Commentary: Depression and Diabetes Distress

Type 2 diabetes is associated with a two-fold increase in clinical depression compared to the general population [1].   Depression in type 2 diabetes is associated with serious consequences including poor metabolic control [2], higher mortality rates [3] and possibly, increased risk of macro- and micro-vascular complications [4,5].

Meta-analytic studies have found evidence that the relationship between diabetes and depression is reciprocal with depression increasing the risk of incident type 2 diabetes [6] and type 2 diabetes increasing the risk of developing a depressive episode [7]. Although the underlying mechanisms remain poorly understood, both diabetes and depression may be driven by common biological factors including hypothalamic-pituitary-adrenal axis activation [8] and inflammation [9,10].

While contributing to depression, shared biological factors do not fully explain the relationship between diabetes and depression. For example, epidemiological studies have shown that, compared to the general population, the prevalence of depression was increased in people with diagnosed diabetes but not in those with undiagnosed diabetes (i.e.

people who have diabetes but are unaware of having the condition)
[11]. Also, depression is also more prevalent in people with T2DM who
also have diabetes complications, but not in those without complications
[12] suggesting that when the burden of diabetes increases, so do
depression levels. In a recent study from the English Longitudinal Study
of Aging (ELSA) database, Demakakos et al. [13] found higher incident
depressive symptoms in younger older adults with diabetes than their
non-diabetic counterparts (<65 years) but not in those 65 years and
older.

The above studies show that the presence of type 2 diabetes alone is not
sufficient to increase the prevalence or incidence of depression. Rather,
they suggest that depression in diabetes is linked to the burden of living
with and having to care for diabetes especially in the presence of
diabetes complications and the stresses of a working life.

In this context, the concept of 'diabetes distress' has received increased
attention. Defined as 'the concerns and worries about diabetes and its
management', diabetes distress has strong longitudinal associations with
poor glycaemic control, poor self-care and high depressive symptoms,

especially when self-reported [14,15]. This has led to suggestions that depressive symptoms in diabetes may be more reflective of general and diabetes-specific distress than of major psychopathology [16,17]. However, there is considerable confusion regarding the relationship between depressive symptoms and diabetes distress.

In this issue of Diabetic Medicine, two papers tackled this problem by examining the longitudinal relationship between diabetes distress and depressive symptoms. In the first study from Germany, including more than 500 patients (66% Type 1 diabetes) on intensified insulin therapy, Ehrmann et al. assessed depressive symptoms using the CES-D questionnaire [18] and diabetes distress using the Problem Areas In Diabetes (PAID; [19]) questionnaire, at two time points, 6 months apart.

Through a series of regression analyses, Ehrmann et al. showed that having more difficulty living with diabetes (higher diabetes distress) predicts more depressive symptoms 6-month later. Inversely, having more depressive symptoms at baseline predicted more diabetes distress at the 6-moths follow-up. The results did not change after controlling for baseline levels of depressive symptoms or diabetes distress,

respectively. These results showed that there is a bi-directional relationship between depressive symptoms and diabetes distress. Ehrmann et al. also found that people reporting high levels of depressive symptoms and distress at baseline remained depressed at the 6-month follow-up suggesting that diabetes distress is implicated in the persistence of depressive symptoms. However, high levels of diabetes distress at baseline along with depression did not significantly predict persistence of distress at follow-up.

In the second study, Burns et al. followed-up a cohort of almost 1,700 community-dwelling people with type 2 diabetes from Quebec, Canada at three occasions, one year apart. Depressive symptoms (Patient Health Questionnaire, PHQ-9; [20]) and diabetes distress (Diabetes Distress Scale, [21]) were assessed at each time point along with a number of demographic and illness-related covariates. Using a cross-lagged path model analysis and controlling for auto-regressive effects, Burns et al. not only confirmed that the relationship between depressive symptoms and diabetes distress was bi-directional but also that they were reciprocally related. More specifically, diabetes distress was associated with both concurrent and subsequent depression, which, in

turn, was associated with concurrent and subsequent diabetes distress. The results suggest that when people are distressed about their diabetes they are more likely to experience subsequent depressed mood. The findings also show that depressed mood is associated with subsequent perceptions of diabetes as a distressing experience.

Overall, using different measures and samples, these two studies show that there is an intricate reciprocal relationship between depressive symptoms and diabetes distress. They provide support for the notion that depression in diabetes should be considered in the context of living with and having to care for this chronic condition. However, because of their correlational nature, causal links between diabetes distress and depression cannot be assumed.

In a recent report of a RCT specifically targeting diabetes regimen distress, latent growth model tests indicated that changes in distress co-varied with changes in depressive symptoms, but that these changes were not causally related. This suggests there are unmeasured underlying variables associated with both diabetes distress and depression [22]. It was proposed that diabetes regimen distress and

depressive symptoms both reflected the latent construct of 'emotional distress', with the distress measure indicating the origins of the distress and depressive symptoms its severity. However, considering the reciprocity of depressive symptoms and diabetes distress, shown in the Ehrmann et al. and Burns et al. papers, the origins of the underlying 'emotional distress' concept linked to diabetes remains unclear.

It is important to be mindful that there is more than one underlying process contributing to depression (whether based on diagnostic interviews or by self-report) with cognitive, behavioural and environmental events interacting with diabetes-related factors. Low response-contingent positive reinforcement [23, 24] and disruptions of daily life due to diabetes and its consequences can reduce pleasure or enjoyment from valued activities contributing to depressive symptoms [25]. Stressful life events, including those related to diabetes [27] can trigger depression in people with pre-existing cognitive biases and distortions [26]. Research has also shown longitudinal associations between poor sleep, depression and stress [28] and between diabetes and poor sleep [29].

Although the epidemiological literature shows little support for a biological explanation for the incidence of depression in diabetes, biological factors related to diabetes are likely to interact with the above mentioned psychological processes. Current research, with a predominance of cross-sectional studies, has barely begun to disentangle these underlying interactions, which may have important implications for the treatment of depressed mood in people with diabetes.

While RCT studies have shown that targeting diabetes distress result in lower levels of depressive symptoms, they did not succeed in reducing in HbA1c or inflammatory markers [30,31]. Given the adverse effects of hyperglycaemia on brain functioning and synaptic plasticity [32, 33, 34], interventions should not neglect to simultaneously target glycaemic control.

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