Diabetes care for older people: A practical view on management

Alan Sinclair

Diabetes can impose a substantial health burden on older people and their informal and formal carers. If there is evidence of sub-optimal care planning, a lack of empowerment, or under-skilling of those delivering direct diabetes care to this group, independence of the individual will be under threat. This substantially increases the risk of a serious adverse outcome, for example hospital or care home admission. This article identifies the specific needs, treatments and assessments for functional loss and depression in older people with diabetes living in the community, those living in care homes and those in hospital. It also looks at end-of-life care and managing hypoglycaemia.

In Europe, type 2 diabetes affects 10–30% of people above pensionable age (DECODE [Diabetes Epidemiology: Collaborative Analysis of Diagnostic Criteria in Europe] Study Group, 2003), and in the USA, about 40% of all those with diabetes (McBean et al, 2004). The prevalence of diabetes in care homes in the UK is also 25% (Sinclair et al, 2001). Among people aged over 60 years from NHANES (National Health and Nutrition Examination Study; Harris et al, 1998), Mexican-Americans showed a consistently higher prevalence of diabetes than non-Hispanic white and black people.

Evidence suggests that older people with diabetes use primary care services two to three times more than their counterparts without diabetes (Damsgaard et al, 1987). The demands of hospital care are also increased two to three times in those with diabetes compared with an aged-matched non-diabetes population, with more frequent clinic visits and a five-fold higher admission rate (Damsgaard et al, 1987). Acute hospital admissions account for 60% of total expenditure in this group (Krop et al, 1998). Some 5–8% of general hospital beds in the UK are occupied by people with diabetes aged ≥60 years, accounting for 60% of all inpatients

Learning objectives

After reading this article, the participant should be able to:

1. Treat older people with diabetes with an emphasis on dignity, safety, quality of life and wellbeing.

2. Describe the cognitive and geriatric assessment process.

3. Discuss the diagnosis and treatment of depression in older people with diabetes.

4. Describe the optimisation of diabetes therapy in older people with diabetes, taking into account the risk of falls and hypoglycaemia.

Key words

- Carers
- Depression
- End-of-life care
- Functional impairment
- Hypoglycaemia

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Box 1. Major aims in managing older people with diabetes.

Medical
- Balance safety and risk by aligning therapy to metabolic disturbance and individual needs.
- Minimise polypharmacy.
- Prevent undesirable weight loss.
- Avoid hypoglycaemia and other adverse drug reactions and interactions.
- Detect cognitive impairment and depression and functional disabilities at an early stage.
- Avoid unnecessary hospital admission.

Patient-oriented
- Maintain general wellbeing, good quality-of-life, and independent living.
- Preserve dignity and safety.
- Acquire skills and knowledge to adapt to lifestyle changes.
- Encourage diabetes self-care.
- Risk management, for example to reduce risk of falls.
- Maintain optimal physical and mental performance.
- Achieve a normal life-expectancy where possible.

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with diabetes (Hudson et al, 1995). Hospital admissions last twice as long for older people with diabetes compared with controls, with the totals averaging 7 and 8 days per year for men and women, respectively (Williams, 1985).

Diabetes care themes that apply to older people across all clinical settings include:
- A clinician mindset that aims to find a diagnosis for illness-related symptoms and provide reasonable care based on the individual's needs.

Box 2. Factors that may influence diabetes management in older people.

- High medical comorbidity levels.
- Frailty and limited life-expectancy.
- Physiological ageing and lowered counter-regulation to hypoglycaemia.
- Higher frequency of depressive illness or cognitive impairment.
- Care home residency.
- Reliance on informal or formal carers.
- Increased risk of adverse events from multiple medications.

Box 3. Characteristics indicative of special needs in older people with diabetes.

- Varying evidence of impaired physical function and walking ability.
- Increased vulnerability to hypoglycaemia and increased risk of hospital admission.
- Increased risk of cognitive dysfunction and mood disorder, making decision-making more difficult for healthcare professionals.
- Increased risk of hospital and care home admission.
- Increased risk of inpatient mortality.

- A major emphasis on dignity, safety, quality of life and wellbeing for each individual.
- The early and effective use of interventions that can be applied in community settings.
- A commitment to improving or maintaining independence and functional status.
- The avoidance of ageism and a reductionist approach to care.

Influencing diabetes management in older people: Defining key aims and identifying needs

The key aims and needs for the management of older people with type 2 diabetes are presented in *Box 1* and can act as a template for developing a care plan. The care plan should be individualised and assessed regularly, as the status of older people can change quickly. Apart from social isolation, other socioeconomic factors and varying family dynamics, other issues may operate and influence management (*Box 2*).

The management of type 2 diabetes is often complicated in older people because of the added effects of ageing on metabolism and renal function, the use of potentially diabetogenic drugs and low levels of physical activity. Cardiovascular risk is particularly high because many risk factors of the "metabolic syndrome" can be present for up to a decade before type 2 diabetes is diagnosed (Alberti et al, 2005). Older people with diabetes have a set of characteristics that reveal a pattern of special needs (*Box 3*).

Functional impairment in diabetes and the role of comprehensive geriatric assessment

Diabetes is associated with both functional impairment and disability, which cannot be solely accounted for by vascular disease. Metabolic disturbance, medication effects, and nutritional deficits may superimpose to exacerbate functional loss.

A number of studies have identified diabetes as a predictor of functional decline (Gregg et al, 2000a; Volpato et al, 2002; Sinclair et al, 2008), which can be manifested by changes in activities of daily living (ADL), domestic and leisure abilities or cognitive tests. Falls and

fall-related fractures are a source of enormous morbidity and resultant disability. In people with diabetes, the increased risk of falling is nearly three-fold, and they have a two-fold increase in having a fall that is injurious, with fall-related fractures being more common in women (Schwartz et al, 2002). Factors contributing to falls include problems with gait and balance as well as neurological and musculoskeletal disabilities. Environmental factors, such as tripping on rugs, or ill-fitting slippers can also play a role.

In addition, in people with diabetes, the high rate of cardiovascular disability, visual deficit, cognitive impairment and treatment-related issues are likely to contribute. Insulin treatment significantly increases the risk of falling in older women with diabetes (Bonds et al, 2006). Factors that may be implicated in the risk of falls are the duration and severity of the diabetes or possibly a higher rate of hypoglycaemia, which might be unrecognised. Clinicians involved in managing older people with diabetes must directly question them about the occurrence of falls and provide an estimate of risk. They may require an education review or further education. It is important that the teaching method is appropriate to the person's learning style and accounts for cognitive and memory deficits.

Encouraging people to take an active part in lifestyle modification, including rehabilitation, can foster their autonomy, improve their self-esteem and coping skills, and reduce the anxiety and depression associated with disability and functional decline.

It is also important to identify individuals who would appropriately be labelled as frail because the aims of care are modified for such people. Frailty, in this context, represents a vulnerability to a wide range of adverse outcomes secondary to the effects of ageing, long-term vascular complications of diabetes, physical and cognitive decline, and the presence of other medical comorbidities. Healthcare professionals are often able to define a series of factors, such as recurrent hypoglycaemia, cardiac disease, and reduced recovery from metabolic decompensation that underly a frailty state (Sinclair, 2000).

The annual review process should include an assessment of basic measures of ADL function, such as: a Barthel test; tests of cognitive function, such as the Mini-Mental State Examination (MMSE) or Clock Test; a screen for depression, such as the Geriatric Depression Score; and an assessment of gait and balance, which can be simply estimated by the timed "Get Up and Go" test. This involves asking the individual to stand from a chair that has armrests, walk 3 metres, turn, walk back to the chair, and sit down. If this takes longer than 30 seconds, there is evidence of impaired mobility. People with major mobility or falls disorder require referral to a local therapy centre where physical therapy and occupational therapy are available, or to a geriatrician, preferably one who has an interest in diabetes and falls disorder.

Nutritional assessment using the "MUST" (malnutrition universal screening tool) is an important and relatively quick method of assessing nutritional status and must form part of the assessment procedures. This integrated process of assessment – comprehensive geriatric assessment – is suitably applied to diabetes in *Box 4*.

Role of carers in diabetes care

There is increasing recognition that informal (unpaid) carers provide considerable, if not the majority of, community-based care in domestic settings and this need is likely to increase dramatically over the next 25 years

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Box 4. Criteria for referring people with type 2 diabetes for comprehensive geriatric assessment.

- Presence of a geriatric syndrome: confusional state, depression, falls, incontinence, immobility, pressure sores.
- Presence of several coexisting morbidities apart from diabetes with complex drug regimens.
- Presence of disabilities resulting from lower-limb vascular disease or neuropathy requiring a rehabilitation programme in the absence of a terminal illness or dementing syndrome.
- Increasing frailty.

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CPD module

(Sinclair et al, 2010). At the same time, they appear to be greatly affected by the burden of this responsibility, including lost earnings (as many carers are in the working age category) and an increased risk of depressive illness.

Apart from direct diabetes care roles, informal carers have a wide range of other care responsibilities including skin and wound care, medication management, dietary provision, financial care and even in-home dialysis where needed. Factors such as other chronic diseases or the presence of physical disability, falls and fractures, or dementia are likely to impose a particularly heavy burden. Carers are also likely to be partners or spouses of the person with diabetes and may have their own health requirements or need diabetes education.

Reports also suggest that a particularly heavy burden is borne by informal carers among black and minority ethnic groups (Sinclair et al, 2010). Their burden may involve issues such as greater lack of access to services, problems relating to living within poor inner-city environments including poverty and overcrowding, and difficulties in accessing care home placements are more prominent.

Based on the available evidence in relation to care-giving roles in both white and ethnic populations, *Box 5* contains a summary

of the optimal content of informal carer "support packages" that should be of special importance in areas with high diabetes prevalence in ethnic groups. This information needs to be individualised and presented in an appropriate way.

Language difficulties and health literacy (Nutbeam, 2000) remain important issues since they can hinder trust among people with diabetes and healthcare professionals, increase the likelihood of staff failing to recognise complexity in an individual and decrease adherence to therapy (Rivadeneyra et al, 2000).

It is important to ensure that the information and instruction provided in the "support package" is translatable into relevant languages, is simple and easy to read and appropriately illustrated. It should also be sensitive to the cultural, educational, religious and ethnic issues for each group of people and be designed to empower individuals to successfully manage their diabetes and other healthcare issues.

Diabetes and cognitive performance

Diabetes and cognitive dysfunction are related (Gregg et al, 2000b; Sinclair et al, 2000). Impaired cognitive function has been demonstrated in older people with diabetes, but these studies were mostly not population based, excluded people with dementia, and generally used a large battery of tests to show the deficit.

Impaired glucose tolerance has been shown to be associated with cognitive dysfunction. It has been suggested that certain components of the metabolic syndrome may each contribute to memory disturbance in type 2 diabetes abnormalities, and that hyperinsulinaemia is associated with decreased cognitive function and dementia in women (Sinclair and Asimakopoulou, 2009). The overall risk of dementia is significantly increased for both men and women with type 2 diabetes; excess risk for Alzheimer's disease achieved significance in men only (Sinclair and Asimakopoulou, 2009). Poor glycaemic control may be associated with cognitive impairment, which recovers following improvement in glycaemic control.

Impaired cognitive function may result in poorer adherence to treatment, worsen

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Box 5. A summary of the optimal content of informal carer "support packages" (Sinclair et al, 2010).

- Information about the basic essentials of diabetes as a medical disorder.
- Practical guidance on the following:
  - Monitoring of blood glucose and urinary glucose.
  - Insulin administration where appropriate.
  - Dietary advice.
  - Exercise and lifestyle "desirable" practices.
  - Carer management of hypoglycaemia, worsening glycaemic control of the person with diabetes, and management of "sick days".
- Information about local diabetes teams and other healthcare professionals involved in diabetes care, including contact persons and telephone numbers.
- Information about community and neighbourhood services and social services that are available locally to support older adults with diabetes from varying ethnic backgrounds and their informal carers.
- Information about local ethnic diabetes support groups, which can provide further information and advice regarding living with diabetes and the caring role, and provide a forum and link for networking in any one area.

glycemic control due to an erratic diet and medication schedule, and increase the risk of hypoglycemia if individuals forget that they have taken their blood glucose-lowering medication and repeat the dose. Depending on its severity, cognitive dysfunction in older people with diabetes may remain undiagnosed and have considerable implications that include increased hospitalisation, less ability for self-care, less likelihood of specialist follow-up, and increased risk of institutionalisation. Clinicians must be prepared to refer people for specialist assessment if memory loss or behaviour change becomes an issue.

Depression and diabetes

Depression and diabetes are common in an ageing community and there is evidence of an association (Eaton et al, 1996; Egede at al, 2002). A major depressive disorder appears to significantly increase the risk of diabetes (Maraldi et al, 2007), and the presence of depression is an important indicator of subsequent death in people with diabetes admitted into hospital (Nouwen and Oyebode, 2009). Depression occurs in up to a quarter of people with cardiovascular disease and diabetes, and in both cases, clinical outcomes are worse (Nouwen and Oyebode, 2009).

Failure to recognise depression can be serious and may be associated with worsening diabetes control and decreased treatment adherence. Diabetes and depression may share similar symptomatology, for example fatigue, irritability and sexual dysfunction. This may delay or confuse the diagnosis, although the commonly used diagnostic assessment scales are still likely to be valid. Enquiries about wellbeing, sleep, appetite and weight loss should be part of the routine history, with a more comprehensive psychiatric evaluation if appropriate.

A Geriatric Depression Scale score of >5 can indicate probable depression. Other scales to be considered include the two-question test by NICE (2009a) or the World Health Organization-5 Well-Being Index (Henkel et al, 2003).

Depression in diabetes can be treated successfully with pharmacotherapy or psychological therapy, but blood glucose levels should be monitored closely, especially with pharmacotherapy. Goals for treating people with depression and diabetes are two-fold: first, remission or improvement of depressive symptoms and, second, improvement of poor glycaemic control if present. The preferred first-line treatment is a selective serotonin reuptake inhibitor (SSRI) or a serotonin noradrenaline reuptake inhibitor (SNRI), and psychotherapy. Treatment with SSRIs, such as fluoxetine, may improve symptoms and consequently metabolic control although close observation for side-effects and changes to glycaemic control are needed (Nouwen and Oyebode, 2009).

Diabetes in care homes

Between 7% and 27% of care home residents in the UK and USA have diabetes (Sinclair et al, 2001). The wide range is partly because of differences in the diagnostic criteria used and the prevalence of impaired glucose tolerance may be as high as 30%. People with diabetes in care homes should receive care commensurate with their health and social needs. The best possible quality of life and wellbeing should be maintained, without unnecessary or inappropriate interventions, while helping residents to manage their own diabetes wherever feasible, reasonable and appropriate.

Metabolic control should reduce both hyperglycaemic lethargy and hypoglycaemia, with a well-balanced dietetic plan that prevents weight loss and maintains nutritional wellbeing. Foot care and vision require screening and preventative measures to maintain mobility and prevent falls and unnecessary hospital admissions.

At present, residents with diabetes in care homes appear to be generally vulnerable and neglected, with high prevalences of macrovascular complications and infections (especially skin and urinary tract), frequent hospitalisation, and much physical and cognitive disability. Known deficiencies of diabetes care include lack of individual management care plans and dietary supervision,

Page points

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infrequent review by specialist nurses, doctors and ophthalmologists, and poor knowledge and training for care staff.

Various strategies may improve diabetes care in this setting (see *Box 6*). New national clinical guidelines are now available (Diabetes UK, 2010).

End-of-life care issues

Any clinician regularly involved in delivering diabetes care in older people will face one or more end-of-life care (EOLC) scenarios in their patient population each year. Each of these episodes require the clinician to demonstrate knowledge of key palliative care principles, skill in revising goals of diabetes care, and a compassionate understanding of what the individual with diabetes is experiencing.

The recent launch of the Association of British Clinical Diabetologists' (ABCD) position statement (Kilvert et al, 2010) demonstrates a commitment by diabetes specialists to integrate important EOLC pathways into diabetes teamwork. This requires close working with community-based teams and primary care. As stated in the ABCD guidance (Kilvert et al, 2010):

"The multidisciplinary diabetes team will need to be proactive in recognising the onset of a patient's terminal decline in health and liaising with the appropriate EOLC services. Services will be based around high quality EOLC, symptom management, and the provision of psychosocial support. There will be an agreed set of criteria to identify those who require urgent palliative care, support worker responses in different situations, e.g. unresolved pain, rapid discharge from hospital, or care breakdown at home".

Issues that need to be addressed include adjusting glycaemic targets that lead to greater safety from hypoglycaemia, a reduction in unnecessary blood glucose monitoring, treating infections promptly to minimise pain and discomfort, providing pain relief, and at times considering withdrawal of treatment in type 2 diabetes when the individual is in the near stages of death and is not being troubled by hyperglycaemia.

Diabetes treatment considerations

This section is summarised by considering how each person with diabetes can actively seek optimal care and treatment by adopting what is termed a "successful ageing" approach. Along with glucose regulation, active management of other cardiovascular risk factors – especially hypertension and dyslipidaemia – is necessary from the outset. Advice on diet and lifestyle are given as for middle-aged people, including an exercise programme if possible. Including a resistance training component may be important in minimising the disability (by increasing muscle strength) associated with lower limb dysfunction.

Treatment strategies aimed at blood glucose lowering in older people are similar to those in younger people but treatment decisions are influenced by hypoglycaemia risk, presence of frailty, renal impairment, carer involvement and what glycaemic targets have been agreed.

Thiazolidinediones

Although pioglitazone is associated with a low risk of hypoglycaemia (Vlckova et al, 2010), weight gain can occur with a two-fold increased risk of heart failure (Chilcott et al, 2001), in which they are contraindicated. In the UK it can be given in combination with

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Box 6. Recommendations for improving diabetes management in care homes.

- Screen for diabetes on admission and regularly thereafter.
- Policies must include strategies to minimise hospital admission, metabolic decompensation, pressure sore development, pain, diabetes-related complications, infections and weight loss.
- All residents should have an individual diabetes care plan that is reviewed regularly and after any intermittent illness.
- All residents with diabetes should have an annual review and access to specialist services.
- All care homes should have a diabetes care policy that can be regularly updated and be a basis for diabetes audit.
- Staff should have the relevant knowledge and skills, and participate in regular diabetes continuing professional development programmes.

metformin, sulphonylureas, or both and be given with insulin (NICE, 2009b). Pioglitazone is associated with an increased fracture risk, mainly in women, and this is an additional factor to consider when screening older people with osteoporosis for treatment with this drug. It is relatively safe in mild to moderate renal impairment (Chilcott et al, 2001).

Incretin therapies

Incretin therapies for type 2 diabetes provide a new and what appears to be a relatively safe way of lowering blood glucose levels. There are two classes: dipeptidyl peptidase-4 (DPP-4) inhibitors – considered as an alternative to second-line sulphonylurea therapy in cases where hypoglycaemia is considered a major risk (NICE, 2009b); glucagon like peptide-1 (GLP-1) receptor agonists – considered as third-line therapy in those with obesity (defined as a BMI $\geq$35 kg/m^2 [NICE, 2009b; BMI $\geq$30 kg/m^2 [SIGN, 2010]). NICE (2009b) also states that incretin therapies may be used in a person with a BMI <30 kg/m^2 if insulin is not an acceptable treatment because of occupational implications, or the weight loss associated with these classes would benefit other comorbidities.

These are given subcutaneously and have advantages similar to DPP-4 inhibitors with important reductions in HbA$_{1c}$ levels and relatively good tolerability (Richter et al, 2008). Weight neutrality with DPP-4 inhibitors and weight reduction with GLP-1 receptor agonists, as well as the low risk of hypoglycaemia with both classes, are valuable in managing diabetes in older people (Richter et al, 2008).

Insulin

Insulin therapy in older people should not differ particularly from that used in younger people, but in frail individuals, complex regimens should be avoided and the use of longer-acting insulin analogues during the day often combined with oral agents is a feasible alternative.

Rapid-acting insulin analogues may cause less hypoglycaemia and weight gain, and can be given after eating where mealtimes may be unpredictable, for example because of memory disorder. In older people with type 2 diabetes, a twice-daily regimen of human isophane insulin can be used, adding short-acting insulin to cover meals if necessary. The newer long-acting insulin analogues (for example, insulin glargine and insulin detemir) have more reproducible pharmacokinetics and a "peakless" action profile, and may be better tolerated by older people.

Once-daily insulin regimens alone are rarely used now, except where glycaemic control is not a priority or injections are impracticable. Insulin can usefully be combined with an oral agent in people failing to be controlled by diet and oral agents. A suitable regimen is a night-time dose of intermediate acting insulin (for example, neutral protamine hagedorn [NPH] insulin) together with metformin, which causes less weight gain and hypoglycaemia, and better glycaemic control than twice-daily insulin or combinations of glibenclamide with insulin or metformin (Holman et al, 2009).

Hypoglycaemia

The presenting symptoms of hypoglycaemia in older adults can primarily be neuroglycopenic (confusion, delirium and dizziness) rather than adrenergic (palpitation, sweating and tremors). Hypoglycaemia in this context would be the presence of symptoms plus a plasma glucose level of $\leq$3.9 mmol/L. Healthcare professionals may misdiagnose hypoglycaemia as a stroke, transient ischaemic attack, unexplained confusion, or seizure.

People with cognitive impairment or loss of the warning symptoms of hypoglycaemia are at increased risk, as they may not recognise impending hypoglycaemia or fail to communicate their feelings to their carers. Multiple factors underlie the increased susceptibility to hypoglycaemia in older people, including recent discharge from hospital with altered sulphonylurea dosages, renal or hepatic impairment, excess alcohol and insulin therapy. In addition, older people mount a diminished counter-regulatory response to hypoglycaemia (Meneilly et al, 1994), and this may delay recovery.

Page points

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Although the risk of hypoglycaemia is highest with insulin, prolonged hypoglycaemia is an important clinical issue for older people taking certain antidiabetes drugs. Impaired renal function further prolongs hypoglycaemia secondary to sulphonylureas that are cleared through the kidneys. Shorter-acting sulphonylureas, such as gliclazide, glipizide and tolbutamide are less likely to cause hypoglycaemia but caution should always be exercised. Newer oral agents such as pioglitazone and the DPP-4 inhibitors as well as the injectable therapies, GLP-1 receptor agonists and the longer-acting insulin analogues, may decrease the risk of hypoglycaemia in this group.

In older people, serious hypoglycaemia appears to carry a worse prognosis and higher mortality; permanent neurological damage may occur, presumably because of already compromised cerebral circulation. Most sulphonylureas have caused severe hypoglycaemia, which in certain circumstances can be fatal. Other factors predisposing to fatal hypoglycaemia include alcohol consumption, poor food intake, weight loss, renal impairment and potentiation of hypoglycaemia by other drugs.

Recurrent hypoglycaemia may be a particular problem in care home residents with diabetes taking insulin or sulphonylurea therapy (Abdelhafiz and Sinclair, 2009). Residents appear to have many hypoglycaemia risk factors that increase their vulnerability to hypoglycaemia, which further impairs their wellbeing and may increase hospital admission rates. An approach to reducing this risk is given in the Diabetes UK (2010) guidance.

Many older people cannot treat hypoglycaemia themselves. An educational programme should focus on detecting and treating hypoglycaemia, with advice to others about how to manage cases of unresponsive hypoglycaemia. In view of the additional vulnerability of older people to hypoglycaemia, extra caution is required when there is a history of recurrent symptoms, drowsiness is present, the person is on relatively large doses of insulin, or when their diabetes care is delegated to an informal carer. This increased risk must be balanced by a lower threshold for admission to hospital when hypoglycaemia is suspected. In this setting, a glucose level <4 mmol/L may warrant admission.

Conclusion

Diabetes is a high-impact disorder that poses challenges of a highly complex nature for many health and social care professionals. This article describes key areas where change leading to enhanced care is feasible without major changes in healthcare policy being necessary.

All members of the diabetes care team must honour their commitment to strive for excellence in medical care, and diabetes in ageing people poses one of the more distinct of these challenges. Thoroughness, vigilance, compassion and professionalism are prime qualities in managing older people with diabetes. When this care can be integrated and meet the aims of agreed clinical care pathways, we help to lower inequality, reduce inequity of care, and enhance the likelihood of a better outcome. ■

Box 7. Case report.

Narrative

Mr M is an 80-year-old man living alone in a local authority housing block. He has a 7-year history of type 2 diabetes treated with metformin (850 mg twice-daily) and gliclazide (80 mg twice daily). Widowed 2 years ago, his wife previously managed his diabetes and organised his diet and tablets. He has no close family nearby and his only outside contact is home help. The home help tries to organise tablets but often finds that he has not taken them. He was admitted to hospital several times with hypoglycaemia. He has a poor appetite, is losing weight and has little interest in outside activities. His HbA_{1c} level is 9.6% (81 mmol/mol).

Discussion

Mr M needs a mood assessment by a physician or nurse trained in depression screening. In addition, he requires a full medical assessment to exclude other remedial causes of weight loss to exclude malignancy. If the assessment indicates the presence of a mood disorder, and no complicating factors are present, such as significant disturbance with marked aggression, or significant weight loss due to lack of appetite, the attending physician may decide to start a selective serotonin reuptake inhibitor. A social care assessment is warranted to establish whether some temporary placement in sheltered accommodation is required while he receives treatment. An assessment by the community diabetes team is recommended.

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"Thoroughness, vigilance, compassion and professionalism are prime qualities in managing older people with diabetes. When this care can be integrated and meet the aims of agreed clinical care pathways, we help to lower inequality, reduce inequity of care, and enhance the likelihood of a better outcome."

CPD module

CPD module

Online CPD activity

Visit www.diabetesandprimarycare.co.uk/cpd to record your answers and gain a certificate of participation

Participants should read the preceding article before answering the multiple choice questions below. There is ONE correct answer to each question. After submitting your answers online, you will be immediately notified of your score. A pass mark of 70% is required to obtain a certificate of successful participation; however, it is possible to take the test a maximum of three times. Before accessing your certificate, you will be given the opportunity to evaluate the activity and reflect on the module, stating how you will use what you have learned in practice.

1. **Which of the following statements applies to care home residents with diabetes? Select ONE option only.**
   A. Once-daily insulin regimens are now the preferred choice in managing older people with diabetes in care homes.
   B. The prevalence of diabetes in care homes is approaching 15%.
   C. In end-of-life care scenarios, withdrawal of insulin therapy in type 2 diabetes should be considered.
   D. Insulin treatment should be encouraged to promote weight gain in those with weight loss.
   E. Diabetes should be considered as a likely first cause of weight loss in residents in care homes.

2. **Which of the following statements is NOT true with regard to the management of older people with diabetes? Select ONE option only.**
   A. There is a high level of medical comorbidity.
   B. There is a enhanced ability to counter-regulate hypoglycaemia.
   C. There is an increased risk of inpatient mortality.
   D. There is an increased reliance on support from carers.
   E. There is an increased risk of cognitive dysfunction.

3. **Additional caution is required to minimise hypoglycaemia in older people when which of the following factors are present? Select ONE option only.**
   A. An estimated glomerular filtration rate above 60 mL/min/1.73m^2.
   B. Treatment with metformin.
   C. A history of dementia.
   D. Lack of previous history of hypoglycaemia.
   E. Treatment with a dipeptidyl peptidase-4 (DPP-4) inhibitor.

4. **Impaired cognitive function in an older person with diabetes can result in which of the following situations? Select ONE option only.**
   A. Improved adherence to treatment because care is delegated to others.
   B. Less hypoglycaemia because of missed treatments.
   C. Increased likelihood of specialist follow-up.
   D. Increased risk of care home residency.
   E. Reduced risk of undernutrition because meals are better supervised by care home staff.

5. **Which of the following does NOT increase the risk of hypoglycaemia in older people with diabetes? Select ONE option only.**
   A. Weight loss.
   B. Renal impairment.
   C. Hospital admission.
   D. Dementia.
   E. Excess alcohol.

6. **Which one of the following antidiabetes agents has been shown to increase the risk of fractures in older women? Select ONE option only.**
   A. Thiazolidinediones.
   B. DPP-4 inhibitors.
   C. Biguanides.
   D. Suphonylureas.
   E. Alpha-glucosidase inhibitors.

7. **Which of the following statements is NOT true in older people with type 2 diabetes? Select ONE option only.**
   A. Hyperinsulinaemia is a recognised cause of cognitive impairment.
   B. Cognitive impairment may be associated with impaired glucose tolerance.
   C. Cognitive impairment may lead to poor adherence to drug treatment.
   D. Cognitive impairment can be associated with increased incidence of hypoglycaemia.
   E. People with diabetes and cognitive impairment are less likely to be hospitalised.

8. **An 81-year-old man with a 15-year history of type 2 diabetes presents with a urinary tract infection and new onset confusion. He has a past history of an inferior myocardial infarction complicated by heart failure. His current medication is metformin 850 mg twice-daily and gliclazide 160 mg twice-daily. His HbA$_{1c}$ level is 10.4% (90 mmol/mol). He has normal renal function. Which of the following treatment options would be the best course of action? Select ONE option only.**
   A. Add pioglitazone.
   B. Add basal insulin.
   C. Start a twice-daily mixed insulin.
   D. Start short-acting insulin with the main meal.
   E. Start a DPP-4 inhibitor.

9. **Which of the following medications could treat a 75-year-old person with diabetes and a history of renal impairment whose current estimated glomerular filtration rate is 25 mL/min/1.73 m^2. Select ONE option only.**
   A. Pioglitazone.
   B. Metformin.
   C. Exenatide.
   D. Sitagliptin.
   E. Glimeperide.

10. **Frank is 67-year-old man who has had type 2 diabetes for 2 years. He attends his appointment with his daughter who lives with him. He has had learning difficulties for some time and his Mini-Mental State Examination score is 19/30. His HbA$_{1c}$ level is 9.6% (81 mmol/mol) and he is treated with three oral antidiabetes drugs. Which one of the following is NOT an appropriate intervention? Select ONE option only.**
    A. Arrange for his medication to be dispensed in a pill dispenser.
    B. Consider involvement of social services.
    C. Consider referral to a psychogeriatrician.
    D. Initiate a basal–bolus insulin regimen.
    E. Change his sulphonylurea to a short-acting agent.