Diabetes and dementia: The implications for diabetes nursing

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Article points

1. The risks of diabetes and dementia both increase with age and with common lifestyle risk factors, and thus the two conditions are becoming increasingly prevalent.
2. People with both diabetes and dementia are at risk of hypoglycaemia and hyperglycaemia if memory loss affects their eating and medication routines, and cognitive impairment can affect many other aspects of diabetes management.
3. The focus for management of people with the two conditions is safety, with the balance weighted towards avoiding hypoglycaemia rather than achieving tight glycaemic control, and simplicity, along with individualisation to account for the person's ability to self-care.

Key words

- Dementia
- Diabetes

Authors

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Type 2 diabetes and dementia are increasing in prevalence, as they are both associated with ageing and the population as a whole is living longer. Individuals who have both conditions will have very complex needs. People with diabetes are more likely to develop dementia than the general population. This may be due to possible genetic links; however, both conditions share common lifestyle risk factors. The diagnosis of diabetes may be delayed in an individual with dementia for a number of reasons. Conversely, the development of dementia in someone with diabetes has significant implications for self-management. The focus of treatment for people with diabetes and dementia is safety, particularly avoidance of hypoglycaemia, as well as maintaining independence and use of self-management skills as far as possible. The staff caring for people with diabetes and dementia should be appropriately trained.

Nurses working in diabetes are well aware of the explosion in the diabetes population and the implications this has had on workload, working practice and pressure on resources. The number of people with diabetes has doubled since 1996, with 3.2 million people diagnosed and an estimated 630 000 undiagnosed in the UK (Diabetes UK, 2014). Diabetes prevalence in the UK is expected to reach 5 million by 2025.

The number of people with dementia is also rapidly increasing, with an estimated 850 000 people living with the condition in the UK and this figure set to reach over 1 million by 2025 (Alzheimer's Society, 2014). The proportion of people with dementia doubles for every 5-year increase in age from the age of 30 years, and one in 14 people aged 65 years or older have dementia. Overall, 70% of people living in care homes have dementia or severe memory loss.

As the prevalence of both type 2 diabetes and dementia increases with age, one of the costs of an ageing population is a growing proportion of people with both diabetes and dementia. Diabetes care will become more complex as people age and develop other comorbidities like dementia. Diabetes nursing will need to adapt to this and nurses will require a more diverse set of skills to care for this population.

Diabetes and dementia

The combination of diabetes and dementia is not just related to the ageing population. Although a link between diabetes and dementia has been recognised for many years, the risk of developing both conditions and the underlying processes are not clear. Biessels et al (2006) suggested that, although the relationship between the two conditions is controversial, the incidence of dementia is higher in people with diabetes, possibly owing to alterations in glucose, insulin and amyloid metabolism. A prospective,

population-based cohort study of 6370 older people showed that diabetes almost doubled the risk of developing dementia, with insulin users having the highest risk (Ott et al, 1999). The actual risk of developing dementia in people with established diabetes is not clear, however. Tolppanen et al (2013) found that, while people with Alzheimer's disease were more likely to have a history of diabetes than the general population, the difference was small. The association between the two conditions has now hit the headlines; the 2014 Alzheimer's Association International Conference was reported in *The Telegraph* with the opening line: "People who suffer from diabetes have a 50 per cent increased risk of dementia" (Donnelly, 2014). Although there may also be a genetic link, dementia and type 2 diabetes share common lifestyle and health risk factors, including smoking, excess alcohol intake, obesity, hypertension and raised cholesterol levels (Alzheimer's Society, 2012).

Both conditions have the same issues with regard to early diagnosis. Dementia was identified as a health priority in 2012 (Department of Health, 2012), and efforts have been made to raise awareness of the condition and increase the availability of information and access to comprehensive assessment and formal diagnostic services. It has been estimated, however, that only 44% of people with dementia are diagnosed in England, Wales and Northern Ireland (Alzheimer's Society, 2013). The early identification of people at risk of developing diabetes was addressed by NICE (2012). Both conditions are very costly to the NHS; diabetes treatment consumes almost 10% of the NHS budget, but the total costs (both direct and indirect) have been estimated at £23.7 billion per annum (Diabetes UK, 2015). Dementia is estimated to cost £26 billion per annum (Alzheimer's Society, 2014).

Regarding diagnosis and management of dementia, three Quality Standard documents have been produced by NICE: QS1, QS30 and QS50 (NICE, 2010; 2013a; 2013b).

Diagnosing dementia

There are over 100 types of dementia, the most common being Alzheimer's disease and vascular dementia (Alzheimer's Society, 2014). The early signs and symptoms include forgetfulness, repetitiveness, short-term memory loss and difficulty in finding the right words. As the condition progresses, episodes of disorientation, getting lost, and difficulty managing social situations and daily living become more frequent. Reasoning becomes impaired and the individual struggles to make decisions. Advanced dementia results in the loss of those skills learnt at an early age, resulting in incontinence, inability to care for or feed oneself and complete dependence on others.

An example of a screening tool for dementia in people with diabetes is the Mini-Cog™ test, which has 83% accuracy (Sinclair et al, 2013). In the test, the participants are shown three items and asked to name them. These are then hidden from view. Participants are then asked to draw the numbers in a blank clock face and put the hands at, for example, ten to three. Finally, they are asked to recall the three items shown before they drew the clock. For formal diagnosis, referral to a memory assessment service for a number of tests, including a brain scan and electroencephalogram, is required (NICE, 2010).

Implications for people with dementia who develop diabetes

If people with dementia are unable to recognise or communicate symptoms of diabetes, the diagnosis may be missed or delayed. Worsening confusion from dehydration caused by hyperglycaemia-induced diuresis may be attributed to the progression of dementia. The frequent need to urinate increases the risk of falls or development of incontinence if an individual forgets where the toilet is. Significant changes in diet and the need for blood glucose monitoring or insulin injections may cause distress if the individual is unable to understand that they have diabetes.

Implications for people with existing diabetes who develop dementia

The loss of short-term memory increases the risk of hypoglycaemia in people who are treated with sulphonylureas, glitinides and insulin if they forget to eat regularly or forget that they have taken medication and take it again. Conversely, poor memory increases the risk of hyperglycaemia if they forget to take medication or forget they have already eaten and eat again. In addition, dementia

Page points

1. Diabetes and dementia are closely linked, as they share common lifestyle factors and health risks, including smoking, excess alcohol intake, obesity, hypertension and raised cholesterol levels, and there may even be a genetic association.
2. As with diabetes, early diagnosis of dementia is important. The Mini-Cog™ test, which has an accuracy of 83%, can be used as a screening tool for the condition, supported by referral to a formal memory assessment service to confirm the diagnosis.
3. People with dementia who develop diabetes may be unable to recognise the symptoms, and signs of hyperglycaemia may be incorrectly attributed to worsening of dementia. Conversely, people with diabetes who develop dementia are at greater risk of hypoglycaemia and hyperglycaemia.

Table 1. Diabetes-specific considerations in the care of people with diabetes and dementia.

Safety	Agreeing appropriate targets for blood glucose levels and HbA_{1c} (see Management section of this article)
	Reducing risk of hypoglycaemia by avoiding insulin, sulphonylureas and glitinides, if possible
	Simplifying medication regimens (e.g. daily long-acting basal analogue insulin that can be given by a community nurse at a time that fits in with other care provision)
	Supporting carers to give insulin safely
	Training carers to recognise hypoglycaemia and to treat promptly and appropriately
	Recognising problems with nutrition (e.g. swallowing, recognising cutlery)
Cognitive ability	Recognising what the person is still able to do (e.g. give their own insulin injections after the dose has been checked) and supporting them to continue with this while they still can
	Supporting carers in supervising blood glucose monitoring and insulin delivery
Biography	Be aware of how long they have been living with diabetes.
	Establishing what their diabetes routines were when they managed it themselves (try to maintain familiar routines where possible)
Personality	Changes in usual behaviour may indicate hypoglycaemia
	Being aware of preferences for certain routines and foods. This will improve quality of life
Communication	Communication difficulties that the person may have
	Use a calm tone, give small amounts of information, maintain eye contact, make time for the individual to answer

causes a number of abnormalities that impact people's ability to manage their diabetes as follows:

- Agnosia – unable to recognise cutlery, food, insulin devices and blood glucose meters.
- Dysphasia – unable to say they are hungry or feel hypoglycaemic.
- Dysphagia – problems with chewing and swallowing, resulting in poor nutrition and weight loss. There will need to be consideration of appropriate treatments for hypoglycaemia.
- Dyspraxia – clumsiness results in an impaired ability to prepare food, use utensils and use blood glucose meters or insulin devices.
- Executive dysfunction – loss of the ability to reason and make decisions affects the ability to plan preparation of food, interpret blood glucose readings and adjust insulin doses appropriately.
- Memory – this will impact all aspects of diabetes management, including remembering to attend appointments, take insulin, monitor blood glucose levels and treat hypoglycaemia correctly.

Finally, if people have managed their diabetes for many years, becoming dependent on others to manage it can result in a real sense of loss, as well as frustration if they are not permitted to continue with aspects of care that they still feel able to manage.

Management

The focus for management of people with both diabetes and dementia is safety and simplicity, along with individualisation to recognise the ability to self-care. NICE (2010) recommends that people with dementia should have an assessment and personalised care plan and that, given the progressive nature of diabetes and dementia, these should be regularly appraised and updated. The care plan should be shared with everyone involved in the individual's care, including during hospital admission. *Table 1* suggests some of the diabetes-related considerations for such a care plan.

The European Diabetes Working Party for Older People has developed guidelines for appropriate blood glucose targets in older people (Sinclair et al, 2011). These take into account the likely benefits of tight glycaemic control in contrast to the individual risks to the person, their vulnerability to hypoglycaemia, their ability to self-manage, the presence of other pathologies, their cognitive status and their life expectancy. An HbA_{1c} of 53–59 mmol/mol (7.0–7.5%) is suitable for an older person who is well and independent, whereas 60–70 mmol/mol (7.6–8.6%) would be appropriate for someone who is frail (defined as dependent with multiple comorbidities, dementia and living in a care home).

Simplification of the insulin regimen may be difficult in certain individuals. A single daily basal insulin injection would be insufficient for someone with type 1 diabetes or long-standing type 2 diabetes. A certain amount of flexibility may also need to be built into insulin management plans

to accommodate episodes of increased activity (for example, wandering) or refusal of food. Achieving this safely depends on the competency of the carers involved with the person and requires comprehensive training and supervision.

The first statement in the NICE QS1 document recommends that all people with dementia be looked after by staff who have been appropriately trained, and it gives a list of what this should entail (NICE, 2010). Additional skills are required if the individual also has diabetes (TREND-UK, 2011; 2013). People with both conditions are vulnerable and have very complex needs, yet they may be living in care homes with staff who have inadequate training. NICE (2013b) also recognises that these people may have poor access to NHS services, including a GP, and gives recommendations to address this.

Conclusion

Type 2 diabetes and dementia are increasingly common as they are both associated with increasing age and, as people become older, they are more likely to have both conditions. This has significant implications for self-management of diabetes and also safety when using agents that cause hypoglycaemia. Thoughtful use of medications and agreeing appropriate glycaemic targets, comprehensive training of carers and the development of dynamic care plans that incorporate residual self-management skills are some of the aspects of care that diabetes nurses will be involved in when caring for people with diabetes and dementia. ■

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