Title

O10.2. DEFICIENT VISUAL ODDBALL STIMULUS PROCESSING PREDICTS PSYCHOSIS ONSET: RESULTS FROM THE NORTH AMERICAN PRODROME LONGITUDINAL STUDY

Journal

Schizophrenia bulletin, 46(Suppl 1)

ISSN

1787-9965

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Publication Date

2020-05-01

Peer reviewed

received technology-enhanced relapse prevention program. Both groups were followed for 6 months. Patients were between 18 and 60 years old; had a diagnosis of schizophrenia, schizoaffective disorder, or psychotic disorder not otherwise specified; and were currently hospitalized or had been hospitalized within the past 30 days at consent. The first cohort received usual care; the second cohort received the Health Technology Program (HTP) a technology-enhanced relapse prevention program. HTP included medication treatment guided by a computer decision support system for the prescriber, a smartphone application for patients that supported medication adherence and other coping strategies, a web-based patient and family psycho-educational intervention, and web-accessed cognitive behavioral therapy for paranoia and hallucinations. A mental health technology coach provided technical support, and developed a personalized, structured, relapse prevention plan with each participant that identified individual relapse precipitants and determined which HTP components should be employed to address them. All patients received computers and Android smartphones to insure access to the interventions. Days spent in a psychiatric hospital during 6 months after discharge was assessed. The Heinrichs Carpenter Quality of Life Scale was completed at baseline and six months.
Results: The study included 438 patients. Control participants (N = 89; 37 females) were enrolled first and received usual care for relapse prevention, and followed by 349 participants (128 females) who received the HTP. Days of hospitalization were reduced by 4 days (Mean days: b = -4.25, 95% CI: -8.29; -0.21, P = 0.039) during follow-up in the intervention condition compared to control. Finally, using Heinrichs Carpenter Quality of Life total score at month 6 as an outcome, we found no significant effect of HTP ($\beta = 0.02$, $t(345) = 0.43$, P = 0.668).
Discussion: Recently hospitalized patients with schizophrenia who received an integrated technology informed relapse prevention program (HTP) experienced fewer days in the hospital compared to those who received usual care in the six months following their discharge. Given the high patient burden and costs of even a single day spent in a psychiatric hospital, estimated at $1358 per day based on inflation adjusted results from a recent study, our findings imply total savings in psychiatric inpatient expenditures of $5772 during the first 6 months after discharge on average. However, reduction in hospitalization days did not result in a parallel improvement in functioning as assessed by the Quality of Life Scale.
Although the control and experimental cohorts were comparable in many characteristics, the quasi–experimental design represented by sequential cohorts rather than a true concurrent randomized controlled trial represents a limitation. The results of the study suggest that technology enhanced treatments that are tailored to patient needs can be implemented in a range of clinical settings in the US to patients at high risk of hospitalization and that the intervention can reduce subsequent hospitalization days. Future research should address limitations in the current study design and will benefit from the development of technology applications that can be available on a single flexible platform.

O10. Oral Session: CHR/ RISK

O10.1. MATERNAL PRENATAL C-REACTIVE PROTEIN, NEURODEVELOPMENT AND OTHER RISK FACTORS FOR PSYCHOSIS IN ADOLESCENT OFFSPRING IN THE NORTHERN FINLAND BIRTH COHORT 1986

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Background: Prenatal infection is associated with brain structural and functional abnormalities, and may increase risk for psychosis through a direct effect on neurodevelopment. Proinflammatory immune response may be a common mechanism through which various infections exert their harmful effect, but studies of prenatal maternal inflammatory markers and offspring neurodevelopment are scarce. We examined the associations of maternal prenatal C-reactive protein (CRP) levels with psychosis risk factors in adolescent offspring including markers of neurodevelopment and cannabis use.
Methods: This study used a longitudinal birth cohort, the Northern Finland Birth Cohort 1986 (NFBC 1986), followed up to age 16 years (n=6,985/9,432, 76% follow-up). CRP was measured in maternal sera collected in pregnancy. In offspring, school performance was measured at age 7 and 16y; psychotic experiences and cannabis use was measured at age 16. Controlling for offspring sex, maternal education level, maternal body mass index during pregnancy, smoking during pregnancy and alcohol use during pregnancy using regression analysis, we tested associations of CRP with offspring measures. We also tested for mediation, specifically if adolescent cannabis use mediated the associations between maternal CRP and offspring psychotic experiences and school performance.
Results: Based on data from a minimum of 4,153 participants, after controlling for offspring sex, maternal education level, maternal body mass index during pregnancy, smoking during pregnancy and alcohol use during pregnancy, maternal CRP was associated with adolescent neurodevelopmental markers, including psychotic experiences (odds ratio=1.13, 95% CI=1.00–1.29) and academic performance at age 16 years (beta=0.063, SE=0.013, 95% CI=0.037–0.089). Maternal CRP was also associated with adolescent cannabis use (odds ratio=1.27, 95% CI=1.11–1.46). Cannabis use appeared to mediate a small amount of the associations between maternal CRP and both psychotic experiences and academic performance.
Discussion: These results support a neurodevelopmental role for maternal prenatal infection and offspring psychosis but also suggest an indirect effect through increasing risk of exposure to cannabis. Maternal infection and immune activation may impact on brain circuitry involved in impulsivity, increasing behaviours such as cannabis use that are separately associated with psychosis. The results of this study give clues regarding the mechanism of the maternal inflammation – psychosis association and add to our understanding of the complex neurodevelopmental processes predating psychosis.

O10.2. DEFICIENT VISUAL ODDBALL STIMULUS PROCESSING PREDICTS PSYCHOSIS ONSET: RESULTS FROM THE NORTH AMERICAN PRODROME LONGITUDINAL STUDY

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Background: Clinical outcomes vary among young people with the psychosis risk syndrome (PRS), with approximately 20% of individuals progressing to a psychotic disorder over 2–3 years and 30% achieving clinical remission. The identification of neurophysiological abnormalities associated with schizophrenia that predate and predict psychosis onset may enhance the accuracy of clinical outcome prediction in the PRS and help elucidate the

pathogenic mechanisms of psychosis onset. Auditory P300 event-related potential (ERP) component amplitude reductions are well established in schizophrenia and reflect early attention-mediated information processing deficits. Recent studies employing auditory oddball tasks have shown that P300 amplitude deficits in PRS individuals are associated with later clinical outcomes, including both conversion to full-blown psychosis and remission from the at-risk state. The present study examined whether these effects extend to P300 in the visual modality using visual oddball task data collected as part of the North American Prodrome Longitudinal Study. Specifically, we evaluated whether visual P300 amplitudes are reduced in the PRS and predict future clinical outcomes.

Methods: 540 individuals meeting PRS criteria and 229 healthy individuals completed baseline EEG recording during a visual oddball task. Visual P300 subcomponents were measured in response to two stimulus types: (1) infrequent target stimuli, reflecting top-down allocation of attention (target P3b), and (2) infrequent non-target novel distractor stimuli, reflecting bottom-up orienting of attention (novelty P3a). P300 amplitudes of PRS participants who converted to psychosis (n=70) were compared with those of PRS non-converters who were followed clinically for 24 months and continued to be symptomatic (n=131) or fully remitted from the PRS (n=87).

Results: Group comparison effects did not differ by stimulus type. Visual P300 amplitudes were not significantly reduced in the PRS group relative to healthy individuals (p=.25). However, baseline target P3b and novelty P3a amplitudes were reduced in PRS individuals who later converted to psychosis relative to all PRS non-converters, including those who remitted (p=.006, d=.44) and those who remained symptomatic (p=.015, d=.37), as well as healthy individuals (p=.001, d=.44). Baseline P300 amplitudes were similar among healthy controls, PRS remitters, and PRS individuals who remained symptomatic (ps>.45). Moreover, visual P300 amplitudes differentiated future psychosis converters after accounting for PRS symptom severity. Finally, both target P3b and novelty P3a amplitudes predicted the time to psychosis onset in PRS participants (p=.03 and p=.02, respectively), such that more deficient P300 amplitudes were associated with shorter time to conversion.

Discussion: Baseline visual P300 amplitudes were reduced in future PRS converters relative to non-converters, with effect sizes comparable to those reported in previous auditory P300 studies of the PRS. Results implicate visual P300 as a neurophysiological vulnerability marker that predicts clinical outcomes among PRS individuals, including future transition to psychosis. Accordingly, together with prior auditory P300 studies, results suggest that P300 may have the potential to contribute to personalized early intervention in the PRS by distinguishing individuals with the greatest risk for psychotic illness, who require the most aggressive treatment, from those who may need minimal intervention.

O10.3. EARLY CHILDHOOD DEVELOPMENT AND LATER PSYCHOTIC EXPERIENCES: FINDINGS FROM THE RAINE STUDY

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Background: Early childhood development is considered to be the most critical developmental phase throughout the lifespan. Cognitive and motor dysfunction are hallmark features found along the psychosis spectrum and have also been shown in young people who report subclinical psychotic experiences (PE). Whether such deficits can be detected in infancy is not yet known. The aim of the present research was to examine early childhood developmental skills and their association with PE in childhood and adolescence.

Methods: Data was taken from the Western Australia Pregnancy Cohort (Raine) Study, a pregnancy cohort study in which 2,868 infants were enrolled. Early childhood development was measured at age 1, 2 and 3 using the Infant Monitoring Questionnaire (IMQ; now the Ages and Stages questionnaire. Outcome of interest: PE was measured at age 10 via parent-report, and at age 14 and 17 via self-report by the participants using the 2 items ('hearing things' and 'seeing things') from the Child Behaviour Checklist (CBCL)/Youth Self-Report (YSR) thought problems subscale. The PE group included any participant who endorsed either or both of the items at any of the 3 time-points. The PE group was further subdivided into those who endorsed transient PE (one time-point) or recurring PE (2 or more time-points). Random effects logistic regression models were performed to investigate the relationship between early childhood development and later risk. Developmental time specific investigations (at age 1, 2 and 3 years of age separately) were also conducted using logistic regressions. Cumulative risk based on category specific deficits at age 3 was also calculated. This analysis was also applied to compare the PE group vs. controls, the transient PE group vs. controls and the recurring PE group vs. controls.

Results: In the first 3 years of life, lower scores in communication (adjusted OR = 1.32, 95% CI = 1.01–1.72, p = 0.05) and adaptive (problem-solving) (adjusted OR = 1.26, 95% CI = 1.01–1.59, p = 0.048) skills were found to be predictive of PE in childhood and/or adolescence. For the age specific analysis, adaptive skill deficits specifically at 1 year of age predicted PE (adjusted OR = 1.18, 95% CI = 1.03–1.35, p = 0.017), while at 2 years of age, deficits in communication (adjusted OR = 1.35, 95% CI = 1.18–1.54, p<0.001) and adaptive skills (adjusted OR = 1.25, 95% CI = 1.08–1.45, p<0.005) predicted PE. Importantly, at 3 years of age, deficits in any of the 5 categories (communication, gross motor, fine motor, adaptive and personal social) were predictive of PE. Deficits (lowest 10th percentile) in 1–2 categories at 3 years of age led to an almost a 2-fold increase risk of having a PE (adjusted OR = 1.94, 95% CI = 1.38–2.71, p < 0.001), while deficits in 3–5 categories led to a 3-fold increased risk of having a PE (adjusted OR = 3.02, 95% CI = 1.65–5.50, p = <0.001). When subdividing PE into those with transient and recurring PE, different patterns emerged, in which motor deficits in the first 3 years of life were more associated with the recurring PE group.

Discussion: The present research suggests that lower scores in early childhood developmental skills in the first 3 years of life are strongly associated with childhood and adolescent PE. Results showed that deviances in communication and problem-solving abilities during the first 3 years of life are particularly associated. At age 3 specifically, deficits in all domains of development are predictive of PE, and the greater the number of category deficits, the greater the risk. Differing patterns of development emerge for the transient PE and recurring PE groups. The findings enlighten the understanding of the neurodevelopmental origins of early onset PE for a proportion of individuals.

O10.4. THE ROLE OF CONTEXTUAL FACTORS AND ASSESSMENT STRATEGIES IN THE ACCURATE SCREENING OF PSYCHOSIS-RISK SYMPTOMS

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Background: Falsely observing symptoms of psychosis risk in youth is a critical limitation to pluripotent prevention efforts. Factors including race, age, and measurement construction may affect the validity of semi-structured interviews and self-report screening tools designed to identify symptoms. Consideration of different constructs measured within a single screening tool, what a screening tool can offer beyond prediction of psychosis-like symptoms, and how to maximize efficiency may all influence the ability to effectively identify people who would benefit from services.

Methods: Help-seeking adolescents (N=134) ages 12–25 completed various screening tools for psychosis risk, and the Structured Interview for Psychosis-risk Syndromes (SIPS). The influence of race and age on screen