

Brain circuit abnormalities may underlie bulimia nervosa in women

January 5 2009

Women with bulimia nervosa appear to respond more impulsively during psychological testing than those without eating disorders, and brain scans show differences in areas responsible for regulating behavior, according to a report in the January issue of *Archives of General Psychiatry*, one of the *JAMA/Archives* journals.

Bulimia nervosa often begins in the adolescent or young adult years, according to background information in the article. "Primarily affecting girls and women, it is characterized by recurrent episodes of binge eating followed by self-induced vomiting or another compensatory behavior to avoid weight gain," the authors write. "These episodes of binge eating are associated with a severe sense of loss of control."

Certain pathways between nerve cells known as frontostriatal circuits help individuals control their own voluntary behaviors, the authors note. These functions are tested during the performance of the Simon Spatial Incompatibility task, in which participants must indicate the direction an arrow is pointing regardless of where it appears on a screen. The task is easier when the arrow direction matches the side of the screen, but more difficult when, for instance, an arrow that points leftward appears on the right side of the screen. Ignoring the side of the screen to focus on the arrow direction requires regulating behavior by fighting the tendency to respond automatically and resolving conflicting messages.

Rachel Marsh, Ph.D., and colleagues at Columbia University and the New York State Psychiatric Institute, New York, compared the

performance on the task of 20 women with bulimia nervosa with that of 20 healthy women who served as controls. Participants performed the task while undergoing functional magnetic resonance imaging (fMRI).

"Patients with bulimia nervosa exhibited greater impulsivity than did control participants, responding faster and making more errors on conflict trials [where the arrow direction and location did not match] that required self-regulatory control to respond correctly," the authors write. "They responded faster on congruent trials following incorrect conflict trials, suggesting impulsive responding even immediately after having committed an error." When patients with bulimia did respond correctly on trials in which the arrow side and direction did not match, their frontostriatal circuits did not activate to the same degree as did those of women in the control group.

"These group differences in performance and patterns of brain activity suggest that individuals with bulimia nervosa do not activate frontostriatal circuits appropriately, perhaps contributing to impulsive responses to conflict stimuli that normally require both frontostriatal activation and the exercise of self-regulatory control to generate a correct response," the authors conclude. "We speculate that this inability to engage frontostriatal systems also contributes to their inability to regulate binge-type eating and other impulsive behaviors."

To expand on this hypothesis, future studies should also include impulsive individuals who have healthy weights and eating behaviors, adolescents close to the time that bulimia nervosa develops and patients with varying severity of symptoms, they note.

Paper: Arch Gen Psychiatry. 2009;66[1]:51-63.

Source: JAMA and Archives Journals

Citation: Brain circuit abnormalities may underlie bulimia nervosa in women (2009, January 5)
retrieved 19 April 2024 from

<https://medicalxpress.com/news/2009-01-brain-circuit-abnormalities-underlie-bulimia.html>

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