BIPOLAR DISORDERS Factsheet

December 2021

What is the P300?

The P300 wave is an event-related potential, measured using EEG. It is a spike in brain activity approximately 300ms after presentation of a target stimulus, which is usually auditory but can also be visual. A typical auditory paradigm uses a series of tones where 20% of them are infrequent targets called “oddballs”. Research subjects are asked to respond to these oddballs, and the related spike in brain activity is usually apparent in frontal regions thought to be related to contextual updating and memory storage. This is called a P3b response, while a P3a response reflects response to an infrequent non-target stimulus usually apparent in parietal regions and thought to be related to automatic attention processing. P300 measures also include amplitude and latency of the P300 wave. Amplitude is proportional to the amount of attentional resource devoted to the task and the degree of information processing required, while latency is considered a measure of stimulus classification speed.

What is the evidence for P300 anomalies in people with bipolar disorder?

Moderate to high quality evidence shows medium to large effects of reduced P300 P3b (target) amplitude and longer P300 P3b (target) latency in people with bipolar disorder compared to controls in both auditory and visual paradigms. There was also a small effect of reduced P300 P3a (non-target) amplitude in an auditory paradigm. These results remained in studies of people with or without a history of psychotic symptoms, in people with different bipolar types (bipolar I vs. bipolar II), and in people in different phases of the disorder (depression, euthymia, mania).

Compared to people with unipolar depression, there was a medium-sized effect of longer latency in people with bipolar depression, with no differences in amplitude. Results were similar in the analyses of remitted patients. The results were larger in studies conducted in China, in studies with >100 patients, and in unmedicated patients.

For more information see the technical table

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NeuRA (Neuroscience Research Australia) is one of the largest independent medical and clinical research institutes in Australia and an international leader in neurological research.

Diseases of the brain and nervous system pose the greatest health, economic and social burden of any disease group because they are chronic, debilitating and have no known cures.

Medical research is the cornerstone of efforts to advance the health and wellbeing of families and the community. Our dedicated scientists are focussed on transforming their research into significant and practical benefits for all patients.

While we hope you find this information useful, it is always important to discuss any questions about bipolar disorder or its treatment with your doctor or other health care provider.

HOW YOUR SUPPORT HELPS

We are able to make significant advances due to the generosity of countless people. Your donation allows us to continue to work towards transforming lives. For information on how you can support our research, phone **1300 888 019** or make a secure donation at **neura.edu.au**.

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