Diabetes and Eating Disorders

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Abstract

The problem of insulin restriction is an important women's health issue in type 1 diabetes. This behavior is associated with increased rates of diabetes complications and decreased quality of life. Clinical and technological research is greatly needed to improve treatment tools and strategies for this problem. In this commentary, the author describes the scope of the problem of eating disorders and diabetes, as well as offers ideas about ways technology may be applied to help solve this complex problem.

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Recent controlled studies suggest that young women with type 1 diabetes have 2.4 times more risk of developing an eating disorder than age-matched women without diabetes.[1] Insulin restriction (i.e., administering reduced insulin doses or omitting necessary doses altogether) is an eating disorder symptom unique to type 1 diabetes, because intentionally induced glycosuria causes weight loss as calories spill into the urine. While not a formal medical diagnosis, coverage of this issue in the popular press uses the term, "Diabulimia."

Data from the The Diabetes Complications and Control Trial showed that intensive insulin management of diabetes could prevent medical complications, such as retinopathy, neuropathy, and nephropathy. However, it also showed that intensive insulin management is associated with weight gain.[2,3] It may be that the current goals of intensive diabetes management increase the risk for developing an eating disorder. Some researchers argue that the attention to food portions (especially carbohydrates), blood sugars, weight, and exercise that comprises the standard recommended medical treatment for type 1 diabetes parallels the rigid thinking about food and body image that is characteristic of women who have eating disorders but do not have diabetes.

Apart from restricting insulin for weight loss, women with eating disorders and type 1 diabetes typically struggle with symptoms similar to those of women without diabetes who have eating disorders. Core eating disorder symptoms include the pursuit of an excessively thin body ideal, eating patterns characterized by calorie restriction and/or episodes of binge eating, and using body weight and shape to determine self-worth. Eating disorders often overlap with symptoms of depression and anxiety. Type 1 diabetes can also raise a person's risk of depression and anxiety. As such, clinicians working with adolescent and adult women with diabetes should be watchful for indications of depressed or anxious mood, concerns about weight and body shape, unusual patterns

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of exercise (sometimes accompanied or followed by frequent hypoglycemia), and unusually low calorie meal plans. Unexplained elevations in hemoglobin A1c (HbA1c) values and repeated problems with diabetic ketoacidosis (DKA) should raise concerns about the specific problem of insulin restriction.

Widespread, intermittent insulin restriction has been reported among women with type 1 diabetes. However, this behavior is not limited to women who meet formal diagnostic criteria for eating disorders. One study found that 31% of women reported intentional insulin restriction. Rates of restriction peaked in late adolescence and early adulthood.[4] It may be that insulin restriction becomes a more significant problem in older adolescents, as parental supervision of insulin administration decreases, and then continues to progress throughout early adulthood. Once established as a long-standing behavior pattern, the problem of frequent and habitual insulin restriction may be particularly difficult to treat. For this reason, early detection and intervention appear to be important.

Studies show that recurrent insulin restriction places women at heightened risk for medical complications of diabetes.[5,6] Women reporting this behavior also have higher HbA1c, higher risk of developing infections, more frequent episodes of DKA, and more frequent hospital and emergency room visits than women who do not restrict insulin. Indeed, an 11-year follow-up study reports that insulin restriction conveyed more than a three-fold increased risk of mortality after controlling for age, A1c, and body mass index. Age of death was younger among insulin restrictors, with a mean age of death of 45 years, as compared to 58 years among those reporting appropriate insulin use.[7]

Disordered eating behaviors are often well hidden and denied. Patients decrease their frequency of glucose monitoring, "forget" to bring blood glucose records to medical appointments, and also find ways to influence blood glucose meters so that they record in-range blood sugars. More sophisticated meter technology, such as larger memory capacity and data down-loading, represent treatment advances that could assist with early detection. Broader adoption of continuous glucose sensors may become the next advance in this area because sensors offer patients and providers the ability to analyze patterns in daily blood glucose fluctuations. At this time however, it remains unclear as to how insulin-restricting patients will respond to this new level of detail in glucose monitoring. Some patients may use this newly available information as motivation to improve their blood glucose levels while others may find it overwhelming and become further disengaged. Additionally, it may be that access to such detailed information about blood glucose patterns will be misused by women intent on using hyperglycemia for caloric purging.

Little research has been done to determine the best treatment approaches for the problem of insulin restriction. However, evidence-based standards for treatments for eating disorders strongly support a multidisciplinary team approach. When designed to treat a patient with both type 1 diabetes and an eating disorder, such a team should include a diabetologist, a diabetes educator, a nutritionist with training in the treatment of eating disorders and diabetes patients, a psychiatrist for psychopharmacologic evaluation and treatment, and a mental health professional to provide individual therapy.

Because of the medical complexity caused by these two conditions, patients with diabetes and eating disorders require more medical monitoring than patients with diabetes alone. Medical and psychiatric inpatient treatment may be needed until patients are medically stable enough to engage in weekly outpatient treatment. Monthly appointments with the diabetologist or nurse educator may be necessary, as well as monthly appointments with a nutritionist. Laboratory tests (especially HbA1c and electrolytes) and weight checks should occur at each of the medical appointments and be shared with the treating mental health professionals. In order to provide the best quality treatment, open and frequent communication between team members is critical. New technologies aimed at improving the accuracy, speed, and cost-effectiveness of point-of-care laboratory results, and making their use broadly available in routine practice would provide a treatment advance.

Many patients may be unable to access appropriate treatment because it is difficult to find mental health practitioners with *both* diabetes and eating disorder treatment experience. Future treatment may rely on the Internet and other distance-bridging technologies that would allow patients greater access to consultation with experienced treatment teams. Such technologies would also be useful in providing specialized training and case consultation to practitioners interested in learning about treating diabetes and eating disorders. For example, the Internet is already widely used in many continuing medical education programs.

Technological advances can also be used to address specific treatment issues seen in these patients. For

example, the first challenge that most patients face is weight gain associated with insulin restart. Patients need to be taught to identify insulin edema, which may make them feel fat, bloated, and uncomfortable, as temporary water retention that is different from the development of fatty tissue. Special tools designed to measure water-related weight versus lean muscle mass versus fat mass could help patients tolerate the temporary weight gain related to edema. Additionally, newer insulin analogs, like Levemir® and Apidra®, show some evidence of improved weight profiles. Symlin® is associated with the side effect of appetite reduction and weight loss. Research is needed to develop additional insulin analogs that do not promote weight gain. As newer agents come to market, and as more research is done to understand their impact, we will learn more about how to use these tools to optimize treatment. Matching patients with appropriate tools will remain challenging because many of the newer agents have the same potential for misuse as the older insulin analogs.

Eating disorders coupled with diabetes represent some of the most complex patient problems to treat—both medically and psychologically. Given the extent of the problem among women with diabetes and the severe medical risks associated with it, further clinical and technological research aimed at improving treatments is critical to the future health of this at-risk population.

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