Event related potentials in bipolar disorder with co morbid anxiety disorder

Thesis
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Abstract:

Objective: This study measures the suppression in P50, N100, and P200 waves in auditory evoked potential for bipolar disorder patients with and without comorbid anxiety disorder, and finding a correlation with impulsivity.

Method:3 groups were compared in the study: 30 bipolar disorder patients, 30 bipolar disorder patients with comorbid anxiety disorder, and 30 healthy subjects as control.Auditory evoked potential was tested using the paired click paradigm; also an impulsivity score was done after full psychiatric examination.

Results:Bipolar disorder patients showed higher suppression in P50, N100, and P200 waves than bipolar disorder patients with comorbid anxiety; which is also higher than controls, and impulsivity scores were higher in bipolar disorder patients with comorbid anxiety.

Conclusion: auditory evoked potential may work as an indicative tool for measuring the severity of bipolar disorder and that anxiety disorders increase impulsivity in bipolar disorder patients.

Key Words

Bipolar disorder, Anxiety disorder comorbidity, Auditory evoked potential, Impulsivity, P50, N100, P200, sensory gating, attention.

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Introduction

In a recent large-scale investigation, more than half (51.2%) of patients with bipolar disorder (BD) were identified as having a co-occurring anxiety disorder at some point in their lifetime, while 30.5% were diagnosed as having a current anxiety disorder (***Simon et al., 2004***).

Anxiety disorder co morbidity in BD is associated with a number of negative sequels, including greater bipolar severity, reduced duration of euthymic episodes, elevated substance abuse, greater functional impairment, and an overall diminished quality of life (***Young et al., 1993; Cassano et al., 1999; Simon et al., 2004).***

Measuring event related potentials (ERPs) provides a valuable tool for assessing dynamic brain processes it is noninvasive and allows an exquisite temporal observation of brain signaling and cognition. In addition, the ERP is highly sensitive to sensory, cognitive, and motor aspects of information processing in the brain, and it has been shown to be of great value in studying the genetics psychiatric disorders (***Porjesz et al., 2005).***

The P50 event related potential is associated with preattentional sensory processing, and is presumed to be related to filtering of irrelevant stimuli potentially protecting higher-order functions from being overloaded (***Swann, 2010***).

Impairment in P50 gating was found regardless of treatment with antidepressants or mood stabilizers ***(Olincy and Martin, 2005***).

P50, N100 and P200 gating were impaired in subjects with bipolar disorder whether or not there was a history of psychosis, though impairment was greater in subjects with than subjects without such a history (***Olincy and Martin. 2005***).

The paired-click paradigm is used to assess neuronal reactivity to redundant stimuli: a first auditory stimulus (S1) elicits a positive component at the vertex (Cz) peaking between 40 and 80 ms (P50 wave), and is attenuated in response to a second identical auditory stimulus (S2) presented within 500 ms following S1 (***Zouridakis, and Boutros. 1992,Dolu et al., 2001***).

The strength of gating is expressed either as the ratio between the P50 amplitude evoked by S2 divided by the amplitude evoked by S1 or as the absolute difference in amplitude between S1 and S2. A higher ratio and lower difference score are interpreted as weaker gating (***Lijfijt et al., 2009).***

Aim of work

- To study auditory evoked potential (P50, N100 and P200 latencies) in Bipolar disorder patients comparing it to bipolar disorder patients with comorbid anxiety disorder and controls.

- To study the correlation between P50, N100, and P200 latencies and the severity of impulsivity, the current episode, treatment with ECT, No. of manic episodes, the presence of psychotic features and the family history of psychosis, mood disorders and anxiety disorders.

- To study wither the comorbid anxiety disorder increase impulsivity or not in bipolar disorder patients.

Introduction on Bipolar Disorder.

Bipolar disorder (BPD) is a common and serious mental disorder characterized by severe mood symptoms, including episodes of mania or hypomania and depression, occurring with a typically cyclical course ***(Kessler et al., 2005).***

Epidemiology:

Bipolar illness contributes to a prevalence of 2.4% of all bipolar spectrum disorders worldwide according to a study based on more than 60 000 subjects in 11 countries (***Merikangas et al., 2011***). Furthermore most recent prospective studies of adolescents estimate bipolar II prevalence rates at 3–4% (***Merikangas and Lamers, 2012).*** Males and females are approximately equally at risk, and the mean age of onset is 18 years for bipolar I, and 20 years for bipolar II (***Merikangas et al., 2007***).

Bipolar disorder is still associated with a marked premature mortality, with mortality rate 2–3 times higher compared to the general population (***Muller-Oerlinghausen et al., 2002***). This increased and untimely lethality in bipolar disorder patients is in part due to accidents, medical illness and substance abuse, but the greatest part of excess lethality in bipolar patients results from suicide (***Sher et al., 2006).***

The personal and societal costs of BPD are enormous: even among adequately-treated individuals, relapse is common and the disorder can be profoundly disabling, resulting in serious economic burden ***(Kessler et al., 2006***) and a lifetime risk of suicide as high as 20% (***Goldberg and Harrow, 2004***).