Even When Anorexia is Contained, Brain Repair Lags Behind

By Erik Lief — March 1, 2017

While small in scope, a recent study relating to anorexia nervosa supports one of the primary post-treatment concerns facing patients suffering from the eating disorder: the chances of relapse are high.

That's because the dangerous, even potentially-fatal disorder prompts physical changes in the brain, and these researchers report that even after "successful" treatment the brain has not reverted back to its healthy state. Specifically, the organ continues to have an "elevated reward system" as compared to normal brains.

The presence of this condition means "they are not cured," states Guido Frank, MD, the study's senior author and associate professor of psychiatry and neuroscience at the University of Colorado School of Medicine, according to a statement from the institution. "This disease fundamentally changes the brain response to stimuli in our environment. The brain has to normalize and that takes time."

Research by Dr. Frank and his team supports the accepted principles in treating eating disorders, in that a patient is never really "cured" and he/she, along with loved ones, must remain vigilant to recognize any signs that a relapse may be occurring.

While for a small percentage of patients significant recovery can take hold relatively quickly, for the overwhelming majority of sufferers "treatment and the recovery process take three to seven years, and in some cases even longer," according to ANRED, an organization dedicated to anorexia.
nervosa & related eating disorders. "Recovery takes however long it takes. For most people, changing entrenched food behaviors and resolving the issues that underlie them is a formidable challenge."

The study, recently published in the *American Journal of Psychiatry* [3], compared the brain structure of 21 females between the ages of 15 and 16 before and after treatment for anorexia to 21 subjects not stricken by the disorder.

FIGURE 1. Reward Circuit Regions of Interest in a Study of Reward Prediction Error Response With Weight Gain in Adolescent Anorexia Nervosa

nervosa patients have implicated central reward circuits that govern appetite and food intake in the disease," said the statement. "This study showed that the reward system was elevated when the patients were underweight and remained so once weight was restored." In addition, dopamine, a neurotransmitter, "mediates reward learning and is suspected of playing a major role in the pathology of anorexia nervosa."

More research is needed in this area, but even this small study sheds light on a condition that is terribly difficult to treat. If you suspect anorexia nervosa poses a threat to yourself or someone you know, here's some overview information from the Mayo Clinic [4].

But this study of brain activity does open the door on this disorder just a bit further, in that it
"suggests that reward learning in general, and independently of primary taste reward, is important for our overall understanding of the neurobiology of adolescent anorexia nervosa," writes the authors of the study. (Brain scan image courtesy of the study, titled Association of Elevated Reward Prediction Error Response With Weight Gain in Adolescent Anorexia Nervosa.)

"Generalized sensitization of brain reward responsiveness could be a result of food restriction and may last long into recovery, consistent with basic research ... Whether individuals with anorexia nervosa have a genetic predisposition for such a sensitization requires further study."

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