

In Brief

The medical risks associated with eating disorders in diabetes are significant. Clinicians working with patients who are at risk for eating disorders should be cognizant of patterns that might indicate the presence of disturbed eating behaviors in their patients. This article discusses the warning signs, screening tools, and diagnostic criteria associated with eating disorders in type 1 diabetes.

Eating Disorders and Diabetes: Screening and Detection

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The association of eating disorders in patients with diabetes has been a topic of great interest during the past two decades. Although the prevalence of the association and the increased morbidity and mortality in those affected have been the subjects of numerous investigations, early detection, prevention strategies, and treatment approaches are less well defined.

Eating disorders are medical illnesses that can have a potentially life-threatening impact on the health status of affected individuals.¹ Diagnostic criteria for eating disorders, based on psychological, behavioral, and physiological characteristics, provide important guidance for clinicians in identifying and referring patients for appropriate treatment. The purpose of this article is to present a discussion of the warning signs, screening tools, and diagnostic criteria associated with eating disorders in type 1 diabetes (ED-DMT1).

Warning Signs

Although early recognition of risk for an eating disorder may help with prevention, there are no validated screening tools to help identify those in need of intervention. However, there are clinical characteristics that may lead practitioners to a more detailed discussion with patients in an attempt to earlier identify those in need of treatment. Because of the medical risks associated with eating disorders in diabetes, clinicians working with individuals with diabetes, especially adolescent girls and adult

women, should be cognizant of patterns that might indicate the presence of disturbed eating behaviors. In individuals with diabetes, several warning signs may suggest the presence of an eating disorder.^{2,3} These include:

- Overall deterioration in psychosocial functioning, including school attendance and performance, work functioning, and interpersonal relationships
- Increasing neglect of diabetes management, including blood glucose monitoring, insulin titration (insulin omission), and adherence to other medications
- Erratic clinic attendance
- Significant weight gain or loss
- Frequent dieting and increased concern about meal planning and food composition
- Poor body image/low self-esteem
- Purging behaviors such as excessive exercise, laxative/diuretic use, or vomiting
- Recurrent/frequent diabetic ketoacidosis
- Binging
- Depressive symptoms, including sad mood, low energy, poor concentration, fatigue, and disrupted sleep. Although depression and disturbed eating behavior often coexist, poorly controlled diabetes can also directly contribute to depressive symptoms.

Deliberate insulin omission is a common strategy used to control weight. If worsening metabolic control is the result of intentional insulin

omission, patients may initially deny that they have engaged in this behavior. Such denial may allow them to avoid reactions of disappointment or criticism from their family or diabetes team members. It may also help them to avoid the threat of weight gain often associated with improving metabolic control. Indeed, it can be challenging for family members and caregivers to tolerate the knowledge that individuals with diabetes continue to engage in potentially dangerous disturbed eating behavior, particularly insulin omission. Sometimes family members will raise concerns about disturbed eating behavior before patients with diabetes do so. If an eating disorder is known or suspected to be present, early referral to a mental health professional with experience working with individuals with eating disorders is warranted.

It is important to note that omission or restriction of insulin may not just be related to concerns about weight. Other factors may be driving these behaviors, such as diabetes-specific distress, overall psychological symptoms, or fear of hypoglycemia.⁴

Because disordered eating behaviors are often well hidden, patients should be encouraged to discuss issues such as their current level of satisfaction with their body weight and shape. Clinicians should also try to understand their patients' patterns of insulin use. It is important to use sensitive, open-ended questions constructed to increase the clinician's understanding of the patient's situation without the risk of unintentionally "educating" the patient about these dangerous behaviors.

Screening for Disturbed Eating Behaviors in Type 1 Diabetes

Regular screening for disturbed eating behaviors and eating disorders should be incorporated into the primary medical care of individuals with diabetes, likely beginning in the pre-teen years. Questions about satisfaction with weight and shape, dieting, binge eating, and weight control behavior can uncover difficulties with body image and eating behavior.

In the research literature on eating disorders and diabetes, the most commonly used screening tools have been instruments originally designed for use in the general population. Current diabetes-specific screening tools have not yet been validated and are typically designed for research purposes. As such, they are often too

lengthy for routine use in clinical practice. However, there are well-validated self-report screening measures for eating disorders that can be useful in the medical clinic setting. These include the Eating Attitudes Test⁵ and the modified Diagnostic Survey for Eating Disorders,⁶ both of which have been used in individuals with diabetes.

Diagnoses should be confirmed by clinical interview in those individuals whose scores on a self-report measure indicate the possibility of a clinically significant eating problem. Overeating and binge eating during episodes of hypoglycemia are fairly common and can be associated with other difficulties related to eating behavior.

Initial assessments should involve a careful history and physical examination, including an eating disorder symptom history and assessment for complications associated with poor diabetes control. Initial laboratory evaluation should include testing for complete blood count, comprehensive metabolic profile, liver enzymes, A1C, fasting cholesterol profile, and urine microalbumin. Depending on the degree of metabolic instability, there may be numerous abnormalities. More detailed information on inpatient assessment can be found in the article on p. 153 and information on outpatient assessment can be found in the article on p. 147 of this issue.

Patients with purging should be assessed for hypokalemia because this is frequently encountered.⁷ This will be helpful in recommending the appropriate level of care, and for many individuals, the results of these tests can help form part of the rationale for changing eating behavior.

Diagnosis

Disturbances of body image, eating attitudes, and eating behavior exist along a continuum in terms of severity and degree of related distress and impairment, making it difficult to define a threshold above which they can be considered "full-syndrome" disorders. Diagnostic criteria in use in clinical and research settings have fluctuated during the past two decades. This partially reflects the tension between defining phenotypic groups for study and identifying more heterogeneous eating disturbances in the general population. More severe symptoms at one end of this continuum often meet the diagnostic criteria for a full-syndrome eating

disorder outlined in the American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders*, 4th edition (DSM-IV) (Table 1).⁸ These disorders are categorized into three primary groupings, namely anorexia nervosa, bulimia nervosa, and eating disorder not otherwise specified (ED-NOS).

Anorexia nervosa

The diagnosis of anorexia nervosa requires refusal to maintain body weight above a minimally normal weight (e.g., 85% of that expected for height and age), severely disturbed body image with fears of gaining weight or getting fat despite being underweight, and undue influence of body weight or shape on self-evaluation. In postmenarcheal females, amenorrhea of at least 3 months' duration is also present, although anorexia nervosa is also diagnosed in males and in premenarcheal or postmenopausal females. There is sometimes a denial of the seriousness of the health consequences of the low body weight. Anorexia nervosa is divided into two types; in the binge eating/purging type, the individual regularly engages in binge eating and/or purging behavior, whereas in the restricting type, these behaviors are not present.

Bulimia nervosa

Bulimia nervosa involves binge eating episodes and compensatory behavior for weight control, both of which must occur, on average, twice weekly over a period of at least 3 months. Bulimia nervosa, like anorexia nervosa, is characterized by a strong influence of body weight and shape on self-evaluation. Bulimia nervosa also has two types. In the purging type, individuals regularly engage in purging behavior, including self-induced vomiting or the abuse of laxatives, diuretics, or enemas, whereas in the nonpurging type, individuals use nonpurging compensatory behavior to prevent weight gain, such as fasting or excessive exercise.

ED-NOS

ED-NOS is a broad grouping of disorders that are of clinical significance, but which do not meet the full diagnostic criteria for anorexia nervosa or bulimia nervosa. Examples of ED-NOS include binge eating disorder, variants of bulimia nervosa in which binge eating and purging occur less frequently than twice a

Table 1. Diagnostic Criteria for Eating Disorders⁸**Anorexia Nervosa**

- Refusal to maintain body weight at or above a minimally normal weight for age and height (e.g., weight loss leading to maintenance of body weight less than 85% of that expected; or failure to make expected weight gain during period of growth, leading to body weight less than 85% of that expected)
- Intense fear of gaining weight or becoming fat, even though underweight
- Disturbance in the way in which one's body weight or shape is experienced, influence of body weight or shape on self-evaluation, or denial of the seriousness of the current low body weight
- In postmenarcheal females, amenorrhea (i.e., the absence of at least three consecutive menstrual cycles). A woman is considered to have amenorrhea if her periods occur only following hormone (e.g., estrogen) administration.
- Specific types:
 - Restricting type: during the current episode of anorexia nervosa, the person has not regularly engaged in binge eating or purging behavior (i.e., self-induced vomiting or the misuse of laxatives, diuretics, or enemas)
 - Binge eating/purging type: during the current episode of anorexia nervosa, the person has regularly engaged in binge eating or purging behavior (i.e., self-induced vomiting or the misuse of laxatives, diuretics, or enemas)

Bulimia Nervosa

- Recurrent episodes of binge eating. An episode of binge eating is characterized by both of the following: 1) eating, in a discrete period of time (e.g., within any 2-hour period), an amount of food that is definitely larger than most people would eat during a similar period of time and under similar circumstances, and 2) a sense of lack of control over eating during the episode (e.g., a feeling that one cannot stop eating or control what or how much one is eating).
- Recurrent inappropriate compensatory behavior to prevent weight gain, such as self-induced vomiting; misuse of laxatives, diuretics, enemas, or other medications; fasting; or excessive exercise
- Binge eating and inappropriate compensatory behaviors both occur, on average, at least twice a week for 3 months
- Self-evaluation unduly influenced by body shape and weight
- Disturbance does not occur exclusively during episodes of anorexia nervosa
- Specific types:
 - Purging type: during the current episode of bulimia nervosa, the person has regularly engaged in self-induced vomiting or the misuse of laxatives, diuretics, or enemas
 - Nonpurging type: during the current episode of bulimia nervosa, the person has used other inappropriate compensatory behaviors, such as fasting or excessive exercise, but has not regularly engaged in self-induced vomiting or the misuse of laxatives, diuretics, or enemas

ED-NOS

- The ED-NOS category is for disorders of eating that do not meet the criteria for any specific eating disorder. Examples include:
 - For females, all of the criteria for anorexia nervosa are met except that the individual has regular menses
 - All of the criteria for anorexia nervosa are met except that, despite significant weight loss, the individual's current weight is in the normal range
 - All of the criteria for bulimia nervosa are met except that the binge eating and inappropriate compensatory mechanisms occur at a frequency of less than twice a week or for duration of less than 3 months
 - The regular use of inappropriate compensatory behavior by an individual of normal body weight after eating small amounts of food (e.g., self-induced vomiting after the consumption of two cookies)
 - Repeatedly chewing and spitting out, but not swallowing, large amounts of food
 - Binge-eating disorder: recurrent episodes of binge eating in the absence of the regular use of inappropriate compensatory behaviors characteristic of bulimia nervosa

week or in which individuals purge after eating normal amounts of food, and variants of anorexia nervosa, for example, in which amenorrhea of 3 months' duration is not present or in which significant weight loss has occurred but the individual remains above 85% of expected weight. There are also milder subthreshold variants of all of the above that do not meet full DSM-IV criteria, but which may still represent a significant health risk. Like full-syndrome eating disorders, subthreshold eating disorders also merit clinical attention, particularly in individuals with type 1 diabetes. This is because even mild eating disturbances can compromise metabolic control, and disturbed eating behavior is often persistent rather than transient in individuals with diabetes.⁹

Challenges to Early Detection and Diagnosis

Questionnaires have been established to identify eating disorder symptoms, but currently available tools are not sensitive to the specific weight and dietary pattern concerns of individuals with diabetes. Work is currently underway to validate a self-administered instrument that will screen for eating disorder symptoms in people ≥ 12 years of age with type 1 diabetes. Tools such as this will help to initiate conversations regarding disordered eating patterns with the goals of the initial assessment being to establish a valid diagnosis and to determine the appropriate level of care necessary with referral to a treatment program knowledgeable regarding both aspects of the ED-DMT1 diagnosis.

The traditional instruments used in various studies to diagnose an eating disorder in people with diabetes might confound the diagnosis and inappropriately overestimate the prevalence.¹⁰ Many eating disorder diagnostic instruments include statements that may be considered appropriate to people with diabetes yet indicative of an eating disorder in those without diabetes. On the other hand, such instruments could miss diabetes-specific disordered eating behaviors not germane to the general population—specifically, insulin omission. Thus, these instruments could actually lead to underdiagnosis. For example, validated diagnostic interviews with young girls with type 1 diabetes were conducted and revealed that during a 5-year period, half reported broadly

defined disturbed eating behavior at some point.⁹

Although there is no question about when to make a diagnosis of type 1 diabetes, the same is not true for an eating disorder; the timing of when (and if) to diagnose an eating disorder is not as readily apparent for a variety of reasons. There is a lack of screening tools for this specific population, and health care professionals are often not aware of the early signs of eating disorders in this population.³

Also complicating (and possibly camouflaging) the case finding is that the usual treatment of type 1 diabetes requires an intense focus on food choices, body weight, and the manipulation of insulin to balance the calories/carbohydrate received from food and expended by exercise. Ongoing education and scrutiny of related data to adjust diabetes treatment can interfere with the identification of someone exhibiting symptoms of an eating disorder.

When there is concern about symptoms of eating disorders, this is not always an easy topic to approach for patients or practitioners. If there is concern, early referral to a mental health provider or practitioner comfortable with the diagnosis and management of eating disorders is warranted.

Conclusion

The medical risks associated with eating disorders and diabetes are significant. Ideally, those diagnosed with ED-DMT1 will be involved with a team of providers who are comfortable with treating the eating disorder and who are knowledgeable regarding diabetes management given the differences that may exist between the treatment modalities. For those who have received the diagnosis of ED-DMT1, the personal struggles are intense, and the delicate balance of treatment is made more difficult by conflicting interventions. For these reasons, treatment centers with a collaborative ED-DMT1 team must be developed to offer patients, families, and providers the opportunity to address the very complex cycle connecting eating disorders and type 1 diabetes. Although very few centers with such resources are currently in place, establishing such centers of excellence, with an associated network of clinics that can provide this specialized care, is an important first step in addressing the unique needs of individuals with ED-DMT1.

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