Article: EPA-1460
Topic: EPW40 - Bipolar Disorders 2

GRIN2B GENE AND ASSOCIATED BRAIN CORTICAL WHITE MATTER CHANGES IN BIPOLAR DISORDER

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Abnormalities in glutamate signaling and glutamate toxicity are thought to be important in the pathophysiology of bipolar disorder (BD). Whilst previous studies have found brain white matter changes in BD, there is paucity of data about how glutamatergic genes affect brain white matter integrity in BD. Based on extant neuroimaging data, we hypothesized that GRIN2B risk allele is associated with reductions of brain white matter integrity in the frontal, parietal, temporal, occipital regions and cingulate gyrus in BD. Fourteen patients with BD and 22 age, gender, handedness matched healthy controls were genotyped using blood samples and underwent diffusion tensor imaging. Compared to G allele, brain FA values were significantly lower in BD patients with risk T allele in left frontal region ($p = 0.001$), right frontal region ($p = 0.002$), left parietal region ($p = 0.001$), left occipital region ($p = 0.001$), right occipital region ($p < 0.001$), left cingulate gyrus ($p = 0.001$). Further elucidation of the interactions between different glutamate genes and their relationships with such structural, functional brain substrates will enhance our understanding of the link between dysregulated glutamatergic neurotransmission and neuroimaging endophenotypes in BD.

https://doi.org/10.1016/S0924-9338(14)78653-5 Published online by Cambridge University Press