Comorbid Eating Disorders and Posttraumatic Stress Disorder: Implications for Etiology and Treatment

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The comorbidity of eating disorders, particularly those characterized by binge eating and/or purging, and posttraumatic stress disorder (PTSD) has been fairly well established. This association has been more frequently investigated among women. However, a recent investigation in a U.S. nationally representative sample found that 39.81% of women and 66% of men with a lifetime diagnosis of bulimia nervosa (BN) also met criteria for lifetime PTSD. In this study, 26% of women and 24% of men with a lifetime diagnosis of binge eating disorder (BED) met criteria for a diagnosis of lifetime PTSD.

Childhood sexual abuse is also considered a nonspecific risk factor for eating disorders, meaning that it also precedes the onset of other disorders. More recent studies that have investigated multiple types of childhood and adult traumas have found consistent associations with eating disorders. In one of our earlier studies, we found that most women with lifetime anorexia nervosa (AN; 71%), BN (78%), and BED (63%) had been exposed to at least one form of interpersonal trauma, including physical or sexual assault, mugging, kidnapping, or witnessing familial violence.

Although men are understudied in eating disorders in general, as well as in investigations of comorbid PTSD and disordered eating, evidence suggests that men with eating disorders may have significant trauma histories as well. In Mitchell et al.’s 2012 study, all the men with lifetime histories of BN had experienced interpersonal trauma, as had 68% of men with AN, and 74% of men with BED.

The Connection between Trauma/PTSD and Disordered Eating
Several potential mechanisms link trauma/PTSD and disordered eating. Exposure to trauma is a criterion for the development of PTSD. Trauma also may play an etiologic role in the development of depression, eating disorders, substance use disorders, and borderline personality disorder. Stressful life events may also play a role in the development of eating disorders. In addition, PTSD and eating disorders may share biological vulnerabilities, including dysfunction in the hypothalamic-pituitary-adrenal (HPA) axis, which has been associated with chronic stress. Generally, exposure to trauma may contribute to global psychophysiological dysregulation, increasing risk for development of psychopathology. Binge eating and purging also may be used as forms of self-medication, enabling an individual to cope with symptoms of negative affect. The act of binge eating may produce a dissociative-like state of disinhibition, serving as a form of emotional numbing or avoidance. Of note, use of disordered eating to regulate negative affect may be particularly characteristic of individuals high in impulsivity, a trait that has been associated with PTSD as well as BN.
How Body Image Is Affected By Trauma
There also may be direct links between exposure to specific types of trauma and body image. Interpersonal trauma may negatively impact one’s body image, as demonstrated by findings that women with histories of sexual assault have more negative images of their physical selves than do women without sexual assault histories. Sexual abuse may lead women to develop more critical views of themselves, thus leading to body image disturbance. It has been hypothesized that some women with a history of sexual assault wish to be thinner in order to minimize their secondary sex characteristics and to appear less attractive to potential perpetrators. Conversely, although this has been less well studied, victims of sexual assault may engage in binge eating in order to gain weight and thus to appear less attractive or to look stronger, in an attempt to “arm” themselves against potential perpetrators.

Choosing the Best Treatment Approach
To date, no treatments have been developed specifically for clients with comorbid PTSD and eating disorders. However, because PTSD and eating disorders share many common biological and psychological features, it is possible that treatment for one disorder could result in improvement of symptoms for the other. Cognitive behavioral therapies (CBTs), including CBT-Enhanced for Eating Disorders (CBT-E) and Cognitive Processing Therapy for PTSD (CPT) are recommended for both disorders. CPT has two forms, one that involves a written trauma narrative plus cognitive therapy to challenge and address problematic cognitions about the trauma, one’s self, and the world, and a second form, CPT-C, that uses cognitive therapy without the written trauma account. Both are effective treatments for PTSD.

Clinicians treating patients with these comorbid disorders often must determine which disorder to treat first, or whether to blend treatment approaches and to address both disorders at the same time. The specific approach selected depends in part on the severity of the eating disorder symptoms, which have the potential to be dangerous and even life-threatening. In less-urgent situations, case conceptualization, in addition to the patient’s preference, may guide the choice to treat one disorder before the other.

Case formulation may be an especially useful tool for describing interrelationships among PTSD and eating disorder symptoms and associated variables. Essentially, the patient and clinician diagram the patient’s symptoms as well as contributing factors, to determine the mechanisms that link them. In some, perhaps milder, cases of comorbid disordered eating and PTSD, the eating disorder symptoms may have developed solely as a maladaptive coping mechanism. In this case, treating the PTSD first, while continuing to monitor eating disorder symptoms, could result in remission of the disordered eating symptoms. In addition, CPT involves 12 treatment sessions, and PTSD symptoms may remit quickly.

Sometimes Referral Is Needed
Some of the cognitive exercises in CPT could focus on the impact of the trauma on the patient’s eating disorder symptoms. However, clinicians without specific PTSD expertise may need to refer patients to another professional. In a recent study of women presenting for PTSD treatment, we found that although symptoms common to both PTSD and disordered eating, including impulse regulation, interoceptive awareness, interpersonal distrust, and ineffectiveness, improved following CPT, there were no changes in drive for thinness or bulimia symptoms. Thus, symptoms specific to eating disorders may require additional treatment following standard therapy for PTSD.

For patients with more severe eating disorder symptoms that could interfere with PTSD treatment, the eating disorder may need to be treated first. Specifically, nutritional rehabilitation may be necessary so that the patient can engage in psychotherapy. In addition, it may be possible to treat symptoms of both disorders using a blended approach. However, future research is needed to determine whether there is greater benefit to a sequential vs. simultaneous approach to treating comorbid eating disorders and PTSD.
**Future Research**

Eating disorders have high rates of comorbidity with other disorders, including PTSD. To date, there are no established treatments for eating disorders and comorbid PTSD. Both PTSD and eating disorders can be extremely debilitating on their own. It is recommended that clinicians conduct thorough psychiatric evaluations, including assessment for trauma histories for patients with eating disorders, and to attempt to determine what, if any, role trauma may have played in the onset of the patient’s eating disorder. Severity of symptoms and case conceptualization may guide the choice to choose to treat either the PTSD or eating disorder first or whether to treat them simultaneously. Future research is needed to determine the best treatment options for eating disorders with comorbid PTSD and whether a sequential or simultaneous approach offers the greatest benefit.

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**UPDATE: A Promising Intervention for Binge Eating**

*An anticonvulsant used for migraine deserves careful monitoring.*

An intervention using dialectical behavior therapy (DBT) to treat binge eating among female adolescents and young adults has shown promising results and also was well received by the participants in a recent study. As reported at the International Conference on Eating Disorders in Boston, 58 teens and young women 13 to 22 years of age were randomized into a DBT-based intervention group (LIBER8; n=34) or to a control group offering weight management (n=24). All participants completed three assessments of their eating behaviors: once at baseline, then immediately after the intervention, and again at a 3-month follow-up. Participants and therapists also completed “session satisfaction” and "therapist feasibility" surveys after each session. As Suzanne Mazzeo, PhD, FAED, of Virginia Commonwealth University, Richmond, and her colleagues reported, 99% of the LIBER8 group and 84% of the weight management group were comfortable with their group leaders and other participants, and 81% were very satisfied with the sessions overall. Significant reductions in objective and subjective binge episodes were noted in both groups. However, according to the authors, the DBT intervention led to greater satisfaction among the participants and more marked reductions in loss-of-control eating episodes.

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**Stepping on the Scale: Not Such a Simple Process**

*Identifying and overcoming resistance from patient and therapist alike.*

Two British psychologists present an intriguing analysis of a seemingly simple and routine step in treatment that is actually very complex: weighing patients. Drs. Glenn Waller and Victoria A. Mountford of the University of Sheffield, Sheffield, UK, and King’s College, London, focused on current protocols for
weighing patients during cognitive behavioral therapy, or CBT (Behaviour Research and Therapy 70 (2015), 1-10).

A starting point for their research was the marked variability in evidence-based therapies, particularly statistics showing that fewer than 40% of CBT clinicians routinely weigh their CBT patients (Int J Eat Disord. 2014 Dec 12. doi: 10.1002/eat.22369. [Epub ahead of print]. And, the authors found that a sizeable number of clinicians believed they should not share weight information with patients. Another issue was that many protocols do not directly address how, when, and why patients with eating disorders should be weighed.

**Four reasons why patients should be routinely weighed**

Drs. Waller and Mountford cited four main reasons for CBT therapists to weigh patients with eating disorders: for patient safety, to understand the patient’s eating patterns, to reduce patient anxiety and avoidance, and to modify the “broken cognition” or the patient’s disconnect about the link between eating and weight gain.

What is the best way to weigh CBT patients? One suggestion is to present the act of measuring weight simply as part of the therapeutic program, beginning with the assessment and the first therapy session. Presenting weighing as a rational and non-negotiable part of therapy will work with most patients, according to the authors, and only a few will question the rationale for it (i.e., ‘My last therapist did not weigh me.’). Exploring the reasons for weight change will help patients see such fluctuations in weight as a slow, boring process and to understand that most people gain or lose up to 2 lb even during the day. For anorexic patients, it is important to discuss the planned weekly weight gain target and to include this in future predictions and evaluations, according to the authors. Yet another suggestion from Drs. Waller and Mountford is that measuring weight be presented as a collaboration between patient and therapist.

**The process of weighing**

Some suggestions include reminding the patient--before she steps on the scales--that this is only one of four weight measurements used to establish an average weight. Another suggestion is that the patient and therapist view the scale weight at the same time. Then, whatever the weight and whatever the patient’s reaction, the goal is to treat the weight change as a long-term issue and not to get excited about it in the short term.

Transparency is important, and the weight should be shared with the patient and copies of each weighing kept by both therapist and patient. The authors suggest including two lines on the chart, the actual weight, augmented with a median line every 4 weeks, and the cumulative weight. Then, outcomes after 4 weeks, as indicated on the weight chart, can be used to challenge false beliefs, allowing the clinician to stress the difference between the patient’s beliefs about gaining weight and the actual impact of eating. Thus, the ‘broken cognition’ is repaired with consistent, repeated focus on the eating-weight link. Then, at the end of the session, planning food intake (exposure to ‘feared foods,’ behavioral experiments) and related behaviors (reduction in purging behaviors) should be linked to the patient predicting likely weight change as a result. This prediction is repeated at the beginning of the weighing process at the next session, which will help deal with the fact that the patient’s predicted eating pattern at the end of the session might not be what was actually eaten over the intervening week.

**Patient resistance and therapist justifications**

Sometimes it’s not only the patient who is reluctant about the process of weighing. Some clinicians are reluctant to weigh patients, even when a shows no reluctance to approach the scale. Therapists’ justifications for not weighing patients may reflect a belief that this will ruin the therapeutic relationship. Or, such justifications many reflect an attitude that the patient is usually weighed by someone else anyway, or that the patient has already weighed herself before the session, or a belief that weight can be judged by eye, or There just isn’t enough time to do it.”
The authors also found that some organizations have policies about weighing patients that are counter to effective delivery of CBT. Some everyday examples include weighing patients but not revealing the weight or asking other clinicians to weigh patients but then only asking for an update when substantial risk is identified. Some groups require that a patient be weighed only by a specific clinician and only on a particular day, making it impossible for a therapist to weigh a patient during therapy.

**Adaptations for specific groups**

Certain groups of patients, including inpatients, patients with high degrees of shame about their weight, morbidly obese patients, and those with medical complications, will need special adaptations for weighing. For example, at extreme levels, shame related to being weighed might interfere with the therapeutic alliance and with the individual’s ability to engage in therapy.

Finally, Drs. Waller and Mountford suggest that due to the diversity of current practices, future research should study the impact of training clinicians in the appropriate use of weighing. A second area of research involves the need for specific evidence that weighing is a necessary part of CBT. According to the authors, the overall goal would be to establish protocols that are clear about whether or not to weigh patients with eating disorders, and when and how to do so.

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**Testing Two Treatment Approaches and the Therapeutic Alliance**

*New information emerges about the causal direction of treatment for patients with bulimia nervosa.*

The importance of a strong therapeutic alliance for good outcome in treatment of bulimia nervosa (BN) was recently underscored in results from a two-site study of 80 adults (*J Consult Clin Psychol*. 2015. 83:637). The study examined whether therapeutic alliance affected the outcome in two psychosomatic treatments.

The adults, all of whom had *DSM-5* diagnoses of BN or partial BN (subjective rather than objective binge-eating episodes), were randomized to integrative cognitive-affective therapy (ICAT) or enhanced cognitive-behavioral therapy (CBT-E). ICAT, a recently developed treatment approach, emphasizes the role of emotion in bulimic behavior and also argues that bulimic behavior regulates emotion. Thus, interventions are aimed at identifying cues for binge eating and finding ways to help patients manage urges to binge. ICAT aims to identify cues for binge eating patterns and attempts to modify behaviors that lead to negative emotions. CBT-E is a revised version of DBT for BN that uses psychoeducation, self-monitoring, and behavioral exposure to normalize eating patterns and to attempt to modify cognition, especially overvaluation of shape and weight. In this study both groups had 50-minute treatment sessions over 17 weeks.

At each session and at the end of treatment, bulimic symptoms, such as frequency of binge eating and purging, were assessed. Therapeutic alliance was measured at sessions 2, 8, and 14, and 1 week from the end of treatment.

**The importance of the patient’s own characteristics**

Most of the 80 participants were white (88%) and female (90%); mean age was 27 years, and mean body mass index (BMI) was 23.9 kg/m². The authors found that patients reported strong therapeutic alliances that were stable over time; however, stronger overall therapeutic alliances led to greater reduction in BN symptoms. In turn, greater reductions in BN symptoms predicted improved therapeutic alliance. For example, greater depression, anxiety, and emotional dysregulation were associated with
lower overall alliance. There were interactions between coexisting psychological variables and alliance. Participants with fewer symptoms reported stronger overall therapeutic alliances in the ICAT group, while those with greater symptomatology reported stronger overall therapeutic alliances in CBT-E.

The results suggest better therapeutic alliance leads to reduced BN symptoms, which then leads to improvements in alliance. The authors do note that the small size of the study (80 patients and 4 therapists) limited the study’s ability to address the importance of the patient’s and therapist’s individual contributions to the alliance. Nonetheless, the findings underscore the value of a strong therapeutic alliance.

### Comparing Healthcare Costs in the VA System

*In a comparison of BED and EDNOS patients and those without eating disorders, costs were highest for BED care.*

Healthcare costs are high for patients with eating disorders, but most research in this area has been limited to evaluating costs of care for AN and BN patients. When a team compared the one-year health care costs and use of healthcare facilities for patients with binge eating disorder (BED), those with eating disorder not otherwise specified (EDNOS), and matched control patients without an eating disorder, costs for BED and EDNOS were well above those for people with no eating disorders (*Int J Eat Disord.* 2015, May 8, doi:10.1002/eat.22427. [Epub ahead of print])

Brandon K. Bellows, PharmD, of the VA Salt Lake City Healthcare System, Salt Lake City, UT, and fellow researchers first identified patients with BED or EDNOS from clinical notes from 2000 to 2011 from the Department of Veterans Affairs electronic health record database. Inpatient, outpatient, pharmacy, and total overall costs were then compared.

The mean total unadjusted one-year costs were $33,716 for patients with BED, $37,052 for EDNOS-only patients, and $19,548 for patients without eating disorders. After statistically adjusting for patient characteristics, BED patients had one-year total healthcare costs that were $5,589 higher than those of EDNOS-only patients and $18,152 higher than for patients without eating disorders.

An important part of this study is that the BED and non-ED groups were matched for body mass index (BMI, kg/m²). This helps address the question of whether the complications and costs associated with BED are simply due to obesity; these results suggest they are not.

### Augmentation Therapy for Inpatients with Anorexia Nervosa

*Two atypical antipsychotics boosted the effects of SSRIs.*

Effective treatments for adults with AN remain elusive, and the results of pharmacologic treatments have been particularly discouraging. Recently, researchers in Italy reported that augmentation of SSRI therapy with an atypical antipsychotic, aripiprazole, helped reduce eating-related obsessions and compulsions among a group of hospitalized patients with AN (*PLOS One* doi:10.1371/journal.pone. 0125569 April 29, 2015).

Dr. Enrica Marzola and colleagues at the University of Turin’s Eating Disorders Center for Treatment and
Research, Turin, Italy, revisited the use of the atypical antipsychotics olanzapine and aripiprazole as augmentation agents of selective serotonin reuptake inhibitor (SSRIs) in adult inpatients with AN. The authors selected the two atypical antipsychotics based upon the neurobiology of AN. This included alterations of dopamine and serotonin in pathways to the brain; the dopamine-blocking properties of these agents; weight and body shape; and their positive effects on safety, anxiety, eating psychopathology, and on depression. The authors also noted that one effect of some atypical antipsychotics is increased appetite and food intake, enhancing weight gain.

Dr. Marzola and her team hypothesized that augmenting treatment with SSRIs with atypical antipsychotics could be more effective than SSRI monotherapy, particularly in the case of patients with depression and obsessive-compulsive disorders. To study this, the authors did a retrospective chart review of patients hospitalized at their eating disorders center between January 2012 and May 2014.

All subjects were assessed with the Structured Clinical Interview for DSM-IV Axis I disorders and were included in the study only if they had AN. In addition, all participants had been taking an SSRI for at least 6 weeks at admission and had either olanzapine or aripiprazole added as augmentation therapy while hospitalized. Patients were excluded who were receiving a different category of antidepressant, or who had lifetime use of any antipsychotic or mood stabilizers, or who had been hospitalized due to a comorbid Axis I disorder, or with certain medical comorbidities.

Measures included body mass index (BMI, kg/m²), weekly incidence of binge-purge behaviors, including use of diuretics or laxatives, and the amount of daily physical exercise. Anxiety and depression were measured with Hamilton scales for Anxiety and Depression and the Yale-Brown-Cornell Eating Disorders Scale.

One-hundred eighty-seven charts were reviewed, yielding a final group of 75 patients. Mean age was 25 years; mean BMI was 13.9, and the mean duration of illness was 6.9 years. All patients were receiving SSRIs (sertraline, citalopram, escitalopram, or fluoxetine) when they were admitted to the treatment center. After analysis, three treatment groups emerged: 32.9% remained on SSRIs as monotherapy; 32.0% received adjunctive aripiprazole; and 35.5% received adjunctive olanzapine.

Differences emerged in the treatment groups
While the sample was not randomized to treatment condition, there were no differences by age, gender, BMI, or by AN subtype, duration of illness, exercise, or use of diuretics. Significant improvements emerged across the three treatment groups. Those in the aripiprazole group had significantly greater improvement on the global score and both subscales of the Yale-Brown-Cornell Eating Disorders Scale compared with the two other treatment groups.

Clearly there are limitations to this study (including the small sample size and lack of randomization, for example). Nevertheless, the results support continued investigation of aripiprazole. They may also find a way to conceive of the role of medications in AN by targeting individual symptoms (in this case, ED-related cognitions and rigidity) as opposed to targeting AN as a whole.

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**Parent Caregivers Need TLC, Too**

*Four areas of need were highlighted in a small study in Ireland.*

Serving as a caregiver has challenges; being a caregiver to an adolescent with anorexia nervosa (AN) can be even more difficult than usual. Parents of AN patients face stigma, lack of access to services, ignorance about AN, and limited support. A recent pilot study by two researchers at Trinity College and
Four key themes
Carol McCormack and Edward McCann discovered four key themes when they recruited a small group of parents of teens with AN who were being treated at an outpatient clinic in Ireland.

The first area of concern had to do with the family environment, where parents reported that “all aspects of family life were affected” by the illness. While families felt that the illness had initially “taken over” the family, this feeling gradually waned as the teen began to recover. Communication within the family, including how the young patient should be “managed” or supervised, and conflicts about stigma and guilt were all important themes.

A second area of concern was the psychosocial impact upon the parents, particularly social, technical, and emotional components. Restrictions on family meals away from home were a source of frustration, as meals tended to be limited to settings acceptable to the adolescents. One finding was that parents who spent more time at home reported a greater number of significant disturbances than did those who worked outside of the home.

The third area of concern surrounded quality of care and the sometimes-negative experiences with available services. Some parents and their children had been to general practitioners who had dismissed the teen’s problems or seemed unaware of available treatment options, and other parents and teens were frustrated by the delays in finding appropriate help. A fourth area was the need for more information or referral to a support group, which parents felt would have been very beneficial to them.

Finally, despite the challenges of care-giving, parents also clearly articulated that they were able to recognize positive aspects to the illness, including the hope of recovery, development of inner strength, and improved family communication.

The researchers stressed that their study results point to an urgent need for additional information and support for parents, so that they may better cope with a child with an eating disorder. In addition, they noted that professionals in non-specialist areas may also benefit from additional skills training.

Compulsory Refeeding for Severely Ill AN Patients

Extreme measures worked for one group of critically ill patients.

Effective treatments for AN are badly needed, particularly for adults, according to Christoph Born, MD, and a team at Ludwig Maximillians-University in Munich, Germany. These researchers recently described their group’s novel intensive care approach for severely ill patients with AN, a program involving mandatory hospitalization, guardianship, and for some, installation of a percutaneous gastric feeding tube (BMC Psychiatry 15:57, 2015.).

A study group with extremely low body weight
The authors reported on a group of 68 patients with AN who were severely underweight and who had been admitted to their hospital between 2000 and 2013; relapse and remission were common. Seventy-five percent of participants had BMIs under 13 kg/m² on admission. Legal guardianship was established on the basis of Bavarian law. Patients were offered regular meals and a percutaneous gastric feeding tube was recommended (84% received them).
The percutaneous feeding tube was thought to have several advantages over a nasogastric tube, including avoidance of damage to the nose or upper GI tract. In addition, patients were able to take food orally, and the tube could be used for supplementary feeding. Other important considerations were potentially decreasing the chances that patients could manipulate or remove the tube and minimizing the stigma. All the AN patients were required to participate in common meals on the ward. Gastric tube feeding with a high-caloric solution (up to 3000 kcal/day) was provided on an individualized basis. The primary goal was to help patients attain a BMI of 17 by gaining 700 to 1000 gm per week.

Tube feeding was halted once the patient reached a BMI of 17, and the feeding tube was removed after body weight remained stable for 2 weeks. Aftercare within a specialized ED setting was then arranged.

Was the extreme program effective?
Dr. Born reported that 84% of the patients had a percutaneous gastric feeding tube implanted; 3 had nasogastric tubes inserted; and 8 had neither because of contraindications. Mean BMI at admission was 12.3, and this rose to a mean of 16.7 at discharge. Duration of illness was shorter and weight gain during treatment was higher in those with restrictive type AN (ANR group) than in those with binge-purge type AN (ANBP group).

Treatment lasted significantly longer in those with feeding tubes, but those without a feeding tube were younger, had been ill for a shorter time (7.3 vs. 9.9 years), and had slightly higher admission BMIs. Patients who attained the BMI goal of 17 were actively encouraged to seek further therapy. Those with ANBP were more likely to seek treatment in a psychotherapeutic or psychiatric hospital than were patients with ANR.

The authors concluded that patients with severe AN can be successfully treated using a guardianship and tube feeding regimen such as theirs. They added, however, that little is known about the long-term outcome of AN patients after refeeding programs are completed, and they correctly note that the amount of lasting cognitive change is unknown. Furthermore, the goal BMI (17) represented a clinically significant change in this severely ill group, but was still a very low target BMI.

The authors referenced an earlier 13-year follow-up program of 484 adult patients with AN in which 60.3% of patients had fully recovered, 25.8% had good outcomes, 6.4% had bad outcomes, 6.4% had a severe outcome, and 1.2% had died (Diabetes Metab 2011; 37:305). In that study, 8 factors were linked to the lack of recovery at 2 years: low BMI at discharge, low energy and low fat intakes, high drive for excessive exercising, high scores for perfectionism, interpersonal distrust and anxiety, use of tube feeding, and poor adherence to treatment.

**Gender Identity and Eating-Related Pathology**

*Transgender youth were at highest risk of developing an eating disorder.*

Transgendered individuals are at increased risk of developing eating disorders and of using compensatory behaviors, according to the results of a large national survey of college students. The study, believed to include the largest number of transgender participants ever to be surveyed about eating disorders and compensatory behaviors, included 289,024 students from 223 US universities who were participants in the American College Health Association-National College Health Assessment II (J Adolesc Health 2015;doi.org/10.1016/j.jadoleshealth2015.03003. [Epub before print].

As Dr. Elizabeth W. Diemer of Washington University School of Medicine, St. Louis, and her colleagues have reported earlier, qualitative research suggests that transgender individuals may experience greater-
than-normal body dissatisfaction, and thus may be at greater risk of disordered eating (Int J Eat Disord. 2002; 32:473; Int J Eat Disord. 1998; 24:449). Despite this, the authors point out that results of empirical studies of associations between transgender and eating disorders have been inconsistent (Eat Weight Discord. 2013; 3:18).

To date, only one study has investigated associations between gender identity and disordered eating among transgender and cisgender groups derived from the same source population (cisgender is the opposite of transgender, or having a current sexual identify that matches one’s gender assigned at birth). That study, conducted among Finnish twins and their siblings, used “conflicted gender identity” rather than self-identified transgender status (Sex Roles. 2010; 63:118). The results indicated that women with “conflicted gender identity” had higher EAT scale scores than did their non-gender-conflicted counterparts.

The students participating in Dr. Diemer and colleagues’ study had a median age of 20 years and were surveyed between fall 2008 and fall 2011. Students in randomly selected classes were asked to complete the survey on paper or a link to the Web-based survey was sent to a random sample of enrolled students. The ACHA-NCHA questionnaire collected anonymous information about mental health, substance use, sexual behavior, and nutrition. In the demographic section of the questionnaire, students were asked several questions related to sexual orientation and gender identity.

For the current analysis, information on gender identity and sexual orientation was combined into a seven-level variable: transgender, cis-gender sexual minority (SM) men, cisgender unsure men, heterosexual men, cisgender SM women, cisgender unsure women, and cisgender heterosexual women. Cisgender heterosexual women served as the reference group, as most of the existing ED literature largely focuses on them. Due to a relatively low number of transgender respondents (n=479), they were analyzed as a single group.

**A small number self-identified as being transgender**

Of the nearly 300,000 participants 0.17%, or 479, identified themselves as transgender; 2.0% (n=5977) identified themselves as cisgender SM men; 0.58% (n=1662) identified themselves as cisgender unsure men; and 32% (n=91,599) viewed themselves as cisgender heterosexual men. Among the women, 3% (n=9445) identified themselves as cisgender SM women; 1% (n=3395) as cisgender unsure women; and 61% (n=176,467) as cisgender heterosexual women. The majority of participants were European Americans, and almost all were full-time students.

Approximately 2% of the sample had received an eating disorder diagnosis during the past year. In the last month use of vomiting or laxatives was reported by 3% (n=8054), while diet pills were used by 3%. The highest rate for self-reported eating disorder diagnosis and past-month use of diet pills and vomiting or laxative use was found among transgender students. Past-year ED diagnosis was more common in cisgender sexual minority men and cisgender sexual orientation unsure men and women than among heterosexual women.

**Some possible reasons for higher risk among transgender patients**

Several factors could help explain the findings, according to the authors. Transgender individuals may use disordered eating behaviors to suppress or to accentuate particular gendered features. Minority stress has also been identified as a potential factor in the association between transgender identity and disordered eating. Among lesbian, gay, and bisexual persons, a strong connection has been drawn between higher levels of minority stress and poorer mental health outcomes (Am J Public Health. 2001; 91:927). Transgender students who are uncertain of their sexual orientation may experience even more minority stress, and thus be more at risk for disordered eating. Finally, an earlier study showed that 75% of transgender participants had received counseling for their gender identity concerns (National Center for Transgender Equality and National Gay and Lesbian Task Force; Washington, DC, 2001). This level of
Disturbed Endocannabinoid Responses to Hedonic Eating Detected Among AN Patients

Physiologic dysregulation may be the culprit.

Two main components drive eating behavior: maintenance of energy balance (homeostatic eating), and the rewarding or pleasurable qualities of food (hedonic eating). Italian researchers have uncovered what may be a dysfunctional reward mechanism in a small study of 7 underweight and 7 weight-restored patients with anorexia nervosa (AN) (Am J Clin Nutr. 2015. 101:262).

Endocannabinoids are a set of naturally occurring brain substances that impact mood, learning, appetite, and brain plasticity. Food ingestion is periodically controlled by the endocannabinoid system. As Dr. Alessio Maria Monteleone and co-authors point out, in particular, hypothalamic and mesolimbic endocannabinoids are produced after food deprivation, and increase appetite by stimulating neurochemical pathways underlying both homeostatic and hedonic eating.

In an earlier study by the same researchers, hedonic eating in healthy subjects increased concentrations of ghrelin and 2-arachidpnoylglycerol, suggesting that these two markers modulated food-related reward (J Clin Endocrinol Metab. 2012; 97:E917). In the current study, the authors once again investigated the physiologic modulation of food-related reward, but this time studied patients with active AN and weight-restored patients with AN. The authors assessed peripheral endocannabinoid responses to hedonic eating in these patients, and compared these levels to those established in the previously studied healthy participants. Levels of other mediators were also measured, including two receptors whose activation, in opposition to that of cannabinoid-1, may reduce food intake and reward.

Patients with AN who were consecutively admitted to the eating disorder inpatient unit of Villa Garda Hospital, Naples, Italy, were screened for the study. All those selected for the study met DSM-IV criteria for past or present AN.

To test hedonic and non-hedonic eating, before the first session all participant were asked to indicate his or her favorite food, a food they would eat just for pleasure, even when full. Through a series of steps, including a 12-hour fast, the participants rated their hunger and satiety on a visual analog scale. Blood samples were drawn immediately after exposure to the favorite food and within 10 minutes after the individuals freely ate their favorite foods. In the second procedure, participants were exposed to a non-favorite food and had to eat an equivalent amount of it.

Unexpected results
Surprisingly, in both hedonic and nonhedonic eating sessions, no significant difference emerged between groups in scores of hunger, satiety, urge to eat, or in the pleasantness of experiencing a mouthful of the presented food and the amount of food each participant would eat. In all groups, hunger and satiety scores before hedonic eating did not differ from those before nonhedonic eating, whereas scores for the urge to eat, pleasantness of experiencing a mouthful of the presented food, and the amount of food eaten were significantly higher before eating the favorite food than before eating the non-favorite food.
When the authors compared the results from their study of underweight and weight-restored AN patients to earlier levels established from normal-weight healthy controls, they found altered plasma concentrations of 2-arachidonoylglycerol after hedonic eating in both groups of AN patients.

These results need to be replicated and extended, but they support the idea that responses of the endocannabinoid system to hedonic eating appear to be disturbed and may play a role in AN.

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**Nutrition and Intake among Women with Anorexia Nervosa**

_Counseling should address total intake._

Prolonged dietary restriction is at the heart of AN, and nutritional counseling and treatment are essential. However, getting an accurate picture of the nutrient intake of an AN patient is far from easy and is often prone to error, according to Susan K. Raatz, of the USDA Human Research Center, Grand Forks, ND, and colleagues at the University of Minnesota, the University of North Dakota, the Neuropsychiatric Research Institute, Fargo, ND, and the University of California-San Francisco. Dr. Raatz notes that attention has been focused on reduced intake of energy and macronutrients, while few studies have described total micronutrient intake in patients with AN.

Dr. Raatz and colleagues assessed total reported energy and nutrient intake in a sample of women 19 to 30 years of age, with both restricting and binge-purge type AN (Nutrients. 2015. 7:3652). They then compared their results with the reported intake of a representative group of women who participated in the “What We Eat in America” portion of the National Health and Nutrition Examination Survey (NHANES) 2011-2012. Participants with either binge-purge or restricting-type AN were assessed with structured interviews, and their BMIs were determined.

To obtain detailed 24-hour dietary recall information, all participants were surveyed in telephone interviews on three separate occasions by trained interviewers using a structured nutritional interview, the NDS-R. To provide a comparison, the nutrient intake of non-pregnant women aged 19 to 30 years was derived from the 2011-2012 WWEIA/NHANES survey.

The mean age of participants was 22.5 years, and the average BMI was 17.2 kg/m². Intake of most nutrients was insufficient but some participants reported high intake levels when compared to Dietary Reference Intake levels. Some participants may have inaccurately recorded their intake because reported intakes for some exceeded estimated energy needs, even though these participants maintained very low body weights.

The authors suggest that counseling for AN patients be centered upon total food intake, to improve energy intake and to lessen individual gaps in nutrition.

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**BOOK REVIEW: Critical Care for Anorexia Nervosa: The MARSIPAN Guidelines in Practice**

(Paul H. Robinson and Dasha Nicholls, Eds. Springer International Publishing, Switzerland, $109)

This recently published small volume is a wonderful addition to the bookshelf and literature pertaining to anorexia nervosa. The book is based on the work of the MARSIPAN (Management of Really Sick Patients with Anorexia Nervosa) Guidelines Group. It is highly readable and well organized.
An introductory chapter provides a number of case vignettes describing problems encountered when treating severely ill individuals with AN, which will be all too familiar to eating disorder practitioners. Thereafter, there are two chapters on the approach to child and adolescent patients and two regarding treatment of adult patients. In each instance, there is a chapter primarily from a mental health perspective and one primarily from a medical care perspective. Last, there is an interesting chapter on legal and ethical aspects of treating patients with severe AN.

This book has a number of very useful aspects. For example, readers will find a thorough and thoughtful discussion of the role of nasogastric tube feeding, both in regard to adolescent and adult patients. The pediatrics- and medicine-oriented chapters provide thorough discussions of approaches to medical problems encountered in people with severe AN, and clearly reflect extensive knowledge and experience on the part of the authors. The issue of refeeding syndrome is an important one when treating people with severe AN, and that is well-covered. Another very useful aspect of this book is that the “issue of underfeeding” (providing calories far below that which would be tolerated and needed for recovery) is also discussed. The format includes many descriptive and illuminating cases. Finally, the chapter on ethical issues includes an appendix that provides a framework that could be used for trying to assess decisional capacity in AN.

The treatment of individuals with severe AN is one of the great challenges of doing eating disorder work, and this volume provides very useful guidance for that task.

— SC

### QUESTIONS AND ANSWERS

#### Are Chromium Supplements Useful for Patients with Binge Eating Disorder?

**Q.** I recently heard a colleague talking about chromium supplements for patients with binge eating disorder (BED). Is there any validity to this approach? *(GS, Melbourne, Australia)*

**A.** Chromium was discovered in France in the late 1790s, but it was the 1960s before it was recognized as being an important trace element. Chromium is an essential element that affects insulin sensitivity and serotonin function. Chromium supplementation has been widely studied for glucose regulation in patients with type-2 diabetes mellitus and related metabolic conditions and for mood regulation in patients with atypical depression.

At the 2015 ICED meeting in Boston, Lauren Breithaupt from George Mason University and colleagues at the University of North Carolina, Chapel Hill, reported the results of the first pilot study of chromium supplementation for patients with BED. Twenty-one (of 24 randomized) overweight adults with BED completed a 6-month placebo-controlled study of chromium picolinate (CrPic). At a 3-month follow-up visit, all the subjects completed feasibility and acceptability questionnaires. According to the authors, the study results were overwhelmingly positive. Participants felt the study was helpful in terms of symptom improvement and reported no barriers to treatment. No study participants dropped out due to negative side effects. Little is known about the true effectiveness of supplements for eating disorder treatment. These results should encourage further work in the area.

— SC

#### Can Leptin Levels Be Used to Predict Outcome in Anorexia Nervosa?

**Q.** I’ve heard that leptin, a hormone produced by fat cells and that can reflect body fat stores, may help predict the outcome of treatment for anorexia nervosa (AN). Can you comment on this? *(TJ, Dallas, TX)*

**A.** A recent study at Columbia University and Florida State University evaluated whether leptin levels could predict a positive outcome for women treated for AN. Jonathan Hersch and colleagues reported at
the recent International Conference on Eating Disorders in April that his group evaluated a group of 54 women hospitalized for acute treatment of AN. After the women had gained and maintained a body mass index (BMI, kg/m²) of 19.5 for at least 2 weeks, the researchers evaluated their body composition using total body magnetic resonance imaging and fasting leptin levels. The 54 patients were asked to return to the clinic one year later, for a brief clinical assessment and weight evaluation. Their treatment outcome was defined by their BMIs: those who maintained a BMI greater than 18.5 kg/m² were considered successful, while those with BMIs lower than this were deemed treatment failures. The researchers then used independent sample t-tests, demographic data, body composition, and leptin levels to compare the “success” and “failure” groups. Binary logistic regression was also constructed to evaluate the relationship between pre-discharge leptin level and outcome at one year.

Data from 46 participants were available for analysis. Twenty-four of the women met the outcome criteria for success, while 22 were deemed to have treatment failure. There were some differences between the two groups. The “success” group tended to be slightly younger (23±4 years vs 26±6 years; p=0.09) and had a somewhat shorter duration of illness (6±3 years vs 9±8 years; p=0.08). The pre-discharge BMIs were not different between the two groups but percent body fat was higher in the “success” group (27±4%) compared to the “failure” (23±5%) group (p=0.003).

In the “success” group, both leptin (16±18 ng/mL) and leptin normalized for fat mass (0.99±0.97 ng/mL/kg) levels were significantly higher compared to those of the “failure” group (leptin: 6.3±6.4 ng/mL p=0.02, leptin/fat mass: 0.47±0.43 ng/mL/kg, p=0.03). Pre-discharge leptin (p=0.04) and leptin/fat mass (p=0.02) but not BMI (p=0.20) significantly predicted treatment outcome at one year.

This study suggests leptin levels may eventually be a clinically useful predictor of outcome in AN. The study is a good start, but more research is needed to confirm the potential role of leptin as a clinical marker in AN.

— SC

Also in This Issue

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- A Promising Intervention for Binge Eating
- Stepping on the Scale: Not Such a Simple Process
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- Comparing Healthcare Costs in the VA System
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- Questions And Answers: Can Leptin Levels Be Used to Predict Outcome in Anorexia Nervosa?
Coming in the September/October Issue

**Technology and the Changing Face of Treatment**
At the International Conference on Eating Disorders in Boston this spring, numerous sessions were dedicated to the use and impact of electronic data in eating disorders treatment, including blogs, video chats, and special apps. This and more from the ICED.

**PLUS**

- Alternate-day Fasting and Disordered Eating Symptoms
- Does Lower Energy Intake Lower the Risk of Cancer in AN Patients Due to Low Intake?
- Effects of Anorexia Nervosa on Bone Health
- The Treatment-resistant Patient
- And much more

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