Diabulimia - The phenomenology of an under recognised juxtaposition between diabetes and eating disorders

Suhas Chandran[1], Prakrithi S N[2], Supriya Mathur[3], Kishor M[4,*]

[1,3]Junior Resident, [2]Intern. Resident, [4]Associate Professor, Dept. of Psychiatry, JSS Medical College and Hospital, JSS University, Mysuru, Karnataka, India

***Corresponding Author:**
Email: drkishorm@gmail.com

Abstract

Eating disorders are a major cause of physical and psychological morbidity. Young women and adolescents with diabetes, especially Type 1 Diabetes Mellitus (T1DM) are at a high risk for developing disordered eating behaviours (DEB) and eating disorders (EDs). A similar DEB that often goes unrecognized is "Diabulimia" i.e. deliberate administration of insufficient insulin or omission of insulin administration for the purpose of weight loss. Such manipulation provides an easy way to control weight as compared to other means like exercise or diet control, but in turn leads to poorer metabolic control and contributes to an increased risk of short-term and long-term diabetes related medical complications, ultimately leading to higher mortality rates. Despite its several clinical implications, diabulimia is not yet considered either a formal medical or a psychiatric diagnosis. Early detection and treatment can effectively reduce adverse physical and psychological health outcomes. Treatment strategies like pharmacotherapy, psychotherapy or a combination of both can be helpful in such cases.

Keywords: Diabulimia, Adolescents, Young women, Diabetes, Eating disorders.

Introduction

The choice of type and quantity of food is vital to achieving and maintaining a state of normoglycaemia in diabetes, especially in case of Type 1 Diabetes Mellitus (T1DM). Individuals with TIDM more often than not, calculate and keep track of every bite they consume, due to the need to balance their food intake with insulin administration. This attention to detail could however reach a level of obsession akin to that of an eating disorder and thereby have a negative impact on optimal glycaemic control. Eating disorders by themselves, are a major cause of physical and psychological morbidity in adolescents and young women. It has been found that patients with T1DM are at a high risk for developing disordered eating behaviours (DEB) and eating disorders (EDs)[1] and the prevalence, clinical characteristics and medical consequences of this combination has received increasing attention since case reports of the same were first published in the 1980s. Although the specificity of this association was initially unclear, recent studies suggest that young women with TIDM have 2.4 times more risk of developing an eating disorder than age-matched women without diabetes.[2]

Eating disorders, according to the Diagnostic and Statistical Manual-5 (DSM-5), are classified as Anorexia Nervosa, Bulimia Nervosa and Eating Disorder Not Otherwise Specified.[3] In these patients, there is an obsession with body shape and weight, with cognitive distortions such as alteration in body image, which leads to the development of DEBs. DEBs include a lot of ED patterns at a frequency or severity that do not merit a formal ED diagnosis. Such DEBs include dieting, fasting, binge-eating, and a range of compensatory and purging behaviours which, in individuals with T1DM can directly interfere with optimal management. A similar DEB that often goes unrecognized is the phenomenon of "Diabulimia". Diabulimia is a term used to describe the deliberate administration of insufficient insulin or omission of insulin administration for the purpose of causing weight loss, i.e., deliberately manipulating the prescribed dosage of insulin to control body weight. An article published in 1998 states that the term diabulimia was coined by pediatric endocrinologists Stuart Brink and Harold Starkman.[4] Diabulimia is a principal intermediary between DEBs and poor metabolic control and contribute to an increased risk of a range of short-term and long-term diabetes related medical complications.[5-7] These include abnormal lipid profiles, diabetic ketoacidosis, retinopathy, neuropathy, nephropathy and lastly, higher than expected mortality rates.[8,9] Despite its several clinical implications, diabulimia is not yet considered either a formal medical or a psychiatric diagnosis according to the DSM – 5 or the ICD 10-CM. The condition was included under Eating Disorder Not Otherwise Specified in DSM-IV and now is classified under Other Specified Feeding and Eating Disorders (OSFED) according to DSM-5. DSM-5 also mentions insulin restriction or omission in bulimia nervosa, where it is regarded as a form of 'purging' the body of excessive glucose. As DEBs are investigated in several studies involving diabetics, they are included in our review even though DSM-5 has not allocated separate categories to DEBs.

Incidence

There have been numerous studies on EDs in diabetes mellitus. Hudson, et al reported bulimia to be

more commonly prevalent ED than anorexia in IDDM (insulin dependent diabetes mellitus) patients.[10] A meta-analysis reported that the prevalence of anorexia was not much different in IDDM and non-IDDM patients, but the prevalence of bulimia nervosa and eating disorder –not otherwise specified was significantly higher in IDDM patients compared to their non diabetic counterparts.[11] Contradicting this, another study concluded that there was no evidence to suggest that the EDs were more prevalent in IDDM women than in non diabetic women, but also reported that disordered eating behaviour with poor glycaemic control, in addition to manipulating insulin to influence body weight was common in young women with diabetes.[12]

Diabulimia, being a relatively unknown disease phenomenon, is quite often overlooked by the clinicians and is grossly under reported. It is only recently that parallels are being drawn between diabetes and the increased incidence and prevalence of eating disorders among diabetics. With increasing awareness, research into this phenomenon has proportionately increased and a number of studies and case reports have been published in recent times. These studies reveal that the prevalence of diabulimia is found to be more in adolescent girls and young women.[2]

Risk Factors

The most commonly implicated patient group for the high prevalence of DEBs by far seems to be the adolescents. During adolescence, there is already a struggle with body image/ body satisfaction due to peer pressure, the socio-cultural preference for thinness and the need to have the 'ideal' body type according to social media and multitudes of other online platforms. In cases of T1DM, this is further complicated due to the awareness these patients need to have about their diet and weight fluctuations for the purpose of maintaining regular glycaemic control,[13] meaning that T1DM patients have a higher risk for developing DEBs. One of the most important reasons for adolescents developing diabulimia seems to be the peri-pubertal changes in body shape and weight and the psychological and behavioural changes which occur during puberty. These physiological pubertal changes, in turn predispose adolescents to develop unhealthy eating habits.[14] A review article on psychological aspects of T1DM in children and adolescents notes that the problems with adherence to treatment in T1DM patients peaks in adolescence. This is due to the individual engaging in experimentation, rebellion and risk taking during the course of normal adolescent development, resulting in non-adherence and impaired metabolic control.[15] Some of the other reasons implicated in causing individuals to meddle with their insulin dosages are increasing body weight after starting insulin therapy[16] and dissatisfaction with body image.[17] In addition, social factors like poor support systems and dyscohesive families have also been found to increase the risk of developing disordered eating behaviours.[18] According to a study conducted by Markowitz et al, individuals who were classified by their clinicians as missing or restricting insulin doses scored higher on the DEPS-R scale (Diabetes Eating Problem Survey–Revised) and had less optimal glycaemic control than those who did not restrict insulin.[19] This indicated that, amongst the individuals with diabetes, the diabulimics had a higher risk of developing DEBs than their non diabulimic counterparts, further underlining the association between diabulimia and the presence of additional eating disorders in these patients.

Pathophysiology

Most individuals, incidentally or through the internet, find that insulin manipulation provides an easy way to reduce or stop gaining further weight as compared to other means like physical exercise or diet control. This makes the use of this method very appealing to them, resulting in the development of diabulimia in these patients. The attention patients with diabetes mellitus must pay to diet and weight put them at an increased risk of developing eating disorders. This, in turn predisposes them to develop complications associated with persistent hyperglycaemia, which occur consequent to insufficient insulin administration. This compromised metabolism causes the precipitation of acute complications like diabetic ketoacidosis and chronic complications like peripheral neuropathy, nephropathy, retinopathy, peripheral vascular disease and atherosclerosis far sooner in these patients than in the ones with better glycaemic control.[20] Hyperglycaemia also causes abnormal immune responses like increased risk of infections and abnormally increased inflammation. Studies have shown that there is a strong correlation between insulin restriction and development of chronic micro and macrovascular complications in IDDM patients with associated eating disorders.[5-7] Peveler et al conducted a study in adolescent and young women with T1DM by assessing them at ages 11-25 years, with reassessment 8-12 years later, at ages 20-38 years. They found EDs to be present in 26% and insulin misuse for weight control in 35.6% of the subjects. The study showed significant relationships between DEBs, insulin misuse and microvascular complications, with overall outcome being poor in diabulimics, who showed serious microvascular complications and a high mortality rate.[21] According to Klien et al, the glycosylated haemoglobin level was strongly related to the incidence or the progression, or both, of diabetic retinopathy, the incidence of gross proteinuria and the incidence of peripheral neuropathy, indicated by the loss of tactile sensation or temperature sensitivity in persons with either insulin dependent or non insulin dependent diabetes mellitus.[6] Takii et al reported that retinopathy and nephropathy increased with the duration of severe insulin omission and the duration of T1DM.[5] A study conducted among young women with T1DM reported

that around 34% of study subjects used insulin to reduce weight and 33% showed DEBs, with higher HBa1c levels and increased incidence of retinopathy in patients with DEBs, signifying impaired metabolic control and a higher risk of diabetic retinopathy.[8] Polonsky et al also reported that 31% of study subjects (young women with T1DM) reported insulin omission, with the omitters reporting more DEB, greater psychological distress, poorer glycemic control, increased DM related hospitalisations, with higher retinopathy and nephropathy.[22]

The Clinical Picture and Diagnosis

The high risk of developing complications in these patients makes it extremely important in regular clinical practice to identify the warning signs of insulin manipulation and persistent hyperglycaemia, as these patients consult a physician for the effects of diabulimia rather than the diabulimia itself. Physicians often fail to recognise diabulimia, possibly because it is not yet a widely known or conspicuous enough condition to warrant suspicion in the first place. This can only be remedied by the clinician consciously looking for the clues which might point to its presence in diabetic patients. The psychiatrist must also be able to identify diabulimia as the patient can present with other co-morbid psychiatric symptoms like other eating disorders, anxiety and depression, for which the patient may visit the psychiatrist. Thus it becomes important for the physician or endocrinologist as well as the psychiatrist to identify the condition and ensure prompt management. Sudden weight loss, disordered eating habits, lethargy, weakness, increased frequency of micturition, multiple episodes of unexplained hyperglycemia, impaired glycemic control, ketone smell in breath and urine, a tendency to obsess or worry about body shape and size; these are some of the symptoms and signs seen in an IDDM patient, which can be used as pointers to make the diagnosis of diabulimia, especially so, when the patients in question are adolescents and young women.[23] The warning signs of a severely progressed disease which justify the requirement of immediate medical attention include persistently high HbA1c levels, frequent visits to the emergency department and hospital admissions for diabetic ketoacidotic episodes, increased frequency of micturition with repeated UTIs, menstrual abnormalities and an increased drive for thinness coupled with body dissatisfaction and cognitive distortions. Indeed, an eleven-year follow-up study reported that insulin restriction conveyed more than a three-fold increased risk of mortality after controlling for age, HbA1c and body mass index.[9] Hence, any IDDM patient exhibiting these signs should be mandatorily questioned about their insulin administration practices. Considering the implications, it is of paramount importance that the treating health care professional identifies diabulimia as early as possible and takes immediate steps for treatment and referral for further counselling. The DEPS-R scale, proposed by Markowitz et al can be utilised to this effect, for the screening of DEBs in high risk groups, especially adolescents and young women with T1DM to detect diabulimia sooner and institute early treatment.[19]

That being said, there is always a possibility that restricting insulin may not be solely for the purpose of maintaining body weight. There may also be other reasons like injection related anxiety (needle phobia), mood disorders, anxiety about becoming hypoglycaemic, social barriers (for example, financial constraints which hamper the ability of the patient to use insulin regularly) and others.[24] It goes without saying, of course, that these possibilities need to be kept in mind, questioned about and explored before making the final diagnosis of diabulimia.

Treatment

In current practices, the treatment of diabulimia is similar to treatment methods used for other eating disorders, with the difference of the added diabetes management. Treatment options include pharmacotherapy or psychotherapy or a combination of both.

Cognitive behavioural therapy, interpersonal psychotherapy and dialectical behavioural therapy are various forms of non pharmacological treatment methods which may be attempted. Psychotherapy can be administered as individual or group or as a family based therapy. Family psychotherapy can help in alleviating the difficulty of both the individual and family members of coming to terms with having a chronic disease which requires constant care and attention. According to a study, family based therapy gave better results than individual psychotherapy.[25] Peveler et al reported that modified CBT in patients with bulimia and T1DM resulted in improvement in both eating habits and glycaemic control.[26] Ramirez et al reported a case of bulimia with T1DM, who was successfully treated with fluoxetine, which results in improvement in comorbid depression and also cessation of binging and purging behaviours, with additional improvement in metabolic control.[27] A study conducted by Peveler et al reported the successful treatment of a case of anorexia and diabetes using modified CBT, which included self monitoring of behaviours related to diabetes management and glycaemic control, with cognitive restructuring techniques for addressing diabetes related thoughts.[28] Fairburn et al. showed that CBT or focal IPT had better long term outcome in the treatment of bulimia nervosa compared to behaviour therapy, which had a short lived effect.[29] A study conducted by Agras et al. in 2000 reported that CBT showed faster improvement in patients of bulimia nervosa than IPT and suggested that CBT should be preferred for the treatment of bulimia.[30] Pharmacological methods like anti-depressant medications may be tried in combination with non-pharmacological methods or individually. Consequently,

CBT alone gives much better results than pharmacotherapy alone, and is comparable to the outcomes given by combination therapy.[31] A study conducted by Custal et al to find out the difference in treatment outcomes in case of patients with EDs associated with IDDM and patients with ED alone revealed that there were higher drop-out rates and worse clinical outcomes in the former group, with around three-quarters of ED-alone group reporting improvement after CBT in contrast to about 50% of the ED+IDDM group, indicating the increased difficulty of successfully treating diabetics with co-morbid eating disorders.[32] The effectiveness of these modified treatment methods for diabulimia need to be investigated further with RCTs for conclusive evidence.

The medical complexity caused by diabetes and co-morbid eating disorders necessitate more medical supervision for these patients than patients with diabetes alone. These patients might require inpatient treatment under both medical and psychiatric units until they are medically stable enough to engage in regular outpatient care and management. Monthly appointments with the diabetologist and the nutritionist may be necessary, along with laboratory tests (especially HbA1c and electrolytes) and weight measurements. A multidisciplinary approach, involving the endocrinologist, nutritionist, psychiatrist and the clinical psychologist for the treatment of these individuals can help improve overall outcome. The endocrinologist is necessary for the control of diabetes and maintenance of metabolic control and treatment of diabetic complications. The nutritionist may help in planning the daily diet and insulin dosage variation with diets and help to maintain normoglycaemia. They may also be helpful in identifying and treating the associated dietary vitamin and other nutrient deficiencies which are common in patients with eating disorders. The clinical psychologist provides the psychotherapy for treating the EDs and DEBs, with the psychiatrist responsible for the pharmacotherapy which is necessary for the treatment of co-morbid anxiety or depression or other psychiatric issues, if present.

Prevention Strategies

A study conducted by Stewart et al showed that subjects who had rigid diet control strategies reported symptoms of EDs, mood disturbances and excessive concern with body size, compared to individuals with flexible strategies, who did not exhibit the above mentioned symptoms. Thus, adopting a less intensive regimen for diabetes control can help prevent the development of DEBs, especially in adolescents and young women.[33] Screening and prevention programmes for this high risk group should begin in the preteen years itself, which can be brought about by training health care professionals in schools to identify the clinical features and warning signs of persistent hyperglycaemia in order to identify and treat patients sooner. Awareness and information about diabulimia should be included in the health education curriculum, which will prevent youngsters from following the same behaviour.[34]

Conclusion

Eating disorders coupled with diabetes represent some of the most complex patient problems to treat both medically and psychologically. The identification of an emerging problem such as diabulimia is of utmost importance as early detection and treatment can effectively reduce the adverse health outcomes, both physical and psychological. It is therefore necessary to train health professionals regarding the diagnosis and early referral to the psychiatrist so that a combined approach may be adopted, which includes medical treatment of complications and also counselling and correction of cognitive distortions associated with negative body image, which can be implemented simultaneously. In summary, the condition can be successfully treated using a multimodal approach, with the endocrinologist for diabetic control, a nutritionist for diet counselling and the psychologist and psychiatrist for psychotherapy and pharmacotherapy, thereby addressing all aspects of the disorder. On the whole, early referral and a trusting relationship between patients and their treating doctors is necessary for a satisfactory and successful treatment of all medical and psychological aspects of this condition, leading to better treatment efficacy and overall improvement in the condition of the patient.

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