Posttraumatic stress disorder treatment: Genetic predictor of response to exposure therapy

June 11 2013

There is growing evidence that a gene variant that reduces the plasticity of the nervous system also modulates responses to treatments for mood and anxiety disorders. In this case, patients with posttraumatic stress disorder, or PTSD, with a less functional variant of the gene coding for brain-derived neurotrophic factor (BDNF), responded less well to exposure therapy.

This gene has been implicated previously in treatment response. Basic science studies have convincingly shown that BDNF levels are an important modifier of the therapeutic effects of antidepressants in animal models. Other researchers have made similar findings in a small group of depressed patients treated with the rapid-acting antidepressant ketamine. Low BDNF plasma levels also have been linked to poorer effects of cognitive rehabilitation in schizophrenia. BDNF infused directly into the infralimbic prefrontal cortex in rats was found to extinguish conditioned fear, and BDNF levels were found to modulate the amount of fear extinction.

"Findings are accumulating to suggest that BDNF is an important modifier of the responses to a number of clinical interventions, presumably because BDNF is such an important regulator of neuroplasticity, i.e., the ability of the brain to adapt," said Dr. John Krystal, Editor of Biological Psychiatry.

In this study, researchers from Australia and Puerto Rico teamed up to investigate the influence of the BDNF Val66Met genotype on response to exposure therapy in patients with PTSD. They recruited 55 patients, all of whom participated in an 8-week exposure-based cognitive behavior therapy program.

Exposure therapy is currently the most effective treatment for PTSD, although it does not work for everyone. This type of therapy is delivered over multiple one-on-one sessions with a trained therapist, with a goal of reducing patients' fear and anxiety.

They found that patients with the Met-66 allele of BDNF, compared with patients with the Val/Val allele, showed poorer response to exposure therapy.

"This paper reflects an important and significant advance, in translating recent ground-breaking findings in animal and human neuroscience into clinically anxious populations," said first author Dr. Kim Felmingham.

She added, "Findings from this study support a widely held, but largely untested, hypothesis that extinction is necessary for exposure therapy. It also provides evidence that genotypes influence response to cognitive behavior therapy."

This finding supports prior evidence and highlights the importance of considering genotypes as potential predictor variables in clinical trials of exposure therapy.

More information: "The Brain-Derived Neurotrophic Factor Val66Met Polymorphism Predicts Response to Exposure Therapy in Posttraumatic Stress Disorder" by Kim L. Felmingham, Carol Dobson-Stone, Peter R. Schofield, Gregory J. Quirk, and Richard A. Bryant (doi: 10.1016/j.biopsych.2012.10.033). The article appears in *Biological*

Psychiatry, Volume 73, Issue 11 (June 1, 2013)