

POST-TRAUMATIC STRESS DISORDER Factsheet

August 2021

What is EEG?

Electroencephalography (EEG) uses electrodes on the scalp to measure electrical activity from the brain. Quantitative spectral EEG investigates several waveforms, and so the activity can be measured, but EEG also gives rise to event related potentials (ERP), which measure the EEG activity directly evoked by a stimulus, often using cognitive or perceptual stimuli. P300, also referred to as P3, may be the ERP most suitable for the assessment of PTSD, given that it is well documented, and, with the appropriate stimulus paradigm used, can convey information about attention and working memory processes.

P300 refers to a spike in activity approximately 300ms following presentation of a target stimulus, which is alternated with standard stimuli to create an 'oddball' paradigm, which is most commonly auditory. In this paradigm, the subject must respond only to the infrequent target stimulus rather than the frequent standard stimulus. The amplitude of the P300 response is proportional to the amount of attentional resource devoted to the task and the degree of information processing required, while the latency is considered a measure of stimulus classification speed, unrelated to behavioural response time

What is the evidence for changes in EEG readings in people with PTSD?

Moderate quality evidence found large increases in P3a (involuntary attention) amplitude with trauma-related distractors in people with PTSD compared to people without PTSD but with trauma exposure. Medium-sized effects showed P3b (voluntary attention) amplitude was also increased with trauma-related distractors in frontal and central regions, but not in parietal regions, in people with PTSD compared to people without PTSD but with trauma exposure.

There were medium-sized reductions in P3b amplitude with neutral distractors in people with PTSD compared to healthy controls, and there were small reductions in P3wm (working memory) amplitude with neutral distractors in parietal, but not in frontal and central regions of people with PTSD compared to healthy controls.

For more information see the technical table

HOW YOUR SUPPORT HELPS

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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 PTSD and its treatment with your doctor or other health care provider.