRAIN NETWORKS INVOLVED IN ATTENTIONAL BIASING IN SCHIZOPHRENIA
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Background: Although the symptomatology in schizophrenia is variable, many of the cognitive deficits that are associated with the illness, including impairments in attention, working memory, verbal learning and executive functions, persist over time from the prodrome to the chronic phase. One of the cognitive domains showing pronounced deficits is executive function, which is the ability to adaptively adjust behavior in the face of changing environmental demands. Attentional biasing is one aspect of executive function that attenuates conflict between competing stimuli (or competing features of a stimulus) via the top-down regulation of attention. The goal of this study was to use functional magnetic resonance imaging (fMRI) to isolate the brain activity related to differences in levels of attentional biasing in schizophrenia patients, where these levels were varied from trial-to-trial by manipulating the number of relevant stimulus dimensions.

Methods: Participants - Twenty-three schizophrenia patients and twenty-one healthy volunteers, matched on age and gender, were recruited from the Vancouver area.

Task – The task involved performing three discrete tasks in alternation: judging whether shapes are blue or red, judging whether numbers are odd or even, and judging whether letters are uppercase or lowercase. Each stimulus contained either one dimension that cued a task in the task set (e.g. the numeral ‘2’ in white ink), two dimensions (e.g. the numeral ‘2’ in blue ink), or three dimensions, such that all three tasks in the set are cued (e.g. the word ‘TWO’ written in blue ink). Each stimulus was presented in the center of the screen and the judgment to be performed was cued with a single word followed by a question mark.

Results: The fMRI data was analyzed using Constrained Principal Component Analysis, which identifies brain networks common to all participants and indexes the activity of each network for each participant. Three components were extracted for further examination.

Component 1 displayed activations located in the visual cortices, parietal lobes, primary motor areas, supplementary motor area (SMA), dorsal anterior cingulate cortex (dACC), and cerebellum. The statistical analysis indicated that this component was reliable but did not differentiate between patients and volunteers.

Component 2 displayed activations in the occipital lobes, dACC, SMA, parietal lobes and primary motor areas, and deactivations in the medial prefrontal cortices and the posterior cingulate/precuneus. The statistical analysis indicated that the activity in this component was reliable, and became stronger as stimulus dimensions increased. However, the patients did not increase activity to the same degree as the volunteers in the most challenging condition.

Component 3 displayed activations in the occipital lobes, hippocampi, and left parietal and primary motor areas as well as deactivations in superior and middle frontal gyri. The statistical analysis indicated that this component was reliable, but activity levels did not differentiate between patients and volunteers.

Discussion: The results indicate that patients and volunteers activated the same networks while performing the attentional biasing task. However, the statistical analysis of Component 2 suggests that patients display an inefficient pattern of brain activity, such that they have higher levels of activity than volunteers when little attentional biasing is required and significantly lower levels of activity than volunteers when high levels of attentional biasing was required. This pattern of results is suggestive of inefficient neural activity, particularly at higher levels of task difficulty, a finding which has previously been described in the schizophrenia literature.

S162. IMPACT OF THE PRESENCE OF A PEER WORKER IN AN EARLY INTERVENTION UNIT FOR YOUNG ADULTS WITH MENTAL ILLNESS (JADE)
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Background: A current trend in health care and in particular mental health care is to reduce the divide between patients and their community, which is encouraging new practices as well as new health care professions. The concept of a peer worker, a previous mental health care user, is revealing itself to be complementary to that of other health care workers as well as effective (Davidson et al., 2012). One aspect of the peer worker given his or her previous experience is as an intermediary for communication. In mental health care units such as ours (Geneva based JADE program for early intervention in mental health) the introduction of a peer worker as a new concept can lead to many benefits but also carries questions and uncertainties.

Methods: In order to assess the impact of a peer worker’s presence in our unit over a period of 2 months, we submitted questionnaires to patients and staff. We present results from questionnaires from 7 patients and 15 staff. In order to further explore the subjective appreciation of this integration, we included open ended questions to also assess constructive suggestions from patients and staff.

Results: Data collection is in progress.

Discussion: The impact of the presence of peer-worker in our mental health care unit will be discussed.

S163. FEASIBILITY STUDY: MEASURES OF SLEEP AND PHYSICAL ACTIVITY IN PEOPLE WITH SCHIZOPHRENIA
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Abstracts for the Sixth Biennial SIRS Conference