Effects Of Lithium On Gray Matter Volume And Cortical Thickness In Patients With Psychotic Disorders

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Introduction

MRI studies show that lithium may be associated with increased volume and cortical density of gray matter in bipolar disorder patients. However, the question whether this observation applies to psychotic disorders generally remains unclear. This study compares MRI findings of patients with psychotic disorders treated with lithium vs those not taking lithium.

Methods

285 individuals with schizophrenia (SZ), schizoaffective disorder (SZA), or psychotic bipolar disorder I (BPP) and 210 healthy controls (HC) enrolled in the B-SNIP study were studied. 51 patients (10 SZ, 8 SZA, 33 BPP) were being treated with lithium and 234 (105 SZ, 48 SZA, 81 BPP) were not taking lithium.

Diagnostic groups were assessed using the SCID. Cortical and subcortical gray matter region volumes and cortical thickness were obtained from 3T structural MRI using FreeSurfer software. ANCOVAs were used to examine differences between groups, controlling for antipsychotic use, age, socioeconomic status, site, and intracranial volume followed by Hochberg corrections for multiple comparisons.

Results

Compared to patients not taking lithium, lithium-treated patients had significantly increased gray matter volume in the left rostral anterior cingulate region. They also had significantly increased cortical density in bilateral superior parietal, the right superior frontal, inferior parietal, supramarginal and precuneus and the left paracentral, postcentral and precentral regions. Lithium-treated patients did not differ from controls.

Conclusions

Gray matter volume and cortical density were significantly increased in various brain regions in lithium-treated psychotic patients compared with patients not on lithium. We did observe significant diagnosis by group interaction. When examining the effects of lithium within each diagnosis, there were no significant findings, even though the mean values of volume and cortical density were higher for patients on lithium. Our results demonstrate that lithium’s effect on brain structure spans across all psychotic disorders, but the effects may be too small to be observed when the sample is segmented by diagnosis.