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Risk of eating disorders in adolescents with T1DM: diabulimia

Type 1 diabetes mellitus (T1DM) is a chronic disease in which nutrition is one of the fundamental pillars of treatment. Its diagnosis, particularly when it occurs during adolescence or early adulthood, has a significant psychological

impact. This impact is related to the perception of loss of autonomy, the need to adhere to strict therapeutic guidelines, and the effects on self-esteem. In this context, an increased incidence of eating disorders (EDs) has been observed in people with T1DM.

Eating disorders (EDs) comprise a group of disorders characterized by altered and persistent eating behaviors associated with excessive concern about weight, body image, or food intake, significantly affecting physical and psychological health. In the case of T1DM, the etiology of these disorders is multifactorial and includes genetic, cultural, and environmental factors. Sociocultural pressure toward thinness, together with constant exposure to unrealistic body ideals, contributes to body image dissatisfaction. In turn, the abundance of food in developed societies favors cycles of restrictive dieting that often fail, generating frustration and emotional distress.

T1DM treatment per se introduces specific risk factors for the development of EDs. After insulin therapy is initiated, rapid recovery of body weight is common, which may lead some patients to intentionally omit insulin to lose weight through urinary glucose excretion. Similarly, fear of hypoglycemia may lead to maladaptive eating patterns, such as increased carbohydrate intake or episodes of overeating. The continuous monitoring of food intake required to maintain adequate glycemic control may lead to obsessive behaviors that favor the development of these disorders.

The coexistence of EDs and T1DM is associated with deterioration of metabolic

control and an increased risk of both microvascular and macrovascular complications. In addition, alterations in personal identity, negative perceptions of the disease, and difficulties in family dynamics are observed, further complicating clinical management. Despite their relevance, diagnosing EDs in patients with T1DM is complex because of both the tendency of patients to conceal symptoms and the lack of specific training among healthcare professionals.

RISK FACTORS

Regarding risk factors, ED onset usually occurs between 12 and 25 years of age, » coinciding with key stages in the deve-

TABLE: Risk factors associated with eating disorders

CATEGORY	FACTORS	DESCRIPTION
Biological and genetic factors	Genetic predisposition	Greater likelihood of developing an eating disorder (ED) in the presence of a family history.
	Neurobiological alterations	Dysregulation of neurotransmitters such as serotonin and dopamine, related to appetite, mood, and reward.
	Hormonal changes	Puberty and hormonal fluctuations influence body perception and appetite, particularly in adolescents.
	Metabolic factors	Biological tendency toward rigid weight control or increased appetite in stressful situations.
Psychological factors	Perfectionism	Pursuit of absolute control over the body and eating.
	Low self-esteem	Personal self-worth is linked to body image and weight.
	Difficulties in emotional regulation	Use of restriction or binge eating to cope with anxiety or distress.
	Body image distortion	Altered perception of one's own body before the onset of the ED.
	High self-demand and need for control	High personal demands; control acts as a defensive mechanism.
	Traumatic experiences or abuse	Increase the risk of developing an ED.
	History of bullying or teasing	Negative experiences related to body image.
Sociocultural factors	Aesthetic and cultural pressure	Idealization of thinness as synonymous with success and social acceptance.
	Social media and mass media	Exposure to unrealistic models that promote comparison and low self-esteem.
	Weight-critical environments	Comments or excessive control over eating within the family or social environment.
	Dysfunctional family models	Overprotection, excessive control, or family conflict.
	Performance-related factors	Sports or artistic settings that encourage dietary restriction.

THE COEXISTENCE OF EATING DISORDERS AND T1DM IS ASSOCIATED WITH DETERIORATION OF METABOLIC CONTROL AND AN INCREASED RISK OF BOTH MICROVASCULAR AND MACROVASCULAR COMPLICATIONS. IN ADDITION, ALTERATIONS IN PERSONAL IDENTITY, NEGATIVE PERCEPTIONS OF THE DISEASE, AND DIFFICULTIES IN FAMILY DYNAMICS ARE OBSERVED, FURTHER COMPLICATING CLINICAL MANAGEMENT

» lopment of identity and personal autonomy. Nevertheless, there is currently a need to pay attention to younger ages, between 8 and 11 years.

T1DM treatment may significantly influence the development of EDs. Eating is conditioned by multiple external factors, such as glucose levels, insulin dose, and physical activity, which may interfere with internal hunger and satiety signals. In addition, the need for detailed carbohydrate monitoring may favor the development of rigid and obsessive behaviors. The overlap in the age of onset of T1DM and EDs increases the likelihood that both conditions will coexist.

DIABULIMIA

Among the EDs associated with T1D, **diabulimia** is particularly noteworthy and is characterized by intentional omission or reduction of insulin with the aim of losing weight. Pediatric endocrinologists Stuart Brink and Harold Starkman coined the term diabulimia in an article published in 1998. According to the DSM-5 and the 10th edition of the International Classification of Diseases (ICD-10), this condition is considered within "Other Specified Feeding or Eating Disorders," rather than as a separate entity, despite the serious consequences associated with these behaviors. Although there is no consensus regarding diagnostic criteria, in 2020 The Royal College of Psychiatrists of England

and Wales proposed the following 3: a) an intense fear of gaining weight and/or increasing insulin; b) restriction or omission of insulin administration and/or carbohydrate restriction; and c) the 2 previous criteria together with a significant impact on physical and mental health.

Of note, different studies show no solid evidence linking diabulimia with the use of diuretics, pills, or excessive physical exercise. Diabulimia requires early detection and a multidisciplinary approach because of the high risk of serious complications.

The main **risk factors for diabulimia** include female sex, a high BMI, elevated HbA1c, and poorer glycemic control, as well as rapid weight gain after diagnosis or initiation of insulin treatment.

At the psychological and emotional level, body dissatisfaction, diabetes distress, anxiety, and depression are variables associated with the development of EDs in people with T1DM. Similarly, the need for control, guilt, low self-efficacy, and self-regulation fatigue contribute both to the development and maintenance of these behaviors. In addition, diabulimia is also associated with late adolescence, a longer duration of diabetes, and low socioeconomic status.

At the family level, conflict, pressure regarding metabolic control, and negative

relationships with healthcare professionals act as aggravating factors.

By contrast, resilience has been identified as a protective factor that may reduce the risk of developing EDs.

Studies report that early detection of diabulimia is often difficult because it is frequently mistaken for poor adherence to T1DM treatment. The lack of specific clinical recognition and the absence of standardized protocols hinder diagnosis.

The most widely used screening tool is the DEPS questionnaire. Other adapted tools are also used, such as the EDI-3 for T1DM and the mSCOFF, a modification of the SCOFF questionnaire designed for people with diabulimia.

Regarding preventive interventions and strategies, different studies agree on the need for a multidisciplinary approach involving specialized professionals and integrating psychology, diabetology, and nutritional education. The most widely recommended interventions include psychoeducation programs at both individual and family levels, interventions based on cognitive dissonance and self-compassion. In addition, emphasis is placed on work related to body image, the progressive reintroduction of insulin to achieve therapeutic targets, and treatment of trauma and diabetes distress. **D**

RISK FACTORS		
METABOLIC AND CLINICAL FACTORS	PSYCHOLOGICAL AND EMOTIONAL FACTORS	FAMILY AND RELATIONAL FACTORS
High BMI or rapid weight gain after diagnosis or initiation of insulin treatment.	Body dissatisfaction and excessive concern about weight and body image.	Frequent family conflicts.
Elevated HbA1c.	Anxiety and depression.	Low socioeconomic status.
Poor glycemic control.	Need for control and fear of losing control of diabetes.	Excessive pressure regarding metabolic control.
Insulin manipulation.	Diabetes distress.	Family history of type 1 diabetes.
Longer duration of type 1 diabetes.	Self-regulation fatigue.	Family dynamics centered on weight or food control.
Presence of acute or chronic complications associated with type 1 diabetes.	Perfectionism and high self-demand.	Poor relationship with or lack of trust in healthcare professionals.
Multiple daily insulin injection regimens.	Low self-esteem and low self-efficacy.	Perceived lack of emotional support.
Female sex.	Previous adverse experiences.	

Main risk factors for diabulimia

CONCLUSIONS

EDs in patients with T1DM constitute a complex problem resulting from the interaction of biological, psychological, social, and disease treatment-related factors. Early detection, comprehensive assessment, and a multidisciplinary approach are essential to prevent complications and improve prognosis and quality of life in these patients.

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