

Neuropsychiatric screening in type 2 diabetes mellitus

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ABSTRACT

Diabetes mellitus is considered to be one of the most psychologically demanding of the chronic medical illnesses and is often associated with several psychiatric disorders. Psychiatric disorders can be a risk factor for, as well as a complication of, diabetes leading to bidirectional association between the two morbidities. Physicians caring for people with diabetes must be trained to recognize and manage comorbid psychiatric conditions that commonly occur. Our current article reviews the various screening procedures for effective evaluation of the neuropsychiatric illnesses coexisting with diabetes and other pertinent issues.

Key words: Diabetes mellitus, psychiatric disorders, screening

INTRODUCTION

In a chronic disorder like diabetes mellitus, treatment adherence is major challenge. Poor compliance could be due to various reasons among which neuropsychiatric problems are an important issue. Coexistent psychiatric illness in diabetes leads to impaired quality of life,^[1] increased cost of care,^[2] phobia of needles and injections interfering with investigations and treatment process,^[3] poor treatment adherence,^[4] poor glycemic control with increased admissions due to hyperglycemic emergencies and other complications,^[5-7] altered pharmacokinetics of antidiabetic agents due to substance abuse involving tobacco and alcohol,^[3] higher absenteeism,^[7] and overlapping clinical presentation.^[3] Assessing a diabetic in toto includes psychosocial status.^[8] Neuropsychiatric screening should include patient's attitudes about the illness and expectations

from the treating physician and hospital. Quality of life affects mood and the available financial, emotional, and social support. Neuropsychiatric issues in diabetes have a significant influence on patient outcomes and quality of life.

It is common for patients to experience emotional distress from living with diabetes and the effect of its complications. "Diabetes burnout" and "Diabetes overwhelms" are the terms that have been used to display the distress of diabetes.^[9] We have discussed the various screening modalities to define various psychiatric morbidities noted in diabetic patients.

SCHIZOPHRENIA AND DIABETES

Schizophrenia is an independent risk factor for diabetes. Development of glucose intolerance, diabetes, and ketoacidosis is reported with atypical antipsychotics. Patients with schizophrenia are 2- to 4-fold more likely than the general population to be overweight or obese.^[10] Antipsychotics contribute to weight gain. Structured weight control and exercise programs can yield good results. The "Brief Assessment of Cognition in Schizophrenia" (BACS) score includes six parameters for evaluation in 35 minutes.^[11] "Repeatable Battery for the Assessment of Neuropsychological Status" (RBANS)^[12] and the

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“Schizophrenia Cognition Rating Scale” (SCoRS)^[13] are also useful tools taking less than 30 minutes for administration. Others like “Brief Cognitive Assessment Tool for Schizophrenia” (B-CATS) can be administered in <15 minutes.^[14]

ANXIETY IN DIABETES

Anxiety symptoms are considered to be significant risk factors for diabetes. Diabetes too is associated with higher prevalence of anxiety disorders (3 times), with anxiety accounting for poor glycemic control.^[15] Phobia to needles and hypoglycemic episodes further worsen glycemic control. Clinical features such as anxiety, sweating, tremor, tachycardia, and confusion are present in both anxiety and hypoglycemic episodes.^[3] Certain medications such as benzodiazepines, beta-blockers, and selective serotonin reuptake inhibitors interfere with glycemic control.

DEPRESSION IN DIABETES

Patients with diabetes and depressive symptoms have mortality rates nearly twice as high as persons with diabetes and no depression. Depression may be due to biochemical changes of diabetes, like hyperglycemia, inflammation, activation of hypothalamic–pituitary–adrenal axis, or it could be due to the lifestyle factors associated with diabetes.^[16] Also, neurohormonal changes induced by depression, like hypercortisolism, can lead to insulin resistance and diabetes. Behavioral factors associated with depression, including lack of physical activity and poor diet, increase the risk of diabetes. All diabetics should be screened annually for depression. Two simple questions mentioned below help in screening the patients and it is clinically effective.

During the past month, have you often been bothered by feeling down, depressed, or hopeless?

During the past month, have you often been bothered by little interest or pleasure in doing things?

“Geriatric Depression Scale” (GDS): The 15-item GDS is used to screen for depressive symptoms in older individuals.^[17] This measure is scored based on a 15-point scale, and impairment is indicated by a score of 5 or higher. “Hamilton Rating Scale for Depression” (HRSD) is also a useful tool including 21 symptoms.^[18] “Hospital Anxiety and Depression Scale” (HADS) could be used further to quantify severity of anxiety and depression in this population. It has 144 items with two subscales: anxiety and depression, with each item having 4 rating scale. Scores of ≥ 11 are associated with significant morbidity.^[19]

Others like “Patient Health Questionnaire-9” (PHQ-9)^[20] and “Symptom Checklist-90” (SCL-90)^[21] are sensitive and time-efficient tools for both anxiety and depression.

Common side effects of antidepressants which are relevant to diabetes are sedation, weight gain, and related with an impact on cardiovascular system. Alleviating depressive symptoms in these patients has a positive impact on improving their mental and physical functioning, treatment adherence with disease self-management and medication regimens, diabetes outcomes like a better HbA1c.

PERSONALITY DISORDERS IN DIABETES

Diabetic patients have a higher prevalence of borderline personality disorders. This exposes the patients to various other psychiatric comorbidities. The splitting and sabotaging behavior renders the patient care profoundly cumbersome.^[22] Others like opportunistic, alienated, oppositional, and explosive personalities are associated with higher prevalence of diabetes.^[23]

DIABETIC PERIPHERAL NEUROPATHY

All patients with diabetic peripheral neuropathy (DPN) should be screened for psychiatric comorbidities. They may be at an increased risk of committing suicide due to the co-occurrence of unrecognized psychiatric illness and inadequately managed pain.^[24]

DIABETES-RELATED EMOTIONAL DISTRESS

One-third of the diabetics have serious concerns like “worry about the future and the possibility of diabetic complications.” The “Problem Areas in Diabetes” (PAID) is a good tool to assess diabetes-related emotional distress. The PAID is a measure of diabetes-specific emotional distress, which was developed by the Joslin Diabetes Center, Boston.^[25] This self-administered questionnaire consists of 20 items that cover a range of emotional problems frequently reported in type 1 and type 2 diabetes. Each item is scored from 0 to 4 (“not a problem” to “serious problem”). The sum of the 20 items is multiplied by 1.25 to yield a final score of 0–100. Psychometric reports to date on the PAID have shown it to: (i) have consistently high internal reliability (i.e. $\alpha = 0.90$); (ii) have sound ($r = 0.83$) 2-month test–retest reliability using a sample of stable patients; (iii) correlate strongly with a wide range of theoretically related constructs such as general emotional distress, depression, diabetes self-care behaviors, diabetes coping, and health beliefs; and (iv) be a statistically significant predictor of glycemic control in a study that tracked a managed care population control for 1 year.^[26]

COGNITIVE DYSFUNCTION IN DIABETES

Elderly patients with diabetes have an increased risk of developing cognitive problems. One-third of the elderly diabetics have cognitive dysfunction and its presence is associated with poor diabetes control.^[27] Cognitive functions that enable complex behaviors are particularly important for patients with diabetes. But older patients with diabetes and concomitant cognitive dysfunction may find it cumbersome to adhere to the complicated treatment regimens like multiple daily insulin injections, multiple oral medications, and various diet-related instructions. Elderly population is at an increased risk of hypoglycemia due to various reasons including omission of meals, incorrect dose or timing of insulin injections and/or oral medications, and associated renal dysfunction. Diabetes has been associated with increased incidence of functional disabilities and increased risk of falls and fractures. Executive dysfunction is correlated with inability to perform lower-extremity tasks, leading to higher risk of falls. The useful cognitive questionnaires and tests are described below.

The “Mini Mental State Examination” (MMSE) is one of the most commonly used cognitive screening measures because it is quick and easy to administer.^[28] The MMSE includes specific questions related to attention, orientation, memory, calculation, and language. The measure scoring is based on 30 total points and impairment is indicated by a score of 24 or lower. This is a good tool to screen for memory function.

The “Clock-Drawing Test” (CDT) is a simple validated measure of cognitive function.^[29] In this test, participants are presented with two sheets of paper: one provides written instructions and the other serves as a response sheet. The instructions direct participants to draw a clock and set the time to 10 minutes after 11. CDT scored by Mendez method uses a 20-point scale. This system of scoring has been shown to be most accurate in predicting deficit in cognitive function and correlates with MMSE.

The “Clock-in-a-Box” (CIB) test is a modified CDT aimed at screening cognitive dysfunction in the medical setting.^[30] This test was developed specifically to be a fast and reliable index of executive function. In this test, as an added step, participants are asked to draw a clock in the blue box. The total score is the sum of the memory and executive function sub-scores. Total score in CIB is used to assess overall cognitive function.

Patients with diabetes need to be evaluated for barriers to safe and effective diabetes control. Screening for subtle

cognitive dysfunction is important when complicated treatment regimens are used. Glycemic targets should be individualized; patients with diabetes and executive dysfunction may need special education and skills to manage their disease.

SEXUAL DYSFUNCTION AND DIABETES

Both psychological and physiological factors can contribute to sexual dysfunction in diabetics. Sexual dysfunction can be a symptom of co-occurring psychiatric illness, a consequence of medical illness, or a side effect of concomitant medication. Several scales have been developed like the “Changes in Sexual Functioning Questionnaire” (CSFQ), which can be incorporated into a routine initial clinic visit.^[31] Screening for depressive and other psychiatric symptoms like psychosis, anxiety, and substance use disorders, which may be interfering with desire and arousal, is essential.

SUBSTANCE ABUSE DISORDERS

Mostly they include tobacco and alcohol abuse. Tobacco and cigarette use is associated with increased risk of diabetes and its micro- and macrovascular complications by virtue of its actions like hyperglycemia, hyperinsulinemia, endothelial dysfunction, and hypertension.^[32,33] Prevalence of alcohol abuse in diabetics is pegged at 50–60%.^[34] Alcohol consumption in high amounts is associated with increased risk of diabetes. Alcohol is implicated in fasting hyperglycemia, potentiation of drug-induced hypoglycemia or reactive hypoglycemia, hypoglycemia unawareness, synergistic effect on neuropathy and retinopathy, interaction with antidiabetic agents (lactic acidosis with metformin, disulfiram like reaction with chlorpropamide, hepatopathy leading to reduction in dose).^[3] “Fagerstrom Test for Nicotine Dependence” (FTND)^[35] and CAGE^[36] questionnaire (Acronym of 4 questions like 1. Have you ever felt you needed to Cut down on your drinking?, 2. Have people Annoyed you by criticizing your drinking?, 3. Have you ever felt Guilty about drinking? 4. Have you ever felt you needed a drink first thing in the morning [Eye-opener] to steady your nerves or to get rid of a hangover?) are used for evaluation.

CONCLUSION

Multipronged interaction between psychiatric illnesses and diabetes makes the management of diabetes more challenging. Increased awareness about these comorbidities and timely psychiatrist consultation would help in better care in this group of patients. The various screening tools at disposal would help in early diagnosis of such illnesses.

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