78. FORNIX AND MAMMILLARY BODY VOLUMES IN INDIVIDUALS WITH SCHIZOPHRENIA

M.A. Cirillo (1,2), L.J. Seidman (1,2), N. Makris (2,3), J.M. Goldstein (1,2), D. Kennedy (2,3), V.S. Caviness (2,3), S.V. Faraone (1,2), M.T. Tsuang (1,2)

(1) Massachusetts Mental Health Center, (2) Harvard Medical School, and (3) Massachusetts General Hospital Center for Morphometric Analysis, Boston, MA USA

Bilateral volume reductions in the hippocampus and declarative memory impairment are both consistent findings among individuals with schizophrenia. The hippocampus and its primary inputs are involved in declarative memory formation. There is also evidence, though less conclusive, that the hippocampal efferent pathway in a primary synaptic target, i.e., the fornix and the mammillary bodies, play a role in learning and memory. Thus, memory deficits and associated abnormalities in various components of the medial temporal lobe system may be key characteristics of schizophrenia. MRI studies have examined hippocampal and parahippocampal volumes, but not the volumes of the fornix and the mammillary bodies in schizophrenics. Subjects included 44 individuals with DSM-IV schizophrenia and 44 normal controls for the volumetric analysis of the fornix. For a subset of the sample (20 patients and 26 normal controls), for whom the structures were clearly measurable, analysis of the mammillary bodies was also completed. Sixty contiguous 3 millimeter coronal slices were acquired on a 1.5 Tesla magnet. A new method was utilized to measure the width of the fornix and estimate the area of the mammillary bodies. Findings showed no differences in either of these measures of the fornix or mammillary bodies between schizophrenics and normal controls. We have found hippocampal and parahippocampal volume reductions in these individuals with schizophrenia (see Seidman et al., this issue). Thus, it appears that abnormalities are limited to those components of the "medial temporal lobe memory system." Additional analyses will correlate brain volume and memory performance in these patients.

79. SUBCORTICAL BRAIN ABNORMALITIES IN PATIENTS WITH SCHIZOPHRENIA: AN MRI MORPHOMETRIC STUDY

L.J. Seidman (1,3), J.M. Goldstein (1,3), N. Makris (2,3), D. Kennedy (2,3), W.S. Kremen (4), R. Toomey (1,3), V.S. Caviness (2,3), S.V. Faraone (1,3), M.T. Tsuang (1,3)

(1) Harvard Institute of Psychiatric Epidemiology and Genetics, (2) Massachusetts General Hospital Center for Morphometric Analysis and (3) Harvard Medical School, Boston, MA, USA, and (4) University of California, Davis, Sacramento CA. USA

Growing evidence indicates that patients with schizophrenia have subtle brain abnormalities in limbic, paralimbic and cortical regions. In this study we present a systematic morphometric analysis of the brain, including analyses of the cerebellum, brainstem, ventricles, basal ganglia, hippocampus-amygdala complex, and thalamus, to test the hypothesis that patients with schizophrenia have subcortical brain abnormalities. Subjects were 40 patients with DSM-IV schizophrenia and 48 healthy comparison subjects. Groups were comparable on age, sex, parental SES and ethnicity, and were comparable on demographic variables within sex-matched subgroups. Sixty contiguous 3 millimeter coronal, T1-weighted 3D magnetic resonance images (MRI) of the entire brain were acquired on a 1.5 Tesla magnet. Cortical and subcortical gray and white matter, and CSF, were segmented using a semi-automated intensity contour mapping algorithm, which included a new parcellation of the hippocampus from the amygdala. Analyses of covariance of the volumes of brain regions, adjusted for age and sex corrected brain volumes were used to compare patients and controls. Findings showed that the patients had significantly smaller volumes in the left hippocampus, and in the cerebellum, and had significantly larger volumes in other subcortical structures including the lateral and third ventricles, and basal ganglia structures (pallidum and putamen). These data are consistent with other studies of patients with schizophrenia, demonstrating a range of subcortical brain abnormalities, but extend these findings by showing the abnormalities within the same sample. Future research will assess the relationship between subcortical and cortical abnormalities in schizophrenia.

80. DOES RESPONSE MODE AFFECT DETECTION OF P300 ASYMMETRY IN SCHIZOPHRENIA?

D.F. Salisbury (1,2), Bret Rutherford (1), M.E. Shenton (1,2), R.W. McCarley (1,2)

Department of Psychiatry, Harvard Medical School at (1) McLean Hospital, Belmont, MA, 02478, USA; and (2) Brockton Veterans Affairs Medical Center, Brockton, MA, 02021, USA

P300 has been reported to show left-lateralized reductions in schizophrenia. This asymmetry has not been found by all, leading to debate in the literature about its presence. Most studies finding a P300 asymmetry used silent counts, whereas most that did not used button presses, suggesting that response mode may be a salient difference. This study examined the contamination of P300 by movement-related potentials. P300 was recorded when subjects pressed a button to target tones (15% of trials, 1.5 kHz) among standard tones (1.0 kHz), silently counted target tones, and pressed a button to 100% 1.5 kHz tones. To correct for motor contamination, reaction time-matched waveforms from the 100% target paradigm were subtracted from the button press task. Button-pressing altered P300 topography over contralateral frontal sites relative to silent counting. The correction procedure restored the normal topography. A simulation comparing data from schizophrenia subjects and the button-press and corrected data of normal subjects was performed. When P300 from the schizophrenia group was compared to the controls P300 on the button-press task, a group asymmetry interaction at T3 and T4 did not attain significance. By contrast, the corrected P300 data did show a significant group reversal of asymmetry. A small diminution of the normal left greater than right P300 asymmetry by button-pressing may be sufficiently large to interfere with the detection of a group reversal of P300 lateral temporal asymmetry. Studies that compare P300 topographies over temporal scalp areas must account for contamination of P300 by button-pressing.