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The Association of Depressive Symptoms with Prediabetes Versus Diagnosed Diabetes: Is Ignorance Really Bliss?

Sherita Hill Golden, MD, MHS[1,2], **Briana Mezuk, PhD**[3]

[1]Department of Medicine, Johns Hopkins University, Baltimore, MD

[2]Department of Epidemiology, Johns Hopkins University, Baltimore, MD;

[3]Department of Epidemiology, University of Michigan School of Public Health, Ann Arbor, MI

Practice Pearl:

Although unrecognized prediabetes (impaired fasti ng glucose and/or impaired glucose tolerance) is not associated with concurrent depressive symptoms, screening for development of depression in individuals with treated/recognized type 2 diabetes remains important.

Keywords

depression; impaired glucose tolerance; impaired fasting glucose; diabetes; screening

History of Condition

Depression is a comorbidity of diabetes and is associated with poor glycemic control and diabetic complications. Whether unrecognized prediabetes in the form of impaired glucose tolerance and/or impaired fasting glucose is also associated with depression is unclear.

Objectives

The study aimed to determine the prevalence of concurrent depressive symptoms along the continuum of glucose tolerance categories in individuals with no previous diagnosis of diabetes or prediabetes.

Study

The study was cross-sectional.

Correspondence: Sherita Hill Golden, MD, MHS, Johns Hopkins University, School of Medicine, Division of Endocrinology and Metabolism, 2024 E. Monument Street, Suite 2-600, Baltimore, MD 21287. Tel: 410-502-0993, Fax: 410-955-0476, sahill@jhmi.edu.

Conflict of Interest Statement

Sherita Hill Golden, MD, MHS discloses a conflict of interest with Merck and Co., Inc. Briana Mezuk, PhD discloses no conflicts of interest.

Study Participants

The study included 1047 individuals with no prior history of known diabetes, recruited by the Screening for Impaired Glucose Tolerance (SIGT) Study at Emory University in Atlanta, GA, between January 2004 and February 2007. Participants were not using steroids, were not pregnant, and were in relatively good health. The mean age was 48 years, the mean body mass index was 30 kg/m^2 (ie, considered obese), 63% were female, and 54% were black.

Data Application in Practice

Study participants were screened for prediabetes and diabetes using the 75-g oral glucose tolerance test, and glucose tolerance status was defined according to the American Diabetes Association criteria. Prediabetes was defined as impaired fasting glucose and/or impaired glucose tolerance. Depressive symptoms were assessed using the Patient Health Questionnaire-9 (PHQ-9). The PHQ-9 is a 9-item, self-administered, validated screening tool for current depression. Symptoms were classified as minimal, mild, moderate, moderately severe, and severe. Data were collected on additional covariates, including physical activity, family history of diabetes in first-degree relatives, smoking status, dietary intake, history of depression, and education level.

Outcome Measures

In analysis 1, the median PHQ-9 scores and depression severity were compared across glucose tolerance categories. In analysis 2, the odds of glucose intolerance were compared across categories of depressive symptom severity.

Findings

In total, 1047 individuals were included in this analysis: 61% had normal glucose tolerance, 17% had isolated impaired fasting glucose, 9% had isolated glucose intolerance, 9% had both impaired fasting glucose and glucose intolerance, and 5% had diabetes. In analysis 1, PHQ-9 scores and depression severity were not different across glucose tolerance categories. Similarly, in analysis 2, depression severity was not associated with a greater likelihood of having glucose intolerance.

Conclusion from Data

There was no association between depressive symptoms and unrecognized glucose intolerance, making it unlikely that unrecognized glucose intolerance contributes to development of depression.

Commentary

Sherita Hill Golden, MD, MHS and Briana Mezuk, PhD

As Rhee et al point out, the prevalence of clinical depression and depressive symptoms are higher among persons with type 2 diabetes mellitus compared with the general population.[1] When this cross-sectional association was observed initially, it was unclear

whether depression leads to development of type 2 diabetes or whether having diabetes leads to an increased risk of depression. Recent research on diabetes and depression has helped to clarify the longitudinal/prospective association between type 2 diabetes and depression, which has been shown to be bidirectional.[2,3] A recent meta-analysis of 13 studies showed that the pooled risk of incident type 2 diabetes was 60% higher in individuals with major depression and/or elevated depressive symptoms compared with those without depression or depressive symptoms.[3] In the same meta-analysis, the pooled risk from 7 studies of incident depression was 15% higher in individuals with type 2 diabetes compared with those without type 2 diabetes.[3]

The report by Rhee et al is one of only a handful of studies to examine the association between depressive symptoms and glucose tolerance status. They used a well-validated depression screening tool appropriate for the primary care setting and were able to establish glucose tolerance status accurately using an oral glucose tolerance test. Their finding that depressive symptoms are not associated with prediabetes and glucose intolerance corroborates findings from the Multi-Ethnic Study of Atherosclerosis (MESA). A cross-sectional analysis of baseline data on 6754 individuals from MESA also showed no association between depressive symptoms and impaired fasting glucose.[4] In prospective analyses of the MESA cohort, neither impaired fasting glucose nor untreated diabetes predicted development of elevated depressive symptoms over 3 years of follow-up.[2] Indeed, impaired fasting glucose was associated with an approximately 20% lower risk of developing depressive symptoms.[2] However, this study confirmed findings from 2 prior studies[5,6] showing that having treated diabetes, compared with normal fasting glucose, was associated with a 54% increased risk of developing elevated depressive symptoms.[2]

These findings may suggest that “ignorance is bliss” and unrecognized prediabetes and diabetes have no adverse psychological consequences. Nevertheless, research is gradually revealing that an established diagnosis of diabetes is associated with an increased risk of depression, although this influence may be stronger for recurrent episodes as opposed to first-onset, and that depression influences the course and prognosis of diabetes outcomes. The fact that treated but not untreated diabetes is associated with a risk of depression suggests that the psychological stress associated with managing diabetes and its comorbidities may lead to depression. As shown in other studies, Rhee et al found that individuals with a greater number of depressive symptoms had poorer health behaviors, including higher dietary intake of saturated fat and a greater likelihood of being smokers, which can worsen metabolic control in established diabetes. These poor health behaviors combined with poor adherence to disease management, as seen in patients with comorbid depression and diabetes[7] can lead to adverse clinical outcomes in those with both conditions.[8] Although depression may not be associated with prediabetes, screening for development of depression in individuals who subsequently progress to type 2 diabetes will continue to be important. Future studies are needed to determine the most effective behavioral and pharmacological interventions for individuals with comorbid depression and diabetes to improve not only depressive symptoms but also clinical outcomes.[9,10] Finally, given the very low prevalence of even moderate depressive symptoms in the SIGT 3 population (sample prevalence of moderate-to-severe symptoms [7%]) in this report, future studies are needed to examine further the prospective associations between depression and

diabetes risk and to explore potential physiologic and behavioral mechanisms underlying this association.

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