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Eating disorders and diabetes: behavioural patterns and psychopathology. Two case reports

Disturbi dell'alimentazione e diabete: patterns comportamentali e psicopatologia. Due casi clinici

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SUMMARY. The relationship between eating disorders and diabetes is complex in terms of both reciprocity and comorbidity. In some cases, patients with eating disorders and diabetes develop 'purging' behaviours through the use of insulin as a bodyweight control tool, with serious physical complications that can compared to those of untreated diabetes (*diabulimia*). The clinical cases presented have in common the distorted use of insulin: one patient failed to take the required amounts of insulin, incurring hyperglycaemia, while the other overused it, incurring hypoglycaemia. From a psychopathological point of view, both patients were diagnosed with Borderline Personality Disorder. While these are just two case reports, it is our clinical experience that female diabetic patients with eating disorders who use insulin as a tool for weight control (*purging*) following binge eating should be assessed for borderline personality disorder in order to tailor a more effective therapeutic approach.

KEY WORDS: eating disorders, diabetes, psychopathology, diabulimia, insulin therapy, personality disorders.

RIASSUNTO. La relazione tra disturbi dell'alimentazione e diabete è complessa sia in termini di reciprocità che di comorbilità. In alcuni casi le pazienti con disturbi dell'alimentazione e diabete sviluppano dei comportamenti di controllo del peso corporeo (*purging*) attraverso l'utilizzo dell'insulina, con gravi complicanze organiche sovrapponibili a quelle del diabete non trattato (*diabulimia*). I casi clinici presentati hanno in comune il distorto utilizzo dell'insulina: in un caso non viene praticata la terapia insulinica, con conseguente iperglicemia; nell'altro caso viene praticata una dose di insulina in sovradosaggio, con conseguente ipoglicemia. Dal punto di vista psicopatologico, in entrambi i casi è stata posta diagnosi di disturbo borderline di personalità. Sebbene i casi clinici siano solo due, l'esperienza clinica suggerisce che per pazienti di sesso femminile con disturbi dell'alimentazione, diabete e utilizzo di insulina come strumento di purging a seguito di abbuffate sia importante una valutazione per verificare la presenza o meno di un disturbo di personalità borderline, affinché l'intervento terapeutico sia maggiormente efficace.

PAROLE CHIAVE: disturbi dell'alimentazione, diabete, psicopatologia, diabulimia, terapia insulinica, disturbi della personalità.

INTRODUCTION

Eating disorders, such as anorexia nervosa, bulimia nervosa, binge eating disorder and unspecified feeding or eating disorder, are described in the fifth editon of the Diagnostic and Statistical Manual (DSM-5) with the respective diagnostic criteria[1].

Although each of these categories has different diagnostic criteria, they share several clinical features, which include psychopathological traits and obsession with body shape and weight, as well as cognitive distortions, including altered body image. There is often comorbidity with depressive, anxiety and personality disorders[2].

If the altered eating behaviour symptoms do not meet the diagnostic criteria for eating disorders, they are identified as Disordered Eating Symptoms (DES), which include behaviours such as dieting to lose weight, compulsive eating habits, excessive exercise, use of diuretics and laxatives, and self-induced vomiting. These are behaviours that need careful evaluation and monitoring, as they may easily develop into a full-blown eating disorder.

The term 'diabulimia' (Eating Disorder-Diabetes Mellitus Type 1 - ED-DM1) is defined as a disorder of eating behaviour in patients, usually adolescents or young adults, predominantly female, with type 1 diabetes, who restrict their insulin use as a purging behaviour to lose weight[3]. This behaviour is associated with episodes of binge eating and disordered eating. Insulin restriction (by reducing, skipping or de-

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laying insulin doses) causes hyperglycaemia with loss of calories (glucose) in urine and consequent weight loss. The main objective of this, as of any 'purging' behaviours, is weight loss, which is achieved by restricting the use of a drug that the patient should take to control the organic disease[4,5].

Diabulimia is not currently given a specific diagnostic code in DSM-5; however, it is described in the literature. Moreover, due to its severe consequences for the young patients suffering from it, diabulimia has attracted considerable media attention and has even been described as «the world's most dangerous eating disorder»[6].

Some authors also emphasize the high prevalence of recourse to hypoglycaemia in patients with type 1 diabetes whose behaviour is characterised by binge eating and self-induced vomiting. In these patients, the voluntary self-administration of a higher dose of insulin than usual causes hypoglycaemia, which justifies the consumption of sweets and carbohydrates[7].

Moosavi et al.[8] have described a case of voluntary induction of hypoglycaemia aimed at reducing binge eating and craving.

Voluntary restriction of insulin in order to lose weight has serious consequences, both acute and long-term, similar to those of inadequately treated diabetes. Acute consequences consist basically of ketoacidosis crises, while long-term effects include classic complications affecting the kidneys, nervous system, cardiovascular system and retina. These patients, often women between 15 and 30 years old, with a marked misperception of their body and of the relationship between food and body weight, discover the anabolic properties of insulin very early on, as they notice the weight gain resulting from the treatment of their diabetes with this drug. Soon, they become 'obsessed' with weight loss and decide to progressively reduce their insulin doses; this exposes them to the complications listed above[6].

The relationship between eating disorders and diabetes is complex in terms of both reciprocal risk factors and comorbidity.

The two conditions operate as reciprocal risk factors, in both cognitive and behavioural terms.

On the one hand, diabetes may be a fertile ground for the development of eating disorders because of the need to follow a diet with strict dietary restrictions, requiring the limitation of certain types of food and a focusing of attention on food and calories[4,5]. This behaviour also stimulates a range of reactions, including feelings of guilt when dietary rules are not strictly adhered to, which are very similar to cognitive patterns in eating disorders[6].

Some studies have estimated a prevalence of eating disorders of about 10% in diabetic patients[6].

On the other hand, eating disorders may favour the onset of type 2 diabetes, due to dysregulated food intake and frequent binges that overwork the endocrine system.

A recent meta-analysis by Nieto-Martínez et al.[9] reported a significant increase in the risk of type 2 diabetes in patients with binge eating disorder and bulimia nervosa, while anorexia nervosa was not associated with risk reduction.

A case-control study by Colton et al.[10], which had recruited 101 girls aged 9-13 with type 1 diabetes reported omission of insulin doses in 2% of cases in the month prior to recruitment. This percentage is lower than the 5% found in young women by Birk and Spencer in 1987[11] and than the 14% reported in the 1985 Hudson et al.[12] study.

A number of studies have confirmed that living with type 1 diabetes is a risk factor for developing dysfunctional eating behaviour[13]. This risk has a gender component, as it is higher in girls and young women. Type 1 diabetes increases the risk of food dysregulation in particular in women, in association with other individual and socio-cultural risk factors, putting them at higher risk for eating disorders[13].

The comorbidity of eating disorders with diabetes has been studied for a number of years[14]. Early studies reported a high prevalence of eating disorders in type 1 diabetes patients[12,15]. However some issues were soon raised about the way the studies were conducted. The first concern related to the diagnosis of eating disorders, which has changed considerably across the various versions of the DSM. Secondly, the selection of control groups was not always accurate and did not always take into account possible differences in social and cultural background. The third weakness lied in the way in which the diagnosis was made, often through the use of self-administered scales that result in a wide margin of subjective diagnostic variability[14].

A review paper by Mannucci[16] included studies, which had overcome these shortcomings, on the prevalence of anorexia nervosa and bulimia nervosa in type 1 diabetic patients. A cumulative prevalence of anorexia nervosa and bulimia nervosa between 0% and 6% was reported in female patients. No studies reported a statistically significant prevalence of anorexia nervosa and bulimia nervosa in patients with type 1 diabetes compared to the control group. However, if only female patients are included in the analysis, a significant prevalence of bulimia nervosa is observed in patients with type 1 diabetes compared to controls. While this difference is not statistically significant, the same trend is also observed with regard to anorexia.

A number of studies have investigated the comorbidity between eating disorders and personality disorders, reporting a significant prevalence of personality disorders in patients with an eating disorder and, conversely, high rates of eating disorders in patients with personality disorders[17,18]. The reasons for the comorbidity between eating and personality disorders are many and complex. Dysfunctional personality traits may be risk factors for the onset and persistence of eating disorders[19,20]; significant malnutrition and weight loss can play a role in accentuating some personality traits[19]; in some cases, the co-presence of eating and personality disorders could be causal and share a common biological basis[21]. The studies have also shown that eating disorders are associated with specific clusters of personality disorders and personality traits. In particular, 'purging' patients have a greater association with Cluster C and B personality disorders and exhibit impulsive traits, unstable interpersonal relationships, behavioural and emotional instability, self-harming behaviour and substance abuse[17].

The aim of this report is to highlight an atypical mode of weight control by diabetic patients with borderline personality disorder and an eating disorder, through insulin misuse, the avoidance of diabetes check-ups and the failure to monitor blood glucose. The misuse of insulin seems to be part of a dynamic of 'easy' access to available weight control tools, without weighing the consequences of such behaviour, similarly to impulsive behaviours, without conscious suicidal intention.

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Two cases report of diabetic patients using insulin as atypical mode of weight control are reported below.

CASE REPORT 1

The patient, a young 25 year old woman, was referred to our centre by her general practitioner for an assessment of her binge-eating behaviour. At the first visit, the patient was found to be affected by depressive symptoms, including low mood, tiredness, apathy, anhedonia and binge-eating behaviour. The patient's ability to function in all areas of life was affected: she had dropped out of university studies, had no employment and had very limited social contacts. Her socio-economic background was good. She reported no past traumatic experiences. Her personal and family psychiatric history was negative. She had undergone no prior mental health treatment.

With regard to interpersonal functioning, we learned that her interpersonal relationships were chaotic and unstable. She practised self-harm (cuts and cigarette burns on the arms, inappropriate use of medicines). She reported impulsiveness and feelings of emptiness. The patient's clinical history and psychopathological presentation supported a diagnosis of borderline personality disorder.

Her medical history showed that she had been suffering from type 1 diabetes since she was 2 years old. Until the age of 17, her parents, in particular her mother, administered insulin therapy to the patient, with good results in controlling her blood glucose levels. Around the age of 18, the patient began to manage her insulin therapy and control her blood sugar levels independently. In the same period, the patient began to have excessive concerns about her weight and physical appearance. She discovered that by reducing her insulin doses, she was able to lose weight (by inducing glycosuria). The patient's attitude towards food was strongly influenced by her diabetes: she followed a strict diet and every time she strayed from her eating plan she felt she had been bingeing (even though she had not eaten large amounts of food) and she resorted to purging behaviour by omitting to take insulin. The patient had never perceived her failure to take insulin as a self-harming type of behaviour; rather she felt this practice gave her the 'power' to control her body weight. This cluster of symptoms, namely concern about weight and physical appearance, purging behaviour, excessive exercise with the intent to lose weight, supports the finding of an eating disorder, anorexia nervosa (AN). In light of the association with diabetes, the patient can be diagnosed as having diabulimia: a disorder of eating behaviour in which patients deliberately omit their dose of insulin in order to lose weight or to prevent weight gain. This 'purging' behaviour is also associated with episodes of binge eating and uncontrolled eating[3].

We administered questionnaires Minnesota Multiphasic Personality Inventory-2 (MMPI-2), Millon Clinical Multiaxial Inventory - Third Edition (MCMI-III) and Eating Disorder Inventory (EDI).

MMPI-2 scored high on subscales for Hypochondriasis 86, Hysteria 78, Paranoia 75, Depression 74 and Schizophrenia 67.

MCMI-III yielded high scores on subscales Histrionic 99; Narcissistic 90; Dependent 89 and Avoidant 85.

EDI gave high scores in the items that evaluate Drive for Thinness 15, Body Dissatisfaction 14 and Bulimia 12.

Depressive symptoms, especially tiredness and difficulty concentrating, are closely related to high blood glucose. The patient's blood glucose levels ranged from 350 to 450 mg/dL. Her HbA1c test result was 7.4%. She displayed a marked avoidance of blood glucose measurements and refused to undergo diabetes check-ups.

The response to antidepressants (fluoxetine 20 mg/die) was poor.

At the neurological examination, the patient was found to have peripheral neuropathy and alteration of the retina.

The patient was consequently included in a psychoeducational programme for eating disorders and was prescribed psychotherapy for borderline personality disorder. After 3 months, she dropped out of both interventions.

CASE REPORT 2

The patient, a 35 year old woman, was referred to us by her general practitioner for an assessment of her depressive symptoms. The symptoms recorded at the first visit included depressed mood, anhedonia, apathy and tiredness, associated with bingeing behaviour.

The clinical interview revealed a history of depressive symptoms linked to past traumatic events. The patient had been adopted at an early age, was sexually abused by a family member, and was bullied by peers during her school years. Although she had a good relationship with her adoptive family, she had not managed to shake off feelings of abandonment and neglect. No information about her biological family's medical history was available. No cases of mental disorders or suicides had been reported in her adoptive family. The patient had not undergone any previous psychiatric treatment. Her socioeconomic status was middle class. She had impaired function with respect to work and social life. Her depressed mood was accompanied by impulsive behaviour, frequent self-injury (with cuts on her arms, which she made with a razor blade) and pronounced emotional instability. The patient's functioning was impaired: she had discontinued her studies, was not in work, was supported financially by her family and had unstable and chaotic relationships.

She displayed a lack of acceptance of her body, excessive concern about her body weight, and an eating behaviour characterized by binge eating (3/7 times a week) and purging behaviour (self-induced vomiting, use of laxatives and diuretics). The patient had type 1 diabetes. She was 170 cm tall and weighed 120 kg.

She was administered the MMPI-2, MCMI-III and EDI questionnaires.

MMPI-2 yielded high scores on the subscales for Depression 80; Masculinity/Femininity 75; Psychopathic deviate 75; Paranoia 73 and Hysteria 72.

MCMI-III yielded high scores on the subscales Depressive 102; Masochist 99; Negativistic 90; Avoidant 89 and Dependent 86.

EDI scored high in the items for Ineffectiveness 16; Interpersonal distrust 14; Body dissatisfaction 14; Bulimia 14 and Drive for thinness 16.

She was diagnosed with borderline personality disorder in comorbidity with bulimia nervosa and type 1 diabetes.

The patient reported that she also used insulin as part of her purging behaviour: after a binge, she would take some additional units of insulin in order to eliminate the caloric intake introduced by bingeing. She had experienced some episodes of hypoglycaemia, which however had not required hospitalisation.

This patient too did not see her use of insulin as self-harming behaviour but as a way of controlling her body weight.

She refused antidepressant therapy and psychoeducational intervention addressing her eating behaviour. This behaviour, char-

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acterized by binge eating and purging persists to this day. She has started psychotherapy, which has led to an improvement in her mood, a reduction in self-harming and a reduction in the misuse of insulin. Her overall functioning remains compromised in the area of work.

DISCUSSION

The cases described in this paper are subject to the limitations of case reports.

However, they may provide some useful insights. The two patients described here understood that they could use insulin as a weapon to manage their dysregulated eating behaviour, and they believed that this could help them to control their body weight. Consequently, they responded to their binge eating episodes by misusing insulin. This had dramatic consequences for their body and organs. The first patient exposed herself to high and sustained blood sugar levels, which produced neurological and eye complications. The second patient underwent equally dangerous episodes of low blood glucose levels.

Their behavioural pattern also included avoidance of blood glucose monitoring and diabetes check-ups, resulting in total non-compliance with diabetes management.

Both patients have a complex psychopathological profile: their low mood may be considered a consequence of borderline personality disorder and above all of its relational and existential impacts. Their self-harming episodes occurred during bouts of anger; they seemed to have a soothing effect on anger, and they were not reported as being done with suicidal intent. These patients see their misuse of insulin as a valid tool for weight control, despite the high risks and health impacts of this practice.

The misuse of insulin and the lack of/incorrect compliance with diabetes management requirements (the avoidance of diabetes check-ups, the refusal to monitor insulin treatment, the rejection of nutritional advice) may be linked to the broader and more complex dimension of indirect self-destructive behaviour already described back in 1938 by Menninger[22]. This dimension, which has also been developed by other scholars, describes a wide range of actions and omissions by individuals within the complex and ambivalent relationship that we all have with death and with the life instinct. Please refer to the literature for an in-depth examination of this subject, which falls outside the scope of this paper[23].

CONCLUSIONS

The description of these two clinical cases is useful for diabetologists, psychiatrists and patients with eating disorders and diabetes.

For the diabetologist it is important to know that a patient's hyperglycaemia and hypoglycaemia (which may be very puzzling) might in fact stem from non-compliance, a problem that is well-known to these doctors; in addition, it is useful for them to know that non-compliance with diabetes treatment may be linked to an eating disorder or eating dysregulation; lastly, in some patients, hyperglycaemia and hypoglycaemia can be linked to the voluntary misuse of insulin in order to control their body weight.

For psychiatrists, it is important to be aware of the existence of atypical eating disorders, in which purging behaviours are linked to an organic disease and, most importantly, to the treatment prescribed for the organic disease. Thanks to the skills acquired in manipulating the drug, and knowledge of its mechanism of action, these patients may attempt to control their body weight.

For patients, especially female patients, it is important to know that certain behaviours are linked to an eating disorder and not simply to poor compliance with diabetes treatment; they constitute 'purging' behaviours that indicate an eating disorder when associated with the cluster of symptoms, behaviours and cognitive patterns of those disorders.

Such insight should be the starting point for a cognitive-behavioural therapy aimed at food re-education, body image acceptance and cognitive restructuring to remove the many cognitive distortions present.

In the light of the two cases presented, we suggest that diabetic patients presenting a concurring eating disorder, with poor compliance with insulin treatment, should be assessed for their personality profile in order to exclude or diagnose a borderline personality disorder and offer them a targeted therapy that can help both their mental and their physical health[24].

Although cognitive behavioural therapy has been reported to be beneficial[25], there is no consensus to date on its specific effectiveness in the treatment of diabulimia[26]. The number of studies investigating this condition is still too small to enable a critical assessment of the effectiveness of these approaches[4]. Therefore, further studies are necessary.

Conflict of interests: the authors have no conflict of interests to declare.

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