



BIDIRECTIONAL ASSOCIATION BETWEEN DEPRESSION AND DIABETES

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ABSTRACT

Diabetes mellitus is a major health problem not only in developing countries but also in developed countries. Depression and diabetes are two major health disorders that are bidirectionally associated. Some studies show strong relationship between diabetes and depression. Sometimes diabetes and depression combinedly increase the mortality and morbidity rate. Early identification and proper treatment of depression can improve the quality of life.

KEYWORDS: Depression, Diabetes, Mortality, Neurotrophic, Catecholamine.



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INTRODUCTION

Depression is a known comorbid condition of diabetes¹. Diabetes and depression are major public health conditions causing significant morbidity and mortality². Diabetes is associated with depression and depressive symptoms, but the strength and causal direction of these associations are unclear³. Meta-analyses have shown that the risk for depression is elevated in type 2 diabetes, compared with non diabetic control subjects⁴. Worldwide, the prevalence of diabetes in all age groups was estimated to be 2.8% in 2000 and 4.4% in 2030⁵. Two recent meta analyses of longitudinal studies suggest that depression is associated with a 40 – 60% increased risk of developing type 2 diabetes⁶. It has been suggested that physical inactivity smoking, obesity and use of psychotropic medication may be parts of the causal pathway linking depression to diabetes^{6, 7}. Persons with a sedentary life style, a poor diet is associated with obesity and type-2 diabetes⁸. Talbot and Nouwen⁹ stated that there is no solid evidence that the initial occurrence of clinically significant depression results either from biochemical changes directly attributable to type 2 diabetes or its treatment or from the psychosocial demands imposed by the illness or its treatment. Depressed patients visit their Primary care physicians more often than patients who are not depressed. Depression is a medical disorder due to imbalance between different hormones and neurotransmitters. Major depression is seen in 20 -25% of patients with Diabetes mellitus, Cancer, HIV/AIDS and Asthma. Approximately 11-15% of patients with diabetes suffer from major depression. There are more than 25 FDA approved anti – depressant medications available for the treatment of depression. The 2004 NYC HANES study showed that 8% of the New York population had a diagnosis of depression at the time of survey but only 37% were receiving clinically appropriate treatment¹⁰. Depression is associated with increased mortality in general population, especially among older adults according to many study reports^{9, 11, 12}. Wulsin et al¹³ identified 57 studies carried out between 1966 and 1996, of which 29 demonstrated positive results, 13 negative results and 15 mixed result according

review of the relation between depressions and mortality. Excess mortality is seen when subjects have depression and other certain illnesses such as coronary artery disease, myocardial infarction, stroke, congestive heart failure or ischemic heart disease^{14, 15, 16}. People with diabetes mellitus have a high risk of depression and depression increases mortality among people with other conditions. Both depression and diabetes have been found to be at increased risk for the development of cardiovascular complications of diabetes and have increased mortality rates¹⁷.

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Diabetic patients are at twice the risk of developing depression than the normal persons. Prevalence of depressed patients with type 2 diabetes is higher than non diabetics. Individuals with diabetes are more prone to develop depression than individuals who are non – diabetic. However the reasons for the high prevalence of depression in type 2 diabetes remains unclear. Most probably depression may result from having a chronic disease with its associated complications¹⁸. Depressed persons isolate themselves, decreasing the social contacts and supports, this could be crucial for glycemic control, treatment compliance and survival for diabetes^{19, 20}. But the exact nature of the relationship between hyperglycaemia and depression remain unclear^{3, 8}. Depression may result from hyperglycaemia by two mechanisms: (1) through symptoms such as fatigue and difficulty in concentration, fear of complications²¹ and (2) through physiological processes, including inflammatory reactions, and reductions in neurotropic functions, which in turn lead to reduced plasticity of nervous system leading to depression^{22, 23, 24}. Neuro-hormonal changes mediated through the hypothalamic – pituitary – adrenal axis may be related to depression and diabetes. Counter regulatory hormones like cortisol and catecholamines have been found to increase in depression²⁵. Activated hypothalamo – pituitary – adrenal axis, sympathetic system and counter regulatory hormones related to

depression increase susceptibility to insulin resistance, obesity and type 2 diabetes²⁶. Diabetic patients with depression have poor self management without maintaining good physical activities, not checking blood glucose level regularly, uncontrolled diet and do not take medicines regularly^{27, 28}. Other risk factors like socioeconomic status, race and ethnicity also develop depression in patients with diabetes mellitus. Depression also plays a negative role in treatment for diabetes. Persons with depression may result diabetes due to increased inflammatory activation, alterations in the glucose transport system and release of different hormones²⁹. Some hormones like catecholamine, growth hormone, glucocorticoids can lead to increase blood sugar level³⁰. In a study it has been seen that improvement in depressive symptoms may lead to improvement in hyperglycaemia³¹. Cytokines like IL – 6 which is released more in diabetic persons may induce depressive psychosis²⁴. Studies that have been examined showed that there is bidirectional association between diabetes and depression, although the causal relationship is unclear. Several studies assessed the presence of severe depressive symptoms significantly elevated mortality risk among adults with diabetes; the same pattern is not observed among people without diabetes. [From NHANES I Epidemiologic Follow-up Study] According to Beck's Hopelessness Scale some studies showed the

role of diabetes in suicidal attempt scored higher³². By the year 2020, type 2 diabetes will overtake infectious diseases as the biggest killer worldwide³³.

CONCLUSION

Depression and diabetes are bidirectionally associated. Both have major impact on health and economic outcomes. Improvement in depression score is correlated with improvement in glycaemic control. Also improvements in glycaemic control are correlated with improvements in depressive symptoms. Over the past two decades, depression is still undiagnosed and untreated in some cases. This has a crucial impact when the patient has a coexisting chronic disorder like diabetes mellitus. It is important for screening and treating adults for depression at an early stage to avoid a worse outcome. All individuals with diabetes and their families should be regularly screened for symptoms of psychological and social distress. Multidisciplinary team should be in the diseases clinic that includes psychiatrists and psychologists for further management of depression. Concerning awareness and identifying these conditions early improves the outcomes of depression and diabetes and ultimately improve health outcomes and quality of life.

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