

A Case of a 13 Year-Old Female with Eating Disorder, Insulin Dependent Diabetes Mellitus and Major Depression: Abroad Review of the Literature

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Introduction

Eating disorder not otherwise specified (EDNOS), with insulin dependent diabetes mellitus (IDDM), and major depressive disorder (MDD) in a 13 year old patient can be very complicated and in this case report we define the need for multidimensional approach with integrative behavioral methods towards the treatment of this subgroup of patients. According to the Diagnostic and Statistical Manual of Mental Disorders, [1] major depressive disorder is defined as a depressed mood or a loss of interest or pleasure in daily activities. Five or more of the following symptoms must be present over the course of more than two weeks: depressed mood or irritable most of the day, decreased interest or pleasure in most activities, significant weight change or change in appetite, change in sleep (insomnia or hypersomnia), psychomotor agitation or retardation, loss of energy, feelings of worthlessness or inappropriate guilt, inability to concentrate, or thoughts of suicidality.

The DSM IV also defines eating disorder not otherwise specified as not meeting the specific criteria for Anorexia Nervosa or Bulimia Nervosa, due to the presence of menses, maintenance of normal weight, purging small amounts of food, or chewing and spitting food out.

According to the American Diabetes Association (ADA)[2], insulin-dependent diabetes, type I diabetes, or juvenile-onset diabetes, results from a cellular-mediated autoimmune destruction of the β -cells of the pancreas. This results in a loss of production and release of insulin from the pancreas. Symptoms include marked hyperglycemia, polyuria, polydipsia, weight loss, sometimes with polyphagia, and blurred vision. Furthermore, some patients, particularly children and adolescents, may present with ketoacidosis as the first manifestation of the disease.

Objective

The significance of this case report is to find out what is the best treatment option for an adolescent female patient who has IDDM, MDD, and EDNOS, with this extensively damaging of a past history.

Methods

A literature search via Pubmed, UPTODATE, and a Google search has been conducted on adolescence associated with eating disorders, major depressive disorders, diabetes mellitus, as well as etiology and incidence of these conditions. Case reports were also researched with similar clinical presentations.

Case Report

Consent was obtained from the patient's mother for an educational journal publication on her daughter's history and treatment. A 13-year-old Hispanic American female was referred to our hospital in February 2014 due to self mutilatory behavior by cutting her wrists after an argument at her home. She has a history of two previous psychiatric inpatient hospitalizations, most recently discharged in January 2014, and both of which were related to major depression and cutting behavior. The patient's mother was helpful in obtaining the collateral information and a detailed birth and past history. The patient is a current eighth grade student who lives at home with her mother and 2 older brothers, ages 15 and 19. On the day of presentation for this incident, she was brought in by the Police Department for evaluation of cuts on her wrists due to self-mutilating behavior. Upon evaluation in the Emergency Department the patient reported "I had an argument with my brother and then I cut myself." She reported that she self-restricted her eating habits, and earlier that morning on the way to school, she took her lunch and threw it out as she left the house, her brother saw her throw it away and they got into an argument. The patient then went into the bathroom and locked the door and made several 3-4 cm superficial cuts horizontally on her wrists. She reported no suicidal intent but to relieve anxiety, and stated that she just did it as a release of her anger. She was evaluated by the emergency department physician and her wounds were treated. She was cleared medically and evaluated psychiatrically. The patient denied any current auditory or visual hallucinations, and she denies any suicidal or homicidal ideations. She admitted to feelings of depression, hopelessness, and worthlessness. She denied any symptoms of anxiety, or mania. Due to her unpredictable behavior patient's mother voluntarily admitted the patient into the hospital for further evaluation, treatment, and monitoring. The patient was then transferred to the inpatient child psychiatric unit.

Past history revealed that the patient was diagnosed with insulin dependent diabetes mellitus (IDDM) at the age of 7, and major depressive disorder, recurrent, severe with psychotic features, and post-traumatic stress disorder, chronic type at the age of 11. The patient has a history of two previous inpatient psychiatric hospitalizations in October 2013 and January 2014. She was subsequently discharged in January 2014 after spending 5 days on the unit. She was discharged and was compliant with bi-weekly therapy with a counselor as well as bi-monthly follow-up appointments with an outpatient psychiatrist. She denied any suicidal or homicidal ideation, and she had no history of any previous suicidal attempts. She had no past history of aggressive or assaultive behavior or any legal charges. She had a documented past history of self mutilatory cutting behavior as a coping mechanism. On further evaluation of her family history, the patient was previously kidnapped by her father from the ages of 2-11. The father reportedly

moved from state to state for 3 years to avoid being caught. During this time, the patient passed out in school and was taken to the hospital and diagnosed with insulin dependent diabetes mellitus. The patient's father was not compliant with her insulin and her blood glucose levels, and was reportedly selling the patient's insulin needles for drug money. The father physically and abused the patient during this time, including telling her that the mother gave her up and did not want her, and he also would hit her with a belt. The father took the patient to drug deals with him, and she also reported an instance of physical and sexual abuse by one of her father's adult friends at the age of 6. Eventually the patient passed out again at school due to poor management of her diabetes at the age of 11, which led to an open investigation into the patient's father of child abuse and neglect. The patient was then found as missing and was returned to the mother at the age of 11. The patient had no past history of self-restricting her diet or an eating disorder. She also had no past history of destruction to property, cruelty to animals, or any fire setting behavior. Mental status examination revealed a soft spoken, cooperative, and fairly kempt 13-year-old female of Hispanic descent. She was dressed casually with drawings on her arms related to music, which she stated is a coping mechanism to relieve stress. She had multiple old scars bilaterally extending from her wrists superiorly on her forearms to her elbows from previous episodes of self-mutilation, and she currently had bandages on her arm from the emergency department physician. Vital signs were all within normal limits. Laboratory tests revealed a normal CBC, TSH, fT4. CMP revealed a blood glucose level of 370, and serum B12 was normal.

The patient was diagnosed with insulin dependent diabetes mellitus (IDDM) at the age of 7. She was diagnosed with major depressive disorder (MDD), recurrent, severe, without psychotic features, and post-traumatic stress disorder (PTSD), chronic type at the age of 11 after undergoing counseling after being returned to her mother. The patient was diagnosed with eating disorder not otherwise specified (EDNOS) at the time of this admission. The patient has been previously controlled on an insulin pump, however on the inpatient psychiatric unit, she was changed to subcutaneous insulin, based on the sliding scale with finger stick blood glucose measurements every three hours. After consult with the patient's endocrinologist, this was decided due to her sporadic periods of restricting and purging. Treatment included individual, milieu, group and pharmacotherapy. Medications on admission are: Prozac 10mg orally once-a-day, Hydroxyzine 50mg every 6 hours as needed, Novalog sliding scale with finger stick every 3 hours.

After following the patient during the inpatient hospitalization she started to become stabilized. She was slowly increased to Prozac 30mg daily, and her mood had slowly improved. The patient still experienced mood lability, from happy, to depressed, to angry. She originally had sporadic moments where she would eat a small meal, and then attempt to purge, or she will eat and then deny herself food for the next three meals. She reported feeling depressed often in the unit when she was first admitted, but those feelings had slowly decreased with her psychotherapy and pharmacotherapy and patient was discharged in a stable condition, with follow-up referral to outpatient psychiatrist for further treatment.

Discussion

One of the important questions in this case is: what is the best treatment option for an adolescent female patient who has IDDM,

MDD, PTSD, and EDNOS, with this extensively damaging of a past history?

Depression is often under or undiagnosed in the adolescent population [3]. Patient education is often very important in successful treatment. National Collaborating Centre for Mental 2005 found that the patient must not only understand their symptoms of the disease, but also their own individualized treatment plan. This can help to decrease the social stigma of the diagnosis, and can show the importance of staying compliant with their treatment. Our patient was diagnosed with MDD at the age of 11, when she was returned to her mother. She proceeded to undergo therapy which did not decrease her symptoms. The better treatment option she would have benefitted from, was psychotherapy in conjunction with a selective serotonin reuptake inhibitor (SSRI) as evidenced in the literature [4]. The Treatment for Adolescents with Depression Study (TADS) used the Children's Depression Rating Scale-Revised (CDRS-R) and a dichotomized Clinical Global Impression improvement (CGI-I) to rate a child's depression with different treatment options. The scores were compared with multiple treatments that included Fluoxetine, cognitive behavioral therapy (CBT), and Fluoxetine and CBT together. The study found that Fluoxetine and CBT showed the best short and long-term outcomes [4]. Another study, the Treatment of Resistant Depression in Adolescents (TORDIA) was initiated in 2001 to determine how to best treat the 40 percent of adolescents with MDD whose depressive symptoms do not respond to the first selective serotonin reuptake inhibitor (SSRI) they have tried. Results showed that adding CBT, if not already added, and/or switching to a different SSRI showed a greater response to treatment. It also showed that switching to Venlafaxine had an equivalent outcome to switching to another SSRI, but the patients generally experienced more side effects [5]. Furthermore, [6] suggested reviewing the level of depression with the Children's Depression Inventory (CDI), and then continuously monitoring it with current data and interpretation.

The patient was diagnosed with IDDM at the age of 7 while still under the father's care, after passing out in school and being taken to a hospital. During the first few years following her diagnosis, the patient's blood glucose levels were not properly maintained. The second instance of her passing out in school led to her ultimate discovery by the authorities who were looking for her [7] found that first step in the proper treatment of her IDDM education about the disease. Individual, patient, and family education about the illness, its treatment, comorbidities, symptoms and long term complications of uncontrolled blood glucose levels, was instrumental in achieving a good prognosis over the course of the patient's life. They found that blood glucose monitoring at least four times a day was important. Then, using glucose levels to make insulin dose adjustments acutely for rapid- or short-acting insulin and after observing patterns over several days to adjust doses of long-acting insulin. They also recommend to use insulin-to-carbohydrate ratios of meals and correction doses for high and low blood glucose levels was needed. Furthermore, periodically testing postprandial, before-and-after exercise, and nocturnal glucose levels was recommended. Silverstein also found that nutritional planning is also very important for proper maintenance of blood glucose levels. Education about carbohydrate, protein, and fat contents of certain foods, and effects of each on individual blood glucose is also needed to determine pre-prandial insulin dosages. Education on exercise, and its effects on blood glucose is also very important to maintain proper levels.

Lastly, pharmacotherapy is needed to properly maintain the correct blood glucose levels. In a statement from the American Diabetes Association (ADA) and the European Society for Pediatric Endocrinology, Fisher, 2006 found that they recommend that insulin pump therapy should be considered for patients with one or more of the following characteristics: Recurrent severe hypoglycemia; wide fluctuations in blood glucose levels (regardless of glycated hemoglobin [HbA1C]); suboptimal diabetes control (HbA1C exceeds target range for age); microvascular complications and/or risk factors for macrovascular complications; good metabolic control, but insulin regimen that compromises lifestyle. When it comes to the type of insulin to put in the insulin pump [8], found that continuous subcutaneous insulin infusion (CSII) aka insulin pump, is best used with insulin lispro. A basal rate of insulin is supplied continuously and bolus doses can be given before meals. Subcutaneous catheter needs to be changed at 2-3 day intervals. Also, a CSII can be augmented by a continuous blood glucose monitor (CBG) which will then automatically pause the pump during periods of hypoglycemia. If the CSII is unavailable or not an option for treatment, intensive insulin therapy injections consisting of a basal and bolus insulin injection is recommended in conjunction with frequent blood glucose monitoring. Furthermore [9], the ADA recommended measurement of HbA1c for type 1 patients 3-4 times per year to determine good metabolic control and glycemic control within the target range.

Our patient also suffered from Eating Disorder NOS. Basic inpatient treatment of supervised meals to help in the motivation to eat and prevention of refeeding syndrome (Foreman, 2014) were recommended. Rapid refeeding can cause severe or life threatening fluid and electrolyte shifts, therefore close monitoring of eating habits and meals is needed, as well as restricting access to the bathroom post meals to prevent purging [10] recommended cognitive behavioral therapy to help the patient to focus on the thoughts and beliefs about body weight and shape and specifics of denying one's self of food. Also [11] found that CBT was successful for long term treatment of eating disorders without regard to depression [12]. Found that motivational interviewing with the patient can help them to slowly gain weight. This study found that focusing on gaining weight to achieve goals, and make future plans are helpful for long term stability [13] found that family based treatment was more successful compared to individual treatment. They also found that further investigations are needed beyond just the treatment efficacy [14] found that including the family in therapy had a more favorable outcome for treatment of adolescent girls with depression and an eating disorder [15] found that adolescents with a history of childhood sexual abuse and an eating disorder, similar to our patient, resulted in a lower level of self-esteem and a higher level of depression than with just an eating disorder alone. Lastly [16] found that the effects of exercise on self-esteem, depression, mood and body image can reduce the risk of eating pathologies.

Some small studies show that Olanzapine may be beneficial in helping adult patients gain weight [17], however a further review and literature search has shown that the research for pharmacotherapy as treatment for an eating disorder specifically for adolescents is still lacking [18] also found that there is a lack evidence for use of antidepressants to treat an eating disorder alone, however in the case of our patient, it was helpful to treat her MDD thereby helping to improve her overall condition.

A review of and search of the literature for IDDM, MDD, and an ED reveals a plethora of research on individual conditions, and some articles linking an increased incidence of these conditions in

adolescent teenagers. However, there is a very large gap in medical and psychiatric treatment of patients with each of these conditions together. This paper shows a detailed review of the literature that can help to close this gap for this unique presentation. Further research, including clinical trials on a larger scale are still needed to be able to show definitive proof of effective treatment that has been proposed here. Demographic and clinical characteristics by eating status can be seen in the table below. Harm avoidance and self-directedness were significant predictor variables in the adolescents with a sub threshold eating problem vs. those without an eating disorder.

Conclusion

Our patient has a very extensive past history that created a difficult group of illnesses to treat in this adolescent female. These three separate illnesses are each difficult to treat alone. Adding them all together compounds the treatment difficulty.

After reviewing the literature, we found that the best recommended treatments for this patient is as follows:

1. Treat the patient's major depressive disorder with intensive CBT combined with Fluoxetine [4] and group therapy [19], with CDI monitoring [6].
2. Treat the eating disorder with CBT [10], group and family therapy [13,14] and exercise therapy [16].
3. Treat the insulin dependent diabetes mellitus with CSII and CGM [20] with nutritional planning [7], and HbA1c testing according to the ADA schedule.

It is our recommendation for each of these therapies to be performed to achieve the maximum effectiveness of treatment to recover and self-heal from these illnesses. This is the best research found to treat this unique patient with serious medical and psychiatric conditions, however further research is still warranted. Standardized Temperament Score Variations by Eating Status and Two Literature Control Samples.

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