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Depression among Korean Adults with Type 2 Diabetes Mellitus: Ansan-Community-Based Epidemiological Study

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Abstract

Objectives: There are an increasing number of studies being carried out on depression in patients with diabetes. Individuals with diabetes have been reported as having a higher prevalence of depression compared to those without diabetes. However, only a few studies involving Korean patients have been conducted. The aims of this study were to examine the prevalence of depression and to find various risk factors according to the degree of depression among Korean patients with Type 2 diabetes mellitus (T2DM).

Methods: An Ansan-community-based epidemiological study was conducted from 2005 to 2012. The total number of participants in this study was 3,540, from which patients with diabetes ($n = 753$) have been selected. The presence of depression was evaluated using the Beck Depression Inventory total score.

Results: The prevalence of depression was 28.8%. The mean age of participants was 55.5 ± 8.2 years. We divided the participants into three groups (without-depression, moderate-depression, and severe-depression groups) to examine the depression prevalence among Korean T2DM patients. The unemployed participants had 2.40 [95% confidence interval (CI) 1.21—4.76], the low-income participants had 2.57 (95% CI 1.52—4.35), the participants using an oral diabetes medicine or insulin had 2.03 (95% CI 1.25—3.32), the participants who are currently smoking had 2.03 (95% CI 1.10—3.73), and those without regular exercise had 1.91 (95% CI 1.17—3.14) times higher odds of depression in the severe-depression group, compared with the without-depression group.

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Conclusion: There was a significant association between depression prevalence and diabetes, and we found various risk factors according to the degree of depression in Korean patients with T2DM.

1. Introduction

The World Health Organization has reported that about 350 million people have depression, and about one million people with depression worldwide commit suicide every year. Also, according to the latest cause-of-death statistics (2013) released by the National Statistical Office of Korea, 14,427 out of every 10 million deaths in Korea are attributable to suicide. Suicide is the fourth leading cause of death in Korea [1].

In the Sixth Korea National Health and Nutrition Examination Survey (2013), among people more than 19 years of age, 10.7% (men 6.6%, women 13.7%) experienced depression continuously for more than 2 weeks in a year (Korea age, standardization) [2]. It can be seen that women feel more depressed than men. A history of depression, a family history of depression, a major disease occurrence before the age of 40 years, post-menopausal status [3], body mass index, serum-protein concentration, hemoglobin concentration, smoking, exercise [4], and marital status in the elderly [5] have all been reported as risk factors for depression. Glycated hemoglobin (HbA1c), erectile dysfunction, blood pressure, and waist-to-hip ratio [6] have been reported to be relevant.

In recent years, studies on depression of patients with diabetes have been actively proceeding [7]. Individuals with diabetes have been reported as having a higher prevalence of depression compared to those without the condition. The prevalence of depression in people with diabetes is higher in women [8,9], unmarried people [5], those with more children [10], and those with low vitamin B6 [11,12]. Also, patients with both depression and diabetes have low adherence to diet and exercise instructions, which may contribute to the worsening of their quality of life and the deterioration of their diabetes [13]. One-third of individuals with their first diabetic foot ulcer suffer from clinical depression, and this has been reported to be associated with increased mortality [14]. Diabetes mellitus is also related to childhood obesity [15] and change of lifestyle in the middle-aged and the elderly in Korea [16,17] with metabolic change [18].

It has been reported that other factors affecting depression in a diabetic patient include age, body mass index, drug increases, neurological disease, retinopathy, sexual dysfunction [19], microvascular and macro-vascular complications [20], incident end-stage renal disease [21], and systemic inflammation [10].

There are many previous studies on depression among participants with diabetes. However, studies for the Korean population [8,22] are rare. The aims of this study were to examine the prevalence of depression and to find various risk factors according to the degree of depression in patients with Type 2 diabetes mellitus (T2DM), especially Koreans.

2. Materials and methods

2.1. Study participants

An Ansan-community-based epidemiological study has been conducted by the Korea National Institute of Health. The participants were selected to reflect the gender and age of the Korean population after randomly extracting 40- to 69-year-old residents in Ansan City. The total number of participants from 2005 to 2012 was 3,540. Patients without diabetes and patients who did not respond to the depression survey items were excluded from the study. Therefore, the total number of study participants was reduced to 753.

2.2. Depression assessment tool

The presence of depression was evaluated using the Beck Depression Inventory (BDI) total score. The BDI, which measures the emotional, cognitive, motivational, and physiological items, is one of the most widely used measures of depression. The instrument consists of 21 items, and the score, which determines the possible degree of depression, ranges from 0 to 63. Higher scores indicate greater depression. There are many opinions regarding the most appropriate cutoff points. In the West, a score of 15 or more is generally considered to indicate depression. However, cutoff points from 16 to 21 may be more appropriate in other populations, including Koreans, because research has shown that the average value of the BDI is higher in these populations than in Westerners [23].

The Depression Clinical Research Center, specified by the Ministry of Health & Welfare, classifies BDI scores as follows: "nondepressed state: 0−9; mild depressive state: 10−15; moderate depressive state: 16−23; and severe depressive state: 24−63."

The BDI was translated by Lee and Song [24], and it has been used in a number of papers [25−28] with cutoff scores of ≥16. Therefore, we used the most commonly used cutoff score for BDI of ≥16 to indicate clinical depression.