Association Between Attention-Deficit/Hyperactivity Disorder and Bulimia Nervosa: Analysis of 4 Case-Control Studies

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Background: Impulsivity is a common feature of attention-deficit/hyperactivity disorder (ADHD), and evidence suggests that impulsivity traits may be an indicator of poor prognosis for individuals with bulimia nervosa. To identify whether there is an association between ADHD and bulimia nervosa, the authors systematically examined data from children and adults with and without ADHD.

Method: We systematically identified rates of bulimia nervosa in individuals with and without ADHD (DSM-III-R criteria) in our 2 large pediatric and 2 large adult samples (N = 522 children, 742 adults). Subjects were assessed from the late 1980s to February 1999.

Results: In the 2 samples of adults with and without ADHD, significantly greater rates of bulimia nervosa were identified in women with versus without ADHD (12% vs. 3%, $p < .05$ for 1 sample and 11% vs. 1%, $p < .05$ for the other sample). No significant differences in rates of bulimia nervosa were identified in men or children with ADHD when compared to sex-matched control subjects.

Conclusion: Although preliminary and requiring further confirmation, these findings suggest that ADHD may be associated with bulimia nervosa in some women. If confirmed, this association between bulimia nervosa and ADHD could have important clinical and therapeutic implications.

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Bulimia nervosa is a serious neuropsychiatric disorder estimated to affect 1% of young women and 0.1% of young men.[1] Its core features include binge eating and purging, behaviors that can be described as impulsive. Some studies suggest that measures of impulsivity may correlate with severity of bulimia nervosa.[2–4] Furthermore, some studies suggest that cluster B personality disorders, of which impulsivity can be a characteristic trait, may be prevalent in individuals with bulimia nervosa.[5,6] Individuals with such personality disorders may also experience bulimia nervosa outcomes.[7]

Because impulsivity is also one of the key features of attention-deficit/hyperactivity disorder (ADHD), and ADHD is a common pediatric and adult disorder estimated to afflict 5% to 10% of children[8] and 4% of adults,[9] it is possible that ADHD could occur comorbidly in patients suffering with bulimia nervosa. Although it is well documented that individuals with ADHD have a higher risk than individuals without ADHD of experiencing a wide range of psychiatric comorbidities, including mood, anxiety, and addictive disorders,[10] the comorbidity with bulimia nervosa has not been well studied.

There are scant reports in the medical literature of adults suffering from both ADHD-like symptoms and bulimia nervosa. Schweickert and colleagues[11] described a 25-year-old bulimic woman with ADHD symptoms. Sokol et al.[12] described a 20-year-old patient and a 38-year-old patient who both had bulimia nervosa, cluster B personality traits, and ADHD symptoms. Sokol et al.[12] also reported that a group of 6 women with bulimia nervosa and cluster B personality disorders endorsed more current traits on the Self-Report Modified Conners Rating Scale,[13] which can be used to identify ADHD, than 7 control subjects. The authors did not report whether any of these subjects met criteria for ADHD.[12] Drimmer[14] described a 31-year-old patient and a 42-year-old patient with diagnoses of bulimia nervosa and ADHD. Dukarm[15] reported that 5 female patients aged 15 to 24 years and 1 male patient aged 17 years had diagnoses of bulimia nervosa and inattentive type ADHD. Mattos et al.[16] identified one 18-year-old woman with comorbid diagnoses of bulimia nervosa and ADHD in a sample of 86 Brazilian adults with ADHD. To our knowledge, their study[16] is the only one that used a structured clinical interview to identify bulimia nervosa and ADHD. However, the proportion of women affected by bulimia nervosa in this sample cannot be calculated from this report because the number of women participating was not specified.

A better understanding of the putative association between ADHD and bulimia nervosa has important clinical implications. Considering that ADHD and bulimia nervosa respond to different pharmacologic and nonpharmacologic treatments, diagnosing ADHD in subjects with bulimia nervosa could lead to new therapeutic opportunities for this debilitating and life-threatening disorder.

The purpose of this study was to systematically evaluate the association between ADHD and bulimia nervosa. Because eating disorders were specifically evaluated in our pediatric and adult studies of ADHD,[10,17–19] we reviewed rates of bulimia nervosa in these 4 large samples of children and adults with and without ADHD. We hypothesized that an association between ADHD and bulimia nervosa would be identified.

METHOD

We reviewed lifetime rates of bulimia nervosa in 4 large data sets[10,17–19] previously described by our research group in which eating disorders were specifically assessed. Subjects were assessed from the late 1980s to February 1999. The pediatric studies[17,18] were 2 large and identically designed controlled family-genetics studies that assessed children aged 6 to 17 years with and without ADHD who were ascertained from pediatric and psychiatric sources. These studies included 140 boys with and 120 boys without ADHD[17] and 140 girls with and 122 girls without ADHD.[18] At the time of assessment, 28 (20%) of the girls with ADHD and 23 (26%) of the girls without ADHD were from 15 to 17 years old.[18] The adult studies[10,19] consisted of large samples of consecutively referred adults with ADHD and controls. The first study[19] assessed 101 adults with ADHD and 207 adults without ADHD, and the second study[10] assessed 219 adults with ADHD and 215 adults without ADHD. Adult control subjects for these studies were derived from the nonreferred adult parents of non-ADHD proband children participating in the family-genetics studies of ADHD referenced above.[17,18]

Table 1. Prevalence of Bulimia Nervosa in Subjects With and Without ADHD

Study Population	Subjects With Bulimia Nervosa, N (%)
Pediatric studies	
Biederman et al, 2002[22]	
Girls with ADHD (N = 140)	2 (1)
Girls without ADHD (N = 122)	0
Boys with ADHD (N = 140)	0
Boys without ADHD (N = 120)	0
Adult studies	
Biederman et al, 1994[19]	
Women with ADHD (N = 42)	5 (12)
Women without ADHD (N = 110)	3 (3)
Men with ADHD (N = 59)	2 (3)
Men without ADHD (N = 97)	0
Biederman et al, 2004[10]	
Women with ADHD (N = 82)	9 (11)
Women without ADHD (N = 81)	1 (1)
Men with ADHD (N = 137)	0
Men without ADHD (N = 134)	0

Abbreviation: ADHD = attention-deficit/hyperactivity disorder.

As described elsewhere,[10,17–19] psychiatric assessments were obtained by raters who were blind to the clinical diagnosis. All diagnostic assessments were made using DSM-III-R–based structured interviews. Assessments of children were made with the Schedule for Affective Disorders and Schizophrenia for School-Age Children-Epidemiologic Version (K-SADS-E).[20] Assessments of adults relied on the Structured Clinical Interview for DSM-III-R (SCID)[21] supplemented with modules from the K-SADS-E covering childhood diagnoses. Diagnoses of children were based on independent interviews with the mothers and direct interviews with the children if they were older than 12 years. A lifetime history of bulimia nervosa was established based on endorsement of DSM-III-R criteria for the condition during SCID or K-SADS-E interviews.

RESULTS

As seen in Table 1, within our 2 large pediatric samples, 1% of girls with ADHD and no girls without ADHD met diagnostic criteria for a history of bulimia nervosa. The ages at onset of bulimia nervosa for the 2 girls with ADHD and bulimia nervosa were 12 and 14 years, respectively.

No boys with or without ADHD had a bulimia nervosa diagnosis. In the adult samples, a significantly higher proportion of women with ADHD met diagnostic criteria for histories of bulimia nervosa, in comparison with rates of bulimia nervosa in sex-matched control subjects: (12% vs. 3%, $p < .05$ for one sample, and 11% vs. 1%, $p < .05$ for the other sample). In contrast, the rates of bulimia nervosa were negligible in men with and without ADHD (Table 1).

DISCUSSION

We identified significantly elevated rates of bulimia nervosa in 2 samples of women with ADHD relative to control samples. In contrast, the rates of bulimia nervosa in samples of girls and boys aged 6 to 17 years with and without ADHD and in samples of men with and without ADHD were negligible. Our findings suggest that there is an association between ADHD and bulimia nervosa in adult women. To our knowledge, this is the first evaluation of the comorbidity between ADHD and bulimia nervosa.

The rates of bulimia nervosa in our adult non-ADHD controls are consistent with the previously reported 1% to 3% prevalence rate of lifetime bulimia nervosa in women.[23,24] This suggests that the control groups in our study were adequate to correctly estimate the rate of bulimia nervosa in ADHD subjects. Mattos et al.[16] reported a lower rate of bulimia nervosa in Brazilian adults with ADHD than the rate we found in our adult studies. Comparison between their study and our report is limited because their study did not include a control group, and there may be different rates of bulimia nervosa in Brazilian and North American cultures.

Our results show that bulimia nervosa was selectively overrepresented in women with ADHD but not in girls with this disorder. This suggests that bulimia nervosa emerges in adulthood in women with ADHD. However, considering that bulimia nervosa commonly onsets in late adolescence,[25] our ability to fully assess bulimia nervosa in our sample was limited since only 20% of the ADHD girls and 26% of the control girls were 15 years or older. More work is needed to further evaluate the nature of this association, particularly whether ADHD serves as a moderating or mediating influence on bulimia nervosa when both conditions coexist.

Although the reasons for an overrepresentation of bulimia nervosa in women with ADHD remain unclear, several explanations are plausible. It is possible that a factor common to both ADHD and bulimia nervosa mediates the apparent association between the 2 conditions in our clinical samples of adult women. Common predisposing environmental or familial factors could contribute to the manifestation of both conditions in subjects with ADHD. For example, high rates of major depression and substance abuse have been described in studies of subjects with bulimia nervosa[6] and subjects with ADHD.[10]

If confirmed, an increased risk for bulimia nervosa in women with ADHD has important clinical and therapeutic implications. Since bulimia nervosa and ADHD require different pharmacologic and nonpharmacologic approaches, clinical evaluations of women with bulimia nervosa may benefit from systematic identification of ADHD and vice versa. In individuals with comorbid ADHD and bulimia nervosa, impulsivity traits characteristic of ADHD might contribute to the severity of eating disordered behavior. Eleven of the case reports documenting bulimia nervosa with comorbid ADHD traits that were revealed in our literature search describe reduction of bulimic behavior with stimulant treatment,[11,12,14,15] providing tentative support for the hypothesis that treatment of ADHD-related impulsivity could improve outcome in bulimic patients. Patients with bulimia nervosa who are not identified as having ADHD have also described improvement in bulimic symptoms with stimulant treatment.[26,27] Because of the preliminary nature of these reports, more studies are needed to confirm these findings and suggest therapeutic options for patients afflicted by both ADHD and bulimia nervosa.

There are a number of limitations to our report. Because our samples of pediatric and adult subjects with ADHD were referred, our findings may not generalize to community samples. In addition, it is possible that rates of bulimia nervosa are elevated in individuals with chronic illnesses in general, as suggested by findings in the Minnesota Adolescent Health Survey.[28] In this large study,[28] subjects who identified themselves as having "attention deficit disorder" or other chronic illnesses were more likely to binge, diet, or vomit than control subjects, but eating disorder diagnoses were not assessed.

Despite these considerations, our findings suggest that women with ADHD have an elevated risk of experiencing bulimia nervosa. If confirmed, this association may have important clinical implications for our understanding and treatment of both conditions.

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