Neuroanatomy in Bipolar Disorder Correlates with Behaviors

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A study of adults from families with heavy genetic loading for bipolar disorder suggests that the disease has both neurodevelopmental and neurodegenerative underpinnings.


The pathophysiology of bipolar disorder suggests that both neurodevelopmental and neurodegenerative processes contribute to the disease. These authors investigated multi-generational families genetically enriched for bipolar disorder to characterize neurobehavioral correlates of neuroanatomical measures implicated in the disease. The study included 527 adults, 153 with bipolar disorder and 374 without, from 26 families with heavy genetic loading for bipolar disorder. The authors collected structural neuroimages and multi-dimensional assessments of temperament and neurocognition from the subjects. They found that total cortical and ventricular volume had the greatest number of significant behavioral associations, including correlations with measures from multiple cognitive domains, particularly declarative and working memory and executive function. In contrast, cortical thickness was more specifically associated with declarative memory, letter fluency and processing speed tasks. Increased cortical thickness in ventrolateral prefrontal and parietal cortical regions was associated with better declarative memory only in the bipolar disorder patients. The findings indicate that neuroanatomical traits potentially affected by bipolar disorder are significantly associated with multiple neurobehavioral domains.


MRI-based markers of schizophrenia can separate patients from healthy controls, but it is unknown whether these markers can reliably distinguish schizophrenia from mood disorders, such as bipolar disorder. These authors used a structural MRI-based classification to identify a differential diagnostic signature separating 158 patients with first-episode and recurrent stages of schizophrenia from 104 patients with major depression. Then they used the same MRI signature to test its generalizability to 35 bipolar disorder patients, 23 first-episode psychosis patients, and 89 patients clinically defined at-risk mental states for psychosis. Neuroanatomical diagnosis was correct in 80% of patients with major depression and 72% with schizophrenia. A pattern of prefronto-temporo-limbic volume reductions and premotor, somatosensory and subcortical increments was noted in schizophrenia. The biomarker assigned 74% of the bipolar patients to the major depression group, while 83% of the first-episode psychosis patients and 77% with an ultra-high risk and 61% of those with a low-risk were labelled with schizophrenia. The authors suggest that neuroanatomical information may provide generalizable diagnostic tools that distinguish schizophrenia from mood disorders early on in the course of psychosis.