

# The Role of Depression on Glycemic Control

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## Abstract

Diabetes mellitus (DM) is a chronic disease with clinical complications and is responsible for many hospital stays. The complications of DM are related to hyperglycemia and other related diseases. Comorbidity of depression decreases glycemic control due to a depressed mood that interferes with self-care, as an irregularity in the low-glycemic index diet, prescribed medication and lack of physical activity.

**Keywords:** Diabetes mellitus; Glycemic control; Self-care; Depression

## Introduction

Diabetes mellitus type 2 (DM2) is an important risk factor for cardiovascular disease (CVD). The CVDs are responsible for 80% of the deaths in these patients. Diabetics are three times higher risk of death from CVD compared to the general population [1].

The DM2 is characterized by insulin resistance and secretion of hormones deficiency. The increase of glucose in the bloodstream causes several serious symptoms, such as weight loss or significant increase, sensations of cold and heat, pain, cardiac, among others, generating the need for self-monitoring of blood glucose several times 1 day [2].

The central component in the treatment of DM is self-care. Disease management requires a comprehensive approach that includes changes in lifestyle: changes of eating habits, physi-

cal activities, watching your feet and the use of medications on a regular basis. For these reasons, many patients with DM2 may develop changes in mood and even depression [3].

The DM and depression often occur in comorbidity [4, 5]. In diabetic patients the depression has been linked with poor glycemic control and low adherence to self-care activities. The lack of self care in diabetics is seen as one of the explanations for depression-related hyperglycemia [6].

The Multi-Ethnic Study on Atherosclerosis (MESA) investigated the incidence of DM2 in 5,201 diabetics during a period of 3.2 years, and noted that individuals with high rate of depression showed risk 1.42 times of occurrence of DM2. The depression risk factor for diabetics was linked to lifestyle, such as eating habits, physical inactivity and smoking [7].

This mental disorder may precede or follow the start of diabetes complications depending on the individual or the course of the disease [8]. Therefore, knowing the impact of depression can be beneficial to guide therapeutic intervention targeted to depressed diabetics, and it is very important. The evidence from controlled studies suggests that the diagnosis and treatment of depression may lead to an improvement in the evolution of these individuals [9].

## Depression and Glycemic Control

The neurochemical and hormonal changes present depression that cause hyperglycemic effects, and glycemic metabolism disorders may result. The increased activity of the hypothalamic pituitary adrenal glands and the sympathetic nervous system, results in increased release of cortisol and release of catecholamine. Also, epinephrine and norepinephrine can lead to increased blood sugar via decreased insulin synthesis or increased peripheral resistance to insulin action [3].

Depression in patient with diabetes has been suggested as one of the possible causes of poor metabolic control. In 2002, Martins et al [10] observed poorer control of blood glucose and glycated hemoglobin (HbA1c) among diabetic women with depression compared to non-depressed, showing the negative effect of depression on adherence to treatment and risk of complications of DM2.

The study of Papelbaum and colleagues showed that patients with DM2 depression showed higher levels of HbA1c when compared with those who did not present mood disorder.

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The authors observed still high rate of depression in individuals who made use of insulin as compared to patients who used oral hypoglycemic [11].

These authors showed that diabetics with depression have attitudes that result in a negative impact on fasting glucose and HbA1c, whether by difficulties with regard to changing habits of life, as well as presenting greater body mass index and smoking.

The symptoms of depression are related to decreased adherence to dietary guidelines, greater risk of interruption in the use of medications, and worst overall operation contributing to the possible difficulty of change of habit and the capillary glycemic, insulin application and control of hyperglycemic diet. A meta-analysis containing 47 independent studies demonstrated that depression in patients with DM was significantly associated with non-adherence to treatment. There was a negative effect for patients with DM with depressive symptoms in the absence of medical consultations attendance [12]. In addition, it has been shown that diabetic adults with little humor changes respond to programs intended for weight control and smoking cessation, among others. Also the functional impairment associated with an increase in symptoms of depression, in turn, would make it even more functional style modifications related to the low quality of life of individuals with DM2 [5, 10]. The adherence to treatment is important to reduce the risk of complications of DM. Thus, the appropriate use of prescription drugs, such as oral medications and insulin, as well as a healthy diet and exercise, is fundamental to the adequate control of blood glucose.

## Conclusion

The impact of depression may influence the clinical course of the DM2. Diabetics with mood present difficulty to daily glycemic monitoring, implementation of physical exercise, diet control and lack of adherence to the medication. Therefore, depression can contribute to poor glycemic control in the treatment of individuals with DM2.

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