Undoing Descartes: integrating diabetes care for those with mental illness

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Abstract
Diabetes UK has supported the concept of integrated diabetes care to ensure that the person with diabetes is seen by the right professional at the right time in the right place. At a time when diabetes teams are threatened by changes in the NHS, the division between mental and physical health services makes those with mental illness particularly vulnerable.

The association between diabetes and mental illness has been recognised for over 350 years. The prevalence of diabetes in people with depression and severe mental illness (schizophrenia and bipolar illness) is increased two- to three-fold. Furthermore, the proportion of people with undiagnosed diabetes is considerably higher than in the general population. The risk of complications and diabetes related mortality is higher in those with co-morbid mental illness.

Currently, diabetes services for people with severe mental illness lag behind those for people without mental illness; patients are less likely to be examined for eye or foot complications, less likely to be screened for glycated haemoglobin or cholesterol, and less likely to receive education.

Integration of care between mental and physical health services, whether in primary or secondary care, is essential if this health inequality is to be overcome. Perhaps only then can we bring body, mind and soul back together. Copyright © 2011 John Wiley & Sons.

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Introduction
The Mary MacKinnon lecture honours a remarkable woman who has played a major role in shaping the care of people with diabetes in the UK. Mary MacKinnon was born in London and trained as a nurse at St George’s Hospital where her first exposure to diabetes came on the diabetes and endocrinology ward after she completed her training. This was a long ‘Nightingale’ ward where the equipment for administering insulin was glass and metal syringes and needles, all of which had to be boiled and inspected to avoid needles with barbed ends.

After working in Hastings and a career break, Mary was appointed as a practice nurse in Sheffield. At the time, many people with diabetes had been discharged from hospital care and Mary found herself looking after them in her practice. She quickly realised that a major obstacle to care was the lack of knowledge of diabetes among both patients and professionals alike. She also became aware of the tensions between primary and secondary care and set about breaking down these barriers by working with Professor John Ward in the Hallamshire Hospital, persuading him to come out to the community. Furthermore, she undertook research to identify the needs of primary care.

On her return to clinical practice, she became the diabetes co-ordinator for Sheffield working out of the recently established diabetes centre, providing a better environment for people with diabetes. Towards the end of the 1980s, Mary was seconded to Diabetes UK (then the British Diabetic Association) where she established Primary Care Diabetes UK to help address the needs of those working in primary care. Mary remained committed to professional education and was responsible for setting up the Warwick Diabetes Course with Roger Gadsby in 1999 for general practitioners and their teams.
Mary developed diabetes herself in 1998; ironically it was diagnosed while she was training nurses in Cameroon how to monitor glucose. Despite the overwhelming emotion that accompanied her discovery, Mary used the opportunity to help the Cameroon nurses develop a management plan for her. Mary then established PROUD (Professionals United by Diabetes) to allow professionals who live and work with diabetes to share their experiences. For many years, Mary has been a great supporter of Diabetes UK. Following her work with Primary Care Diabetes UK, she chaired the 2004 annual professional conference where I first came to know her as the vice-chair on the committee. Later, Mary became the inaugural chair of the English Advisory Council, this time standing as a person with diabetes rather than as a health care professional.

Listening to Mary speak, it is clear her career has been driven by the principles of the importance of centrality of the person with diabetes, the importance of patient and professional education, and the importance of team working and seamless and continuous care that spans primary and secondary care. In many ways, she was a pioneer for the concept of the integrated care now espoused by Diabetes UK in the aphorism ‘the right care, in the right place, at the right time’.3

Challenges in the health service
To a certain extent, care within the National Health Service has never been truly integrated and has been criticised as operating in silos, making it difficult for patients to move from one setting to another. Changes over the last few years within the NHS seem to have exacerbated this problem. Concerns about the fragmentation of diabetes services were clearly expressed by respondents who took part in the recent series of surveys of UK specialist diabetes services undertaken by Diabetes UK and the Association of British Clinical Diabetologists.4

The latest plans for the NHS do not provide reassurance that this situation will improve with 89% of doctors in a recent British Medical Association survey believing that the proposed changes will lead to further disintegration of services.5

In a health service, where to a large extent no care is given unless requested, certain vulnerable groups, such as those with mental illness, may be disadvantaged by the current organisation of care. The Disability Rights Commission has highlighted that, instead of receiving holistic care, many people with mental illness describe how their physical illnesses are overshadowed by the mental illness, with health care professionals concentrating on the latter to the detriment of the former.5

Perhaps the origins of the separation between physical and mental illness can be traced back to René Descartes, the famous philosopher and mathematician (31 March 1596 – 11 February 1650). ‘Les Passions de l’ame’ (Passions of the Soul) published in 1649 describes the splitting of humans in ‘body’ and ‘mind’ or ‘soul’ the former.

Figure 1. René Descartes, the famous philosopher and mathematician (31 March 1596 – 11 February 1650). ‘Les Passions de l’ame’ (Passions of the Soul) published in 1649 describes the splitting of humans in ‘body’ and ‘mind’ or ‘soul’

Diabetes and mental illness
Mental illness is common, affecting one in 10 people at any time, while between 25–30% will develop a mental illness at some point during their lives.7 The World Health Organization predicts that, by 2030, depression alone will be the second leading cause of disability worldwide.8 Given the high prevalence of both diabetes and depression, a degree of co-morbidity is to be expected, but it is clear that mental illness occurs more commonly among people with diabetes than expected and vice versa.9–11 It is also clear that the co-morbidity worsens the prognosis of both mental illness and diabetes.

The association between mental illness and diabetes has been recognised for many years. In the 17th century, Thomas Willis, the famous anatomist and founding member of the Royal Society, described how ‘diabetes is a consequence of prolonged sorrow’.12 Much later, in 1879, Henry Maudsley made the link when he stated: ‘Diabetes is a disease which often shows itself in families in which insanity prevails. Whether one disease predisposes in any way to the other or not, or whether they are independent outcomes of a common neurosis, they are certainly found to run side by side, or alternately with one another more often than can be accounted for by accidental coincidence or sequence’.13 There have also been overlaps in the treatment of diabetes and psychiatric illnesses. Before insulin and antipsychotics were discovered, heroin was used to treat both conditions; a case report in 1898 describes how Monsieur Lepine gave heroin to a man with type 1 diabetes.14 ‘Of course, the patient was not cured, but he was evidently saved from an imminent attack of coma.’

Insulin transformed the lives of people with diabetes but was also used much less successfully by psychiatrists to treat psychotic illnesses.
Insulin coma therapy was introduced in 1933 and was used extensively in the 1940s and 1950s prior to the introduction of antipsychotics. While insulin was lifesaving in diabetes, many people with mental illness were killed by insulin induced hypoglycaemia; the reported mortality rates were 1–4.9%.15,16

**Depression**

The prevalence of depression is increased approximately two-fold in people with diabetes, whether assessed by self-administered questionnaires or by more rigorous diagnostic interviews. Depression has been traditionally viewed as an understandable reaction to the diagnosis of a lifelong condition that places both considerable lifestyle and treatment demands on the patient and is associated with long-term complications and shortened life expectancy. This view, however, is too simplistic as it is also clear that depression increases the risk of diabetes by ~60%.18

When depression is present in someone with diabetes, it not only impairs quality of life but also adversely affects diabetes outcomes.19 Depression is associated with poorer self-care behaviours; diet and exercise advice is followed less rigorously and patients are less likely to self-monitor their glucose or take medications as prescribed.20 Perhaps unsurprisingly, several cross-sectional studies have indicated poorer glycaemic control in people with depression.21,22

Depression is associated with an increase in the risk of both microvascular and macrovascular complications23 and, even if relatively mild, is associated with shortened life expectancy.24

**Severe mental illness**

The prevalence of diabetes in people with severe mental illness is increased two- to three-fold compared with the general population; in Europe and the USA ~10–15% of people with schizophrenia and bipolar affective disorder have diabetes and on average its onset occurs about 10 years earlier.11,25 Furthermore, the prevalence of undiagnosed diabetes is also much higher in people with severe mental illness, approaching 70% of all cases of diabetes. Unlike depression, the relationship appears to be unidirectional as there is no evidence that diabetes predisposes to either schizophrenia or bipolar disorder.

Similar to depression, co-morbid severe mental illness adversely affects the management of diabetes. People with schizophrenia are 74% more likely to develop acute diabetes complications and are more likely to develop microvascular and macrovascular complications.26,27 Diabetes related death is also reported to occur six times more frequently.

**Why does mental illness predispose to diabetes?**

There may be many reasons for the increased prevalence of diabetes in people with mental illness, including genetic and lifestyle factors as well as disease specific and treatment effects (Figure 2).28 The genetic associations, alluded to by Henry Maudsley in the quotation above, have been confirmed by more recent studies that have shown that diabetes or intermediate levels of hyperglycaemia are more common in family members of people with schizophrenia; furthermore, genome-wide association studies have suggested a shared genetic linkage between severe mental illness and diabetes.29 People with both depression and severe mental illness are more likely to be sedentary and eat diets that are rich in saturated fats and refined sugars while avoiding fruit and vegetables.30,31 Other common environmental factors, which include the early nutritional environment, urbanisation and socio-economic class, may increase the risks of both diabetes and mental illness.

It remains unclear whether mental illness per se increases the risk of diabetes, but there are biological changes during mental illness that may increase insulin resistance: for example, cortisol and catecholamine secretion increases as does the circulating concentration of a number of inflammatory cytokines, such as interleukin-6 and tumour necrosis factor-alpha.32,33

One of the most controversial subjects in this field is the degree to which psychotropic medication contributes to the risk of diabetes.34 The evidence base is incomplete and there is a dearth of high quality randomised controlled trials examining the effects of psychotropic medication on metabolic measurements.

There are, however, preliminary data to suggest that antidepressants might increase diabetes risk.35,36 A recent nested case-control study from Finland found that people using antidepressants continuously had twice the risk of diabetes although this study was unable to disentangle the contribution of the antidepressant from other aspects of the illness.35 A UK nested case-control study of people with depression found an 84% increased risk of diabetes in people with recent long-term use of antidepressants with no difference between selective serotonin reuptake inhibitors (SSRIs) and tricyclic antidepressants.36 Certain combinations of antidepressants, such as SSRIs and tricyclic antidepressants, may increase the risk of diabetes further, but this finding may be explained by a higher diabetes risk in people with more severe depression who are more likely to need combination therapy.37 Finally, certain antidepressants, for example, mirtazapine, may precipitate weight gain.38

The evidence linking antipsychotics with the development of diabetes is stronger; there are case reports of individuals developing diabetes, including diabetic ketoacidosis, shortly after the start of antipsychotic treatment and sometimes diabetes enters remission if the treatment is stopped.34 Large pharmaco-epidemiological studies also suggest that antipsychotics are associated with a small increase in diabetes risk but randomised controlled studies have not confirmed this.39,40 Nevertheless, antipsychotics are associated with weight gain and dyslipidaemia as well as small changes in glucose, suggesting that with prolonged treatment an effect on diabetes cannot be excluded.41,42

Overall, the evidence would suggest that, while there may be a causative link between antipsychotics and diabetes, most people...
receiving antipsychotics will not develop diabetes and, of those who do, most will develop diabetes for other reasons. The diabetes risk must also be balanced against the effectiveness of these treatments in allaying psychiatric symptoms and improving life expectancy.

Management of depression in people with diabetes

Diagnosis of depression

The first step to the effective management of depression is its recognition and diagnosis. Although there are many short questionnaires to screen for depression, only a few have been adequately evaluated for people with diabetes (Table 1). Certain symptoms, such as lethargy or weight change, are common to both conditions and so questionnaires that rely on these questions can overestimate depression. The Patient Health Questionnaire (PHQ-9) is widely used in UK primary care but an alternative, easy and simple method that can be used in a diabetes clinic is to ask two simple questions:

- ‘During the past month, have you been bothered by having little interest or pleasure in doing things?’
- ‘During the past month, have you been bothered by feeling down, depressed, or hopeless?’

If the answer to either is ‘yes,’ the patient should be asked if they want help with this problem. If the answer to this is also ‘yes,’ then the patient should be formally assessed by a diagnostic interview and offered appropriate treatment.

Treatment of depression

Treatment should be determined on an individual basis but may involve either psychological therapies or antidepressant medication. Both of these treatment modalities are effective in treating the depressive symptoms and a meta-analysis has recently shown that they may also improve diabetes outcomes. Psychological therapies appear more efficacious in this latter regard, possibly because they offer the person with diabetes the necessary skills and knowledge to manage their diabetes more effectively.

While all pharmacological treatments are effective in treating depression when used in adequate doses, SSRIs are the treatment of choice because they are associated with fewer cardiovascular side effects, particularly in overdose. Certain antidepressants, such as mirtazapine and paroxetine, appear to be associated with greater weight gain than other antidepressants and ideally should not be used as first line treatment.

The optimal management for people with co-morbid diabetes and depression requires an equal emphasis on both physical and mental disorder. Poor metabolic control, low rates of blood glucose self-monitoring and the presence of diabetes complications are all predictors of an inadequate response to depression treatment, and so should be addressed as part of the psychological management.

While referral to psychiatry services may be required, it is essential that diabetes teams know how to recognise depression and begin treatment. A recent survey by Diabetes UK found that only approximately a third of services had access to specialist psychological services. Similarly, 81% of expert providers felt under-resourced to meet patient psychological needs because of the demand. More worryingly, unlike many other aspects of care that have improved over the last 10 years, the provision of psychological support has reduced over the same time. The implication of this is clear; most psychological care will be provided by primary care or diabetes teams and extra training and awareness are needed to give the health care professionals the necessary skills to achieve this. Furthermore, there is an urgent
need to campaign for greater access to psychological services, not least because non-specialists can provide better care if expert psychological support is available.

**Clinical implications for those with severe mental illness**

Given the increased prevalence of diagnosed and undiagnosed diabetes in people with schizophrenia or bipolar illness, there is an imperative to screen for diabetes in people with severe mental illness. This is recognised in a number of national and international guidelines; yet, although there are subtle differences in detail, largely the guidelines are consistent in recommending screening for diabetes with fasting or random glucose before treatment is started, two to three months later (to identify the small number who develop diabetes rapidly with antipsychotics) and then on an annual basis. Following the WHO recommendation that diabetes can also be diagnosed by 

HbA1c, it would also be reasonable to screen with this measure.

Despite these guidelines, many people with severe mental illness are not being screened for diabetes. In the UK, the National Institute for Health and Clinical Excellence (NICE) guidance is clear that the responsibility for screening for physical health problems lies within primary care; yet, despite this there is still a lack of clarity among mental health care professionals about whose responsibility it is. Mental health care professionals have also expressed concern about their lack of understanding about what should be measured and when and lack confidence in interpreting results. Lack of access to necessary equipment is a further barrier.

**Diabetes prevention**

It is important to develop strategies to reduce diabetes risk in people with severe mental illness. Recent trials in high risk individuals in the general population have shown the importance of lifestyle modification in the prevention, or at least delay, of type 2 diabetes. Despite these results and those of pragmatic ‘real world’ studies which suggest that it is possible to translate these interventions into everyday clinical practice, there are significant challenges in achieving behaviour change. This has led to a degree of nihilism when lifestyle modification is considered for people with severe mental illness. Contrary to expectation, however, many people with severe mental illness are willing and able to make dietary and exercise changes, provided they receive adequate education and support.

The results of both observational and randomised controlled trials would suggest that lifestyle programmes are at least as effective in people with severe mental illness as in the general population. Where lifestyle modification is not feasible or ineffective, short-term studies have suggested that metformin may be a reasonable second line therapy leading to either weight loss or attenuated weight gain. Consequently, the joint European societies have recommended that ‘...metformin may be considered in patients with additional risk factors, such as a personal or family history of metabolic dysfunction’. Management of diabetes

If a person with severe mental illness develops diabetes, it is important that there are effective care pathways to ensure that they receive high quality care from a diabetes team. The literature suggests that people with severe mental illness are disadvantaged in many health systems; they are less likely to receive screening for microvascular complications, measures of glycaemic control, diabetes education and cardiovascular prevention medications.

One exception to this general rule was a UK primary care study which found that people with severe mental illness received equivalent care to the general population; the authors speculate that the Quality and Outcomes Framework (QOF) may have acted as an incentive to improve care.

The principles of management of the diabetes are the same as for the general population but, without adequate control of the psychosis, empowerment of the patient to take on self-management is nigh on impossible. It is therefore a prerequisite that the mental illness is treated effectively. For this reason, in many circumstances, it is inappropriate to stop or change antipsychotic with the onset of diabetes; however, in cases where diabetes develops rapidly following the initiation of antipsychotic medication, the diabetes may resolve if the treatment is stopped or changed, provided the treatment change can be made without upsetting the control of the mental illness.

**Conclusion**

The final word of this article must go to Mary MacKinnon, who said: ‘I would like to look after people, and make sure they got the right sort of care when they were ill.’ The clinically important association between diabetes and mental illness leads to substantial morbidity in those with both illnesses. It is vital that all diabetes health care professionals, whether in primary care or a specialist diabetes team, are able to recognise the problem and take appropriate steps to reduce the burden of both diseases for their patients. A close liaison between psychiatry, diabetes and primary care services would appear essential to achieve this.

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