Diabetic and depressed
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**CASE** Worsening depression

Mr. N, age 64, is a disabled factory worker with a complicated medical history. He has poorly controlled type II diabetes mellitus; obesity (body mass index 40 kg/m²); complicated cryptogenic cirrhosis with prior esophageal varices, portal gastropathy, splenomegaly, and no encephalopathy; surgically treated colon adenocarcinoma; and bilateral thalamic and right occipital infarcts with residual left homonymous hemianopsia and vertical gaze paresis. Mr. N sustained a perioperative stroke 18 months ago while undergoing a colectomy procedure for colon adenocarcinoma; an MRI done at that time showed the bilateral thalamic and right occipital infarcts. While in the internal medicine consultation clinic, Mr. N expresses suicidal and homicidal thoughts, which prompted the internal medicine team to refer him to the emergency department (ED). The team deems Mr. N’s medical problems stable except for diabetic dyscontrol.

In the ED, Mr. N says he feels sad, worthless, and “tired” of his complex family issues and multiple medical conditions. He says he’s had these feeling for at least a year, but his depression has worsened in the last few days. Mr. N is tearful while explaining his discouragement with following a diet for diabetes; earlier that day he ate an entire chocolate cake. He says all 3 of his children have ongoing substance abuse and relationship problems, but he is particularly focused on his youngest daughter, who is involved with a man who is addicted to drugs and physically abuses her and her children. Mr. N describes a detailed plan to shoot him and then commit suicide. This disclosure prompts the ED physician to admit Mr. N to ensure his safety and stabilize his mood.

Mr. N’s temperature is 36.4°C (97.5°F), blood pressure is 123/60 mm Hg, pulse is 81 beats per minute, respiratory rate is 24 breaths per minute, and oxygen saturation is 96% on ambient air. His physical exam is notable only for dysphoria and mild gynecomastia. He shows no evidence of acute cardiopulmonary, gastrointestinal, or other neurologic changes. His serum glucose is 650 mg/dL, and his recent hemoglobin A₁c (HbA₁c) is 10.9%. His other laboratory tests include a hemoglobin of 11.7 g/dL; white cell count, 3500/mm³; platelet count, 41,000/mm³; sodium, 129 mEq/L; potassium, 5.0 mEq/L; alkaline phosphatase, 90 U/L; aspartate aminotransferase, 23 U/L; alanine aminotransferase, 21 U/L; total bilirubin, 1.8 mg/dL; creatinine, 1.2 mg/dL; prothrombin time, 10.4 sec; and arterial ammonia, <50 µg/dL. Arterial blood gases are normal.

A year ago, his primary care physician prescribed fluoxetine, 20 mg/d, for fatigue and chronic back pain and neuropathic pain re-
lated to diabetes. We continue Mr. N’s outpatient prescription of fluoxetine, 20 mg/d, and low-dose acetaminophen as needed for pain. Furosemide, 40 mg/d, spironolactone, 100 mg/d, and propranolol sustained release, 60 mg/d, are maintained for complications of cirrhosis. Insulin aspart, 22 units with breakfast, 24 units with lunch, and 24 units with supper, also are administered routinely.

We consult with the internal medicine, ophthalmology, neurology, endocrinology, and diabetes services to assist in evaluating and managing Mr. N’s multiple medical conditions.

Which condition would you consider as part of the differential diagnosis?

- a) depression due to a general medical condition
- b) adjustment disorder with disturbance of conduct
- c) major depressive disorder, single episode
- d) post-stroke depression
- e) severe decompensation of an underlying personality disorder

**Clinical Point**

Premorbid neuroticism and a history of mental illness are predictors of post-stroke depression

**Diabetes and depression**

Up to 30% of patients with type 2 diabetes mellitus report a lifetime history of major depression. Depression increases the risk of hyperglycemia and accompanying long-term metabolic complications. Few studies have explored the effects of poor glycemic control on depressive symptoms among diabetic patients. A literature review revealed no large-scale study investigating worsened depressive symptoms in patients with poor glycemic control.

The cross-sectional difference between a single episode of major depression and adjustment disorder can be subtle. DSM-IV-TR describes the latter as a maladaptive reaction to an identifiable psychosocial stressor, or stressors, that occurs within 3 months of onset of that stressor (Table 2).

Because we did not deem Mr. N’s depressive symptoms, which were evident only when he was hyperglycemic, to be grossly
disproportionate to his stressors, we diagnose him with major depression rather than adjustment disorder.

**EVALUATION** No psychiatric history

On admission, Mr. N is overwhelmed, tearful, and dysphoric when describing his situation. He displays no evidence of psychosis, but his judgment and insight are impaired. He shows no change in consciousness or ability to stay awake. Mr. N acknowledges hypersomnia, anhedonia, anergia, and decreased concentration and continues to express suicidal and homicidal thoughts. He repeatedly denies any personal or family psychiatric history or personal substance abuse, including alcohol and nicotine.

What is the best next step in Mr. N's treatment?

a) increase fluoxetine to 40 mg/d
b) aggressively treat Mr. N’s underlying medical conditions before changing medications
c) use behavioral activation only; ask Mr. N to focus on group therapy and educate him about healthy lifestyle
d) discontinue fluoxetine and switch to a serotonin-norepinephrine reuptake inhibitor

**TREATMENT** Glycemic control

Mr. N receives 1 L of saline in the ED and is encouraged to drink more water during hospitalization. With appropriate insulin dosing, Mr. N’s serum glucose levels improve from 650 to 426 mg/dL by the next morning. On his third hospital day, Mr. N’s glucose level is 155 mg/dL in the morning. With tighter glycemic control, his dysphoria improves. He is future-oriented, markedly less dysphoric, and denies homicidal or suicidal ideation. Mr. N is interested in participating in group therapy, and his insight and judgment regarding his homicidal and suicidal thoughts improve. He still doesn’t fully understand the importance of diabetic control, and he struggles with his diet.

On the fourth hospital day, Mr. N’s glucose level rises to 325 mg/dL in the early evening. Subsequently, his mood deteriorates; he becomes increasingly withdrawn and somnolent. With appropriate attention to his dietary intake and supplemental insulin, his serum glucose improves to the 100 to 200 mg/dL range overnight, and his mood improves. When the glucose is controlled, he attends group therapy, tends to his hygiene, denies feeling hopeless, and offers several ideas about how to manage his family situation. After his glucose rises, Mr. N becomes isolative, hopeless, and unable to cope with stressors. With considerable education about the importance of glycemic control, Mr. N is hopeful and future-oriented when he is discharged after 9 days of hospitalization. At outpatient

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**Table 2**

**DSM-IV-TR diagnostic criteria for adjustment disorder**

A. The development of emotional or behavioral symptoms in response to an identifiable stressor(s) that occurs within 3 months of the onset of the stressor(s)

B. These symptoms or behaviors are clinically significant, as evidenced by either of the following:
   - Marked distress in excess of what is expected from exposure to the stressor
   - Significant impairment in social or occupational (academic) functioning

C. The stress-related disturbance does not meet criteria for another specific axis I disorder and is not merely an exacerbation of a pre-existing axis I or axis II disorder

D. The symptoms do not represent bereavement

E. Once the stressor (or its consequences) has terminated, the symptoms do not persist for more than an additional 6 months

Specify whether the condition is acute or chronic, as follows:

- **Acute:** The disturbance lasts <6 months
- **Chronic:** The disturbance lasts ≥6 months

*Source:* Reference 12

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**Clinical Point**

Depression increases the risk of hyperglycemia and accompanying long-term metabolic complications.
evaluation, he continues to report euthymia with adequate glycemic control.

**The authors’ observations**

Patients with hyperglycemia may experience symptoms secondary to volume depletion and hyperosmolality. The severity of these symptoms generally is proportional to the extent and duration of the hyperosmolar state. Initially, most patients complain of polyuria and polydipsia, but in more severe cases, mental status changes may evolve and include lethargy, twitching, cloudiness, motor or sensory defects, seizures, and coma. Some evidence shows that hyperglycemic patients with hyperosmolality are symptomatic only if hypernatremia is present. Mr. N was hyponatremic, which resolved with aggressive hydration and insulin administration.

Traditionally, depression has been observed to worsen glycemic control in diabetic patients; discussion of increased glucose levels leading to worsened depression rarely has been reported. In a meta-analysis, Lustman et al revealed that depression is significantly associated with hyperglycemia. A review by Li et al demonstrated that depression is much more common in patients with diabetes compared with general population and 45% of diabetes patients with depression were undiagnosed. Calhoun et al showed that for every 1-unit increase in HbA1c, the odds of depressive symptoms increase by 22%. Researchers also found a positive relationship between depression and glycemic control in American Indians.

Mr. N’s case is further evidence that the relationship between diabetes and depression is bidirectional and diagnosis and treatment of each illness impacts the

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**Clinical Point**

In severe cases of hyperglycemia, mental status changes may include lethargy, twitching, cloudiness, motor or sensory defects, and coma.

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**Related Resources**


**Drug Brand Names**

- Fluoxetine - Prozac
- Furosemide - Lasix
- Insulin aspart - NovoLog
- Insulin glargine - Lantus

**Methyldopa - Aldomet
Propranolol - Inderal
Reserpine - Serpasil
Spironolactone - Aldactone**

**Disclosure**

The authors report no financial relationship with any company whose products are mentioned in this article or with manufacturers of competing products.

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Have a case from which other psychiatrists can learn?

**Check your patient files for a case that teaches valuable lessons on dealing with clinical challenges, including:**

- Sorting through differential diagnoses
- Getting patients to communicate clinical needs
- Catching often-missed diagnoses
- Avoiding interactions with other treatments
- Ensuring patient adherence
- Collaborating with other clinicians

**Send a brief (limit 100 words) synopsis of your case to erica.vonderheid@qhc.com. Our editorial board will respond promptly. If your synopsis is accepted, we’ll ask you to write about the case for a future issue of CURRENT PSYCHIATRY.**
other. Although this case does not confirm causality, it highlights the importance of aggressive approaches to screening and treatment of depression in patients with diabetes, and vice versa.

References

Clinical Point
One study showed that for every 1-unit increase of HbA₁c, the odds of depressive symptoms increase by 22%.

Bottom Line
Depression is more common among patients with diabetes than the general population. Higher blood glucose levels may be associated with depressive symptoms in some patients. When addressing depressive symptomatology in patients with medical comorbidities, treat the underlying medical condition first and consider biopsychosocial factors such as family relationships, social support, coping skills, and distress tolerance.