T201. THE STUDY OF WHITE MATTER MATURATION IN THREE POPULATIONS OF GENETIC HIGH RISK FOR SCHIZOPHRENIA INDIVIDUALS SPANNING THE DEVELOPMENTAL TIMELINE

787 biologists, shared the same mean decade of birth, the 1780s, and essentially the same geographic origin in Western Europe. The mathematicians showed a very significant SCZ liability-like, GP1-coincident seasonality while the biologists showed an even more significant SCZ resistance-like, GP2-coincident seasonality. The latter effect was particularly strong among naturalists, anatomists and other groups representing biological "observationalism" as opposed to "experimentalism."
Discussion: The findings are discussed in light of a) new evidence that the annual photoperiod is indeed alone responsible for both peaks of general births, with the GP1 and the GP2 being caused by maternal periconceptional exposure to, respectively, the summer-solstice sunlight maximum and the winter-solstice minimum, and b) an approach/withdrawal theory of lateralization of basic emotions where the left cerebral cortex would handle external stimuli eliciting complacent emotions towards external realities while the right cortex would handle internal stimuli eliciting disdain for those realities.

T199. DEVIANT CORTICAL SULCATION RELATED TO SCHIZOPHRENIA, BUT NOT COGNITIVE DEFICITS, LIKELY PREDATE BRAIN DEVELOPMENT IN THE SECOND TRIMESTER

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Background: Gestational disruptions are linked to the risk of schizophrenia; but in most cases, there is a lack of a clear history or observable anomaly indicating that the disruptions are likely to be subtle (Murray et al., 2017). The time-locked development of cortical sulci in a human embryo is highly sensitive to developmental disruptions (Chi et al., 1977). We can retrospectively infer the likely timing of embryonic/fetal disruption in schizophrenia by studying the structure of major cortical sulci that represent lobar development in adults with schizophrenia.
Methods: Anatomical T1 MRI scans from a publicly available dataset (COBRE) of 68 patients with schizophrenia and 72 controls were used to evaluate the sulcal depth. 5 major primary sulci that are invariable, representing lobar development (calcarine sulcus, superior temporal sulcus, superior frontal sulcus, interparietal sulcus and inferior frontal sulcus) with formation representing distinct developmental periods (16, 23, 25, 26 and 28 weeks respectively (Chi et al., 1977)) were chosen. Sulcal depth was measured using Morphologist interface of BrainVISA 4.5 (http://brainvisa.info/). Following the construction of 3-dimensional models of cortical folds, various sulci were automatically classified using a probabilistic algorithm with maximum depth computed for each identified sulcus. The 5 sulci were consistently labeled automatically across all subjects. The identified sulci were visually inspected to ensure that the boundaries are in accordance with Ono's Atlas of Cerebral Sulci (Ono et al., 1990).
Results: A repeated measure ANOVA with 5 sulci and 2 hemispheres as within-subject factors and gender, age and intracranial volume as covariates revealed a significant between-subjects effect for diagnosis ($F[1,134]=14.8$, $p=0.0002$). Gender ($F[1,134]=7.4$, $p=0.007$) and age ($F[1,134]=4.5$, $p=0.035$) also had significant effect in the model. Parameter estimates revealed a significant effect of diagnosis (Controls>Patients) for left superior temporal ($t=3.2$, $p=0.002$), right superior temporal ($t=2.8$, $p=0.006$), right inferior frontal ($t=2.7$, $p=0.007$) and left calcarine ($t=2.2$, $p=0.03$) sulci. 5 non-collinear factors representing the 5 bilateral sulci were obtained using varimax rotation, and related to overall MATRICS standardized composite score in patients using multiple regression. The depth of the superior frontal sulcus was the only predictor of the variation in the cognitive score ($F[1,54]=8.7$, $p=0.005$).
Discussion: The above findings suggest that the gestational cortical disruption underlying schizophrenia is likely to predate, if not, coincide with the appearance of calcarine sulcus (i.e. 16 weeks, early second trimester) and affects frontal, temporal and occipital lobes. Nevertheless, the burden of cognitive deficits may relate specifically to aberrant superior frontal development occurring in late second trimester.

T200. DISTINCT ASSOCIATIONS OF MOTOR DOMAINS WITH THE GENETIC RISK FOR PSYCHOSIS – DIFFERENT PATHWAYS TO MOTOR ABNORMALITIES IN SCHIZOPHRENIA?

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Background: Aberrant motor function is an integral part of Schizophrenia. In fact, abnormalities are frequently found in patients, in populations at risk, and in unaffected relatives. Motor abnormalities are suspected to be relevant for the clinical outcome and could probably predict the conversion from at-risk individuals to schizophrenia. Furthermore, motor function and has been argued as endophenotype of the disorder. Yet, which particular motor domain may classify as a potential endophenotype is unknown. We aimed to compare schizophrenia patients, unaffected first degree relatives and healthy controls for different motor domains. We expected impairments in all domains in patients and in some domains in relatives.
Methods: We included 43 schizophrenia patients, 34 unaffected first degree relatives of schizophrenia patients and 29 healthy control subjects, matched for age, gender and education level. We compared motor function of five domains between the groups. The domains comprise neurological soft sings (NSS), abnormal involuntary movements (dyskinesia), Parkinsonism, complex fine motor function applying the coin rotation task as well as finger tapping. Furthermore, we tested the association of motor function of the five domains with working memory, frontal lobe function and nonverbal intelligence for each group separately using within-group bivariate correlations.
Results: Schizophrenia patients showed poorer motor function in all tested domains compared to healthy controls. First-degree relatives had intermediate ratings with aberrant function in two motor domains. In detail, relatives had significantly more NSS and performed poorer in the finger tapping task than controls. In contrast, in relatives complex fine motor function was intact. Relatives did not differ from controls in dyskinesia or Parkinsonism severity.
Discussion: Taken together, schizophrenia patients have motor abnormalities in all tested domains. Thus, motor abnormalities are a key element of the disorder. Likewise, first degree relatives presented motor deficits in two domains. A clear difference between relatives and healthy controls was found for NSS and finger tapping. Thus, NSS and finger tapping may be a potential marker of vulnerability for schizophrenia. The lack of association between genetic risk and dyskinesia or Parkinsonism suggests distinct pathobiological mechanisms in the various motor abnormalities in schizophrenia.

T201. THE STUDY OF WHITE MATTER MATURATION IN THREE POPULATIONS OF GENETIC HIGH RISK FOR SCHIZOPHRENIA INDIVIDUALS SPANNING THE DEVELOPMENTAL TIMELINE

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Background: While the etiology of schizophrenia (SZ) is still unclear, it has been characterized as a neurodevelopmental disorder because patients exhibit deviations from normal maturational trajectories that are evident prior to the onset of psychotic symptoms. White matter (WM) has been purported to play a central role in the development of SZ, however, the timing and nature of WM changes in SZ is still poorly understood. This study uses diffusion imaging from three independent Genetic High Risk (GHR) populations spanning the developmental timeline from infancy to young adulthood. The aim of this study is to understand the extent and the time-course of WM maturational pathologies as a function of age and genetic risk for psychosis.
Methods: Two datasets of 3T diffusion-weighted images of children aged 7 to 12 (24 HC and 16 at GHR) and young adults aged 19 to 29 (26 HC and 43 GHR) were collected at the Massachusetts Institute of Technology. The third dataset of 3T images of infants aged 2 years (35 HC and 18 GHR) was collected at the University of North Carolina – Chapel Hill. Whole brain two-tensor tractography was performed and 4 bilateral WM tracts (arcuate fasciculus (AF); inferior longitudinal fasciculus (ILF); cingulum bundle (CB); superior longitudinal fasciculus-ii (SLF-ii)), were extracted utilizing an atlas-guided fiber clustering algorithm. The fractional anisotropy of the tissue (FA-t) was obtained. We carried out group comparisons of FA-t between GHR and HCs utilizing Mann-Whitney-U tests and Cohen's d effect sizes for each WM tract.
Results: Preliminary analyses reveal significant reductions in FAt between GHR and HC in the right CB ($p = 0.013$) in the child GHR population. This is mirrored by medium to large effect sizes in the bilateral CB in GHR children (CB-left, $d = 0.51$; CB-right, $d = 0.79$). Reductions in FAt in the adult GHR population within the right CB was the largest effect observed in the adult analysis (CB-right, $d = 0.46$). Effect sizes in the bilateral CB were minimal in the infant GHR population (CB-left, $d = 0.14$, CB-right, $d = 0.11$). Significant decreases were also seen in the right SLF-ii in the adult GHR population ($p = 0.012$), but not in the infant or child GHR populations, though the reductions in FAt in the child GHR population exhibited a small effect ($d = 0.35$). All other white matter tracts in the adult analysis showed minor effects ranging from $d = 0.033$ (ILF-right) to 0.28 (ILF-left). The children and infant population also exhibited small effect sizes for all other tracts, with the child GHR dataset ranging from 0.036 (ILF-left) to 0.41 (ILF-right) and the infant GHR dataset ranging from $d = 0.038$ (SLF-left) to 0.34 (ILF-left).
Discussion: Our preliminary results suggest that abnormal WM maturation may occur in the right CB and right SLF-ii in individuals with increased genetic risk for SZ, specifically after early childhood (7 to 12 years) and into adulthood (19 to 29 years). The CB and SLF-ii are highly implicated in working memory performance, an ability that retrospective studies have shown begins to decline during the peripubertal period in those that develop SZ (~7 to 9 years). The lack of structural findings in GHR infants, may suggest that WM alterations are more likely to arise later in development, thereby possibly identifying childhood as a vulnerable period. Taken together, the preliminary results of this study provide possible evidence of subtle divergences from a healthy WM maturational trajectory in the right CB and right SLF-ii in early to late childhood that may persist into adulthood and these deviations may contribute to cognitive phenotypes described in other studies.

T202. HUMOR-SKILLS TRAINING IN PATIENTS WITH SCHIZOPHRENIA: EFFECTS ON SYMPTOMS AND SOCIAL FUNCTIONING

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Background: Humor can provide a method of coping with a variety of stressful situations. Training of humor-related skills has proven effective in clinical samples, although humor training in patients with schizophrenia is relatively rare.
Methods: In the present study, patients with schizophrenia have been randomly assigned to either a training of humor abilities or a training of social skills. Training effects on measures of psychopathology, psychosocial functioning and stress were compared between groups.
Results: Preliminary analyses revealed that level of negative symptoms, stress and psychosocial dysfunction were significantly reduced in the humor group over the course of the training.
Discussion: These results suggest that humor training may improve important clinical and functional outcomes in patients with schizophrenia.

T203. ILLICIT DRUGS USE AND ULTRA-HIGH RISK (UHR) FOR PSYCHOSIS STATUS IN A LATIN-AMERICAN SAMPLE

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Background: In recent years, a number of investigations have evaluated the effect of cannabis use on the risk of presenting ultra-high risk for psychosis (UHR) status as well as its influences on transition rate, suggesting a dose-dependent interaction. On the other hand, the association between cocaine (snorted or smoked) - an increasing health issue in several countries worldwide - and the UHR state was not appropriately examined. Also, exposure to other psychotomimetic drugs, as amphetamines and lysergic acid diethylamide (LSD), has not been investigated yet. We sought to examine differences in the prevalence of drug use between UHR subjects and epidemiologic controls (EC).
Methods: Over 2500 individuals from the city of São Paulo (Brazil), aged between 18 and 30 years old, were screened with the Prodromal Questionnaire. Subjects with scores higher than 18 points in the positive subscale were invited to be thoroughly assessed with the application of SIPS (Structured Interview for Psychosis-Risk Syndromes). Drug use (lifetime use, age of first use and more intense use) was assessed using South Westminster scale.
Results: 100 individuals presented UHR state; other 110 were enrolled as EC. A subsample of 50 UHR subjects and 82 HC with data on drugs consumption were evaluated herein. UHR subjects history of lifetime drug use was: 19 (38%) cannabis; 5 (10%) snorted cocaine; 1 (2%) crack; 1 (2%) amphetamine; 2 (6.9%) LSD. EC history of lifetime drug use was: 20 (24.4%) cannabis; 6 (7.3%) snorted cocaine; 0 crack; 2 (2.4%) amphetamine; 1 (1.2%) LSD. No differences were observed for snorted cocaine ($p=0.589$), crack ($p=0.379$), amphetamine ($p=1.0$), or LSD ($P=0.167$). At a trend level, cannabis lifetime use ($p=0.096$) was more prevalent in the UHR group. Additional analyses showed that UHR subjects initiate cannabis use at earlier age than EC ($p=0.006$). In this group, 20% of subjects had used cannabis prior to 15 years of age, in comparison to 3.6% in the EC group.
Discussion: Our results reinforce the view that cannabis use is linked to psychosis risk and that subjects at early age of exposure are at greatest risk. Nonetheless, studies with larger number of participants are warranted to confirm our findings, particularly on the lack of association between less frequently consumed drugs and the UHR for psychosis state.

T204. NOVEL VIRTUAL REALITY SOCIAL SKILLS TRAINING FOR INDIVIDUALS WITH SCHIZOPHRENIA

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