



## Suicide Risk in Adolescents with Diabetes: A Case Report

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### Abstract

Adolescents with Diabetes Mellitus Type I are at risk for depression and suicide, particularly suicide via insulin injection. A case presentation is used to examine the suicide attempt via insulin injection of an adolescent female with diabetes. The case is discussed, emphasizing the importance of screening for suicidal ideation, monitoring adolescents with diabetes and comorbid suicide-related thoughts and behaviors carefully, and addressing insulin management in safety planning procedures with these adolescents and their families.

**Keywords:** Adolescent; Suicide; Diabetes

### Background

Adolescent suicide is an international public health problem and a medical priority [1]. Suicide recently advanced to the second leading cause of death among 15-29 year olds worldwide [2]. While the prevalence of depressed mood among youth with diabetes is similar to that of published estimates of depressed mood among youth without diabetes [3], there is some evidence suggesting that patients with diabetes may be at a higher risk for suicide related thoughts [4] and behaviors [5]. Some studies suggest that suicidal ideation is more common among adolescents with diabetes than adolescents without the diagnosis, with the rate of suicidal ideation ranging from 15-27% [4,6-8] and suicide attempts ranging from 4-11% [4,5]. Adolescents with Diabetes Mellitus Type I present a uniquely high risk for suicide due to access to a potentially lethal means for suicide attempts: insulin. Misuse of insulin is a common and concerning method for self-harm and suicide-related behaviors in adolescents with diabetes [4,5]. In a sample of youth with insulin dependent diabetes mellitus, those who attempted suicide commonly used diabetes-related methods [6,7]. The following case report examines the suicide attempt via insulin injection of an adolescent female with Diabetes Mellitus Type I. The case is discussed and recommendations are made for the identification and management of suicidal adolescents with Diabetes Mellitus Type I.

### Presentation of Case

The patient is a 17 year old female with a known history of recurrent major depressive disorder with previous suicide attempt by insulin pump overdose, non-suicidal self-injury, generalized anxiety disorder, and a 5 year history of poorly controlled Diabetes Mellitus Type I, who presented to a pediatric emergency department following an intentional overdose of 120 units of fast-acting insulin resulting in a several day medical hospitalization for stabilization followed by an acute inpatient psychiatric hospital admission. Since the patient's diagnosis of Diabetes Mellitus Type I at age 12, she had struggled with persistently poor glucose control. In the year prior to this event, the

patient's mean HbA1c was 9.2 (target goal <7.5). The patient's history included one previous suicide attempt to bolus a large quantity of insulin through her insulin pump. After that attempt, patient was transitioned to injectable insulin for ongoing management.

In addition to her medical and mental health history, this patient also endorsed several social and familial suicide risk factors that helped to contextualize her recent suicide attempt. She reported a history of being bullied at school and manipulated to participate in online sexual activities with strangers. She also reported current interpersonal struggles with her peers. She specifically indicated that this recent suicide attempt was precipitated by feelings of being overwhelmed by schoolwork and peer relationship issues. She stated that she made the suicide attempt because she was seeking an "immediate sense of relief" from these interpersonal stressors. With respect to family history, her biological parents divorced when she was 3 years old and she noted that her father had not been a stable part of her life for many years. The patient described having a close relationship with her mother but that she struggled with create desire for more independence. The patient's mother, father, and maternal grandparents were reported to have histories of mood disorders.

This case report illustrates the potential additive risk of vulnerable diabetic adolescents who have easy access to a lethal means of suicide. This patient described her insulin overdose as an impulsive act with intent to kill herself; furthermore, she expressed that having a readily available medication that was deadly in overdose enabled her sudden decision to attempt suicide. She stated "it was the easiest access and doesn't leave anything behind." The patient also noted that she chose this method specifically as she knew that she would die. She reported that ten minutes had elapsed between the thought of killing herself and the act. She had noted that if she had not had insulin in that moment she did not believe she would have tried another method and ultimately would not have attempted suicide. She further stated that if she had access to razors in that moment she would have cut herself rather than made a suicide attempt, demonstrating the significance of having readily available lethal vs. non-lethal methods. Finally, the patient demonstrated how her knowledge as a diabetic factored into her behavior. She reported her previous suicide attempt via an insulin

pump overdose “did not work.” She reported this knowledge and experience factored into her most recent attempt method, stating “I took a lot more...I took 120 units. That’s a lotta insulin to be taking and especially in one direct shot. Cuz I did two shots of 60 because my pen will only go up to 60 units. That’s all that was left in my pen. I know that if there was more I would take more.”

The patient spent several weeks in treatment in the inpatient psychiatric unit. During her hospitalization, a key feature of treatment was to develop a safety plan which could account for her ongoing need for insulin. Prior to this hospitalization, changes to her diabetes management plan had already been implemented to reduce risk of future overdose. She had been transitioned from using the insulin pump to using injectable insulin (pens), with the goal of preventing the patient from self-bolusing a large dose of insulin from the pump. Additionally, insulin pens were stored by the school nurse and by her parents at home. In spite of these changes to her regimen, she had been able to change the dose on the pen after it was verified by the school nurse. Given this history, the clinical team decided that the supervision plan for this patient would need to become even more stringent. The safety plan was therefore modified to require parental/school nurse to control all access to insulin and to directly observe and verify all doses and administrations.

The modified safety plan brought up new concerns to the treatment team during her hospitalization, because the patient struggled greatly with surrendering her independence in insulin administration, and also because it became clear that her need for direct supervision would be impossible to implement on days when she was at work or socializing with friends. With the goal of balancing her developmental need for burgeoning independence and the competing need for supervision of her insulin administration, the clinical team recognized that there would be times when patient was away from adult supervision and would not be able to administer insulin as needed. The clinical team was able to address these concerns by introducing Metformin to the patient’s diabetes management plan. The patient was able to tolerate this medication well, and we were able to demonstrate that it was immediately effective in reducing her overall daily insulin requirements. Taking a harm reduction approach, our primary medical goals were to prevent instances of diabetic ketoacidosis, hypoglycemia, and suicide via insulin overdose. With a decreased total daily demand for insulin, and improved insulin sensitivity, this patient was much less likely to develop DKA, even in the event that she needed to miss a dose of short acting insulin, due to lack of supervision. The risk for metformin overdose was considered in this case, and safety planning around patient access to the medication (parental control of all medications) was integrated into the safety planning.

With respect to the psychosocial component of her treatment, the patient responded favorably to a combination of brief supportive, cognitive behavioral and interpersonal types of individualized therapy. Her psychotropic medication regimen was cross-titrated from bupropion 24 hour extended release 200 mg daily to fluoxetine 20 mg daily. Weekly outpatient treatment was recommended in addition to psychopharmacology follow up. An in-home behavioral health team was recommended; patient and family were wait-listed for this service due to limited availability.

## Discussion

This case highlights the challenges of managing suicide risk in adolescents with diabetes. Although suicidal ideation is common in

depressed adolescents with diabetes [3], the risk for suicide becomes more prominent in the presence of other psychosocial problems. For instance, in this case report the patient was experiencing acute interpersonal stressors as well as chronic familial instability. The patient’s poor distress tolerance in the context of these chronic and acute stressors may have been what transitioned her from thinking about suicide to acting on these thoughts. Additionally, the patient in this case report had a history of poorly controlled diabetes, which likely contributed to her worsening depressive and suicide-related symptoms, and vice-versa. There is evidence suggesting a strong relationship between suicidal ideation and serious noncompliance with medical treatment as depressed mood frequently contributes to poor adherence to diabetic and self-care regimens, participation in exercise, glucose monitoring, and medication compliance [6]. The role of gender must also be taken into account in this case, as the likelihood of experiencing suicidal ideation to be even more pronounced in female than male diabetic patients, with one study finding females to have a 9x higher risk for recurrent and protracted depression [8,9].

Adolescents with insulin dependent diabetes who endorse suicidal ideation are at greater risk for suicide when they have ongoing access to lethal means of large quantities of injectable insulin. Many adolescents are responsible for their own insulin management; therefore, should they have an episode of suicidal ideation when their insulin is readily available, they are at particularly acute risk of attempting with this method. This case highlights the danger of diabetic adolescents having injectable insulin readily available when they are experiencing even fleeting suicidal thoughts. Additionally, because the patient had attempted suicide before with an insulin pump, she used this knowledge to substitute for the more lethal method of insulin injection in order to achieve “immediate relief” faster. This case exemplifies the complications inherent in treating adolescents with suicidal ideation and depressed mood who require access to lethal means in order to manage their diabetic illness.

With respect to suicide prevention and early intervention strategies, this case report demonstrates the importance of incorporating suicide risk screening into routine assessments in medical settings, as detection of risk can serve as a gateway into mental health treatment. Therefore, it is essential to implement validated instruments that assess suicide risk [10-15]. With respect to practice guidelines for the assessment and treatment of patients with suicidal behaviors, the American Psychiatric Association suggests 1) conducting an in-depth psychiatric examination, 2) asking explicitly about suicidal ideation, intent, plans, and attempts, 3) estimating the patient’s level of suicide risk, and 4) including modifiable risk and protective factors in treatment planning [16]. Throughout this process of assessment and treatment, communication between mental health providers, adolescents, and their parents/guardians is essential in optimizing health and mental health outcomes. Also critical in the screening process is the accessibility of psychiatric services for diabetic youth who screen positive for suicide risk in a medical setting.

Access to means is a distinguishing factor between adolescents hospitalized for suicidal risk and adolescents who die by suicide [17]. Safety planning for storage of lethal methods is a potentially effective form of means restriction when applied as part of routine procedures [18]. Conducting means-restriction counseling with suicidal adolescents and their parents has been shown to increase the likelihood of restricting the availability of multiple lethal means from suicidal individuals [19]. In this case example, an important part of the patient’s safety planning procedures involved the negotiation of a

feasible family-based insulin regimen to ensure the restriction of lethal means.

In addition to comprehensive family-based safety planning strategies with suicidal adolescent with diabetes, suicide prevention and early intervention strategies are needed for this vulnerable population. Early detection of patients at elevated risk for suicidal thoughts and behaviors is essential [10-12]. Broad-based screening [13] as well as targeted screening practices [14] should be implemented in clinical practice settings where adolescents with diabetes receive their medical care. Finally, coordinating psychiatric and medical management of adolescents with diabetes who screen positive for depression, self-harming tendencies, or suicidal ideation is critical in reducing suicide-related morbidity and mortality.

## Conclusion

Adolescents with Diabetes Mellitus Type I are at risk for depression and suicide, particularly suicide via insulin injection, if not identified and managed properly. This case presentation demonstrates the importance of screening for suicidal ideation, monitoring adolescents with diabetes and comorbid suicide-related thoughts and behaviors carefully, and addressing insulin management in safety planning procedures with these adolescents and their families.

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