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Depression and Mortality in Type 2 Diabetes Mellitus

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There has been increasing evidence about the linkage between depression and type 2 diabetes mellitus (T2DM). One of the risk factors for major depressive disorder (MDD) includes chronic or disabling medical conditions such as diabetes [1]. However from previous studies, the relationship and influence between diabetes and depression seems to be bidirectional. Previous study in a prospective design showed that MDD predicted the onset of diabetes after controlling for age, sex, race, socioeconomic status, and body weight [2]. On the contrary, a meta-analysis revealed that patients with T2DM had 24% increased risk of depression compared to non-diabetic controls [3].

The linking mechanism between diabetes and depression seems to be originated from its shared etiology. Patterson et al. [4] reported that a mouse which was exposed to a social defeat paradigm had increased ghrelin and insulin secretion, which increases appetite and fat accumulations, consequently leads to dysregulation of glucose metabolism and weight gain. Additionally, both depression and diabetes seemed to be related with hypothalamic-pituitary-adrenal (HPA) axis, which also controls the cortisol excretion [5]. Along with changes in endocrine system, some researchers revealed that both diseases are associated with the change of neurological system. The hippocampus of the limbic system in brain which has anatomically linked with HPA axis, has main role in controlling memory and emotion. The hippocampus has shown to be deficient in rodent models with depressive symptoms of anhedonia, food avoidance, and immobility [6]. Similarly, T2DM rodents exhibited decreased neurogenesis in the hippocampus [7].

In addition, some researchers suggested that the comorbid diabetes and depression seemed to have additive effect on the rate of mortality. Since patients with MDD had general characteristics that poor self-care, lack of medication compliance, not caring about their diet and exercise [8], the patients with depressed T2DM resulted in increased diabetic complications and higher mortality.

Jeong et al. [9] retrospectively showed that the annual prevalence of depression was higher in T2DM and higher morality was shown in the depressed subjects from the nationwide health insurance service database in Korea. It was the first longitudinal data from Koreans, and the findings are consistent with the previous results that patients with depressed symptoms showed increased mortality in patients with diabetes mellitus. Especially they revealed that the younger age groups and male had higher mortality compared to other subgroups. These findings could be related with more distressing state of younger age patients with diabetic complications. However, accurate statistical analysis considering the presence of diabetic complications or the cause of death was not performed; thus, we could not assume the direct causality only based on the result of this study. Additionally, they could not adjust well-known confounding factors relating to mortality in patients with diabetes due to the limitation of national insurance database itself.

Further study should be needed in prospective, large number cohorts is needed to confirm this results and the clear association to increasing mortality in patients with diabetes and depression. Especially, obesity and metabolic syndrome had

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showed the strong association with MDD [10], further analysis focused on obesity related parameters would be interesting.

In this study, the code-based national registry was used to diagnose depression, not by the self-reported survey or interview by specialist, the diagnosis of depression could be inaccurate. More details about precise diagnosis in psychiatry such as degree of depression, or having suicidal idea as well as the degree of blood glucose control, anti-diabetic drug compliance, and the presence of diabetic complications from the endocrinology side will be needed to clarify the association between the diseases. Future interventional studies with anti-diabetic drugs or anti-depressant drugs on enhancing outcomes in diabetes or in depression will be in a great of interest.

We need more Korean data for understanding the clear correlation between those two important diseases, diabetes, and MDD. Our society is already full-brown of those two diseases with dynamic increase in elderly population. Active collaboration between endocrinologist and psychiatrist to identify more scientific mechanism and meaningful result to help our clinical practice will be important.

CONFLICTS OF INTEREST

No potential conflict of interest relevant to this article was reported.

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