

Brain-derived neurotrophic factor as a biomarker of acute episodes in bipolar disorder: meta-regression analysis

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Brain-derived neurotrophic factor (BDNF) plays a central role in synaptic plasticity and neurogenesis. Bipolar disorder (BD) is among the most disabling of all psychiatric disorders and is associated with poor outcomes. Some studies suggest that BDNF levels decrease during mood states and remain normal during euthymia, but other studies have contradicted this paradigm. Therefore, the aim of this study was to perform a meta-analysis of all studies that measured peripheral BDNF levels in adults with BD. We conducted a systematic review using electronic databases. Inclusion criteria were studies that measured BDNF in plasma or serum in vivo in adult patients with BD. The resulting studies were compiled to measure the effect sizes (ESs) of the differences in BDNF levels between BD patients in different mood states and controls. Thirteen studies were included with a total of 1113 subjects. The BDNF levels were decreased in both mania and depression when compared to controls (ES -0.81, 95% CI -1.11 to -0.52, $p < 0.0001$ and ES -0.97, 95% CI -1.79 to -0.51, $p = 0.02$, respectively). The BDNF levels were not different in euthymia when compared to controls (ES -0.20, 95% CI -0.61 to 0.21, $p = 0.33$). Meta-regression analyses in euthymia showed that age ($p < 0.0001$) and length of illness ($p = 0.04$) influenced the variation in ES. There was also an increase in BDNF levels following the treatment for acute mania (ES -0.63, 95% CI -1.11 to -0.15, $p = 0.01$). In conclusion, BDNF levels are consistently reduced during manic and depressive episodes and recover after treatment for acute mania. In euthymia, BDNF decreases with age and length of illness. These data suggest that peripheral BDNF could be used as a biomarker of mood states and disease progression for BD.

Biography

Dr. Brisa S. Fernandes has completed his M.D. at the age of 23 years from Federal University of Health Sciences of Porto Alegre, Brazil. She is a psychiatrist and currently a full time researcher as a doctoral student at the Laboratory of Calcium Binding Proteins in the Central Nervous System and Department of Biochemistry, Federal University of Rio Grande do Sul (UFRGS). She has published 20 papers in reputed journals and received nine research awards or honors, including the Samuel Gershon Award for Junior Investigators (SGAJI) from the International Society for Bipolar Disorders (ISBD) in 2010. Her main focus of research is biomarkers in psychiatric diseases, particularly bipolar disorder and schizophrenia, and its pathological and clinical implications.