

Type 2 diabetes in older people

The prevalence of type 2 diabetes is rising in the UK. The number of people with diabetes recorded on practice diabetes registers for the Quality and Outcomes framework (QoF) payments rose from 3.4% in 2004/5 to 3.9% in 2007/8.¹ Figures based on a model of prevalence suggest that in 2010 there were 3.1 million people with diabetes in the UK, aged 16 and over, a prevalence rate of 7.4% and that 27% had yet to be diagnosed.² Diabetes prevalence rises with age, so the majority of people with diagnosed diabetes in the UK are over 50 years of age.

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The diagnosis of diabetes has been based on glucose measurements. In someone with symptoms suggestive of diabetes, such as polyuria and polydipsia, one abnormal glucose measurement is sufficient for a diagnosis. The blood glucose level for diagnosing diabetes on a random plasma glucose or a post 75g glucose challenge is 11.1mmol/L and above. Diabetes is diagnosed on a fasting plasma glucose of 7mmol/L and above. An HBA1c level at or above 48 IFCC units (6.5%) has recently been recognised by the World Health Organization (WHO) as being diagnostic of diabetes.³ This addition of a raised HBA1c as a diagnostic criteria for diabetes is likely to be adopted in the UK soon.

Evidence based management and NICE guidance

A large number of trials have been conducted in type 2 diabetes that provide evidence to guide clinical treatment decisions, and a number of guidelines have been published. In 2008, NICE published its updated guideline on all aspects of the management of type 2 diabetes.⁴ This was republished with an updated section on glucose lowering agents in 2009.⁵

Glucose lowering agents

NICE guidance⁵ recommends that if an individualised glycaemic target is not achieved through lifestyle modification, metformin should be the first oral agent of choice. If full dose metformin alone does not achieve the glycaemic target, the guideline recommends that a sulphonylurea be added. However it recommends that if hypoglycaemia is of particular concern pioglitazone (Actos)

or a DPP4 inhibitor can be chosen instead. The guidance highlights the elderly living alone as one group that might be considered at significant hypoglycaemia risk.

If two oral agents (usually metformin plus a sulphonylurea) at full tolerated doses are insufficient to achieve glycaemic control the guideline recommends that either pioglitazone or a DPP4 agent can be added in "triple oral" therapy. If the person is significantly obese (usually BMI at or above 35) a GLP-1 agonist can be considered, or if the person has significant hyperglycaemia on two oral agents, insulin should be considered as the treatment of choice. Apart from the mention of the elderly in relation to sulphonylurea therapy, age is hardly mentioned in the NICE type 2 diabetes guidelines.

Metabolic target for glucose control

NICE recommends that this should be an HBA1c of 48 in IFCC units which is 6.5%, in people who are newly diagnosed with type 2 diabetes and are being managed on diet or one or two glucose lowering agents. When a person has lived with type 2 diabetes for a number of years and is on two oral agents, a third agent should not be introduced unless the HBA1c rises to 58 or above in IFCC units (which is 7.5%).

Blood pressure targets

For the blood pressure target, NICE recommends a level of 140/80mmHg or below or 130/80mmHg or below if there is any evidence of end organ damage.

Lipid targets and statin use

For primary prevention lipid targets, NICE recommends

Case study

Helen is 79 years old and has been widowed for three years. She lives in a flat in a sheltered complex. She has had type 2 diabetes for 12 years. She takes metformin 500mg tablets twice a day and gliclazide tablets 80mg twice a day as well as amlodipine 10mg daily and lisinopril 20mg daily for blood pressure, plus simvastatin 40mg daily for lipid control.

She has had two hip replacements but has poor mobility due to osteoarthritis, which is in most of her large joints. She doesn't want further surgery. She was seen for her annual diabetes check four weeks ago when her HbA1c was 48 in IFCC units (6.5%), blood pressure was 120/74mmHg and total cholesterol was 4.2mmol/L. No changes in her medications were made.

The warden dialed 999 because they found Helen confused, sweaty and unable to stand this morning. She was well yesterday when the warden popped in. When the paramedic attends they find that her finger prick blood glucose to be 2mmol/L, and her blood pressure to be 90/40mmHg. An ECG is normal.

She is able to take oral fluids and begins to feel much better after a sugary drink and four biscuits. Helen then remembers that she had not eaten since yesterday but had taken her morning tablets. She had also done clothes washing this morning.

The paramedic leaves a letter for Helen's GP saying that she has had made a recovery from sulphonylurea induced hypoglycaemia and requesting that her medication be reviewed. At review Helen is feeling better but a finger prick glucose is only 4.8mmol/L and BP is 100/50mmHg. Her GP decides to stop gliclazide therapy and amlodipine and reduce her lisinopril to 10mg daily.

that virtually all people with type 2 diabetes should be on simvastatin 40mg once daily and that those at very high risk (defined as those with a strong family history of cardiovascular disease and/or microalbuminuria) should have a target of total cholesterol of 4mmol/L or less and an LDL cholesterol of 2mmol/L or less. These targets should also be extended to anyone who has already had a cardiovascular event.

QoF and type 2 diabetes

The QoF framework of the 2004 GP contract is a "pay for performance" system that rewards GPs for achieving clinical indicators in a number of disease areas, including diabetes. The diabetes indicators that reflect metabolic targets from 1 April 2011 are:

- Number of people with diabetes with HbA1c at or below HbA1c 7.5% (58 in IFCC units), at or below 8% and at or below 9%
- Number of people with diabetes with a blood pressure at or below 140/80mmHg
- Number of people with total cholesterol at or below 5mmol/L

The QoF targets, although they are audit standards for payment purposes, are fairly similar to the NICE guideline recommendations.

Older people

The trials on which NICE metabolic recommendations are based were conducted in fairly fit, healthy middle aged people who had a significant number of years of life expectancy. There is very little evidence for appropriate metabolic targets in anyone over the age of 78 years and virtually no evidence in older people with any degree of frailty, mobility problems or cognitive impairment who were excluded from the major trials.

A study of community living older people with diabetes in Wales,⁶ found that two thirds had significant comorbidities, and/or mobility problems and/or cognitive impairment, which would have excluded them from the major trials. Based on this data there is no evidence base for benefit in trying to achieve the NICE/QoF targets in around two thirds of individuals over 75 years.

Risks of tight metabolic targets

Hypotension, hypoglycaemia and statin induced myalgia can all result in an increased risk of falls, hospitalisation and death. There is therefore always a balance to be achieved in an individual older person between the perceived benefits of seeking to achieve targets and the potential risks of doing so.



Pictured: Model of Insulin

Pragmatic metabolic targets for patients over 75 years

Given the risks and lack of evidence for benefit we need pragmatic targets:

- If the person who is 75 years or over is fairly fit and healthy discuss with them the aim of keeping to the NICE/QoF metabolic targets for glucose, blood pressure and lipids if these can be achieved without significant risk
- If the person is 75 years and over and has significant comorbidities, and/or mobility problems and/or cognitive impairment discuss with them modifying their metabolic targets and diabetes management to ensure that there is virtually no risk of them developing hypoglycaemia or hypotension or statin induced myalgia. They may need to be excluded from QoF.

These pragmatic suggestions are supported by a European expert consensus group.⁷ They state that for the frail older person (defined as dependent, having multisystem disease, in care home residency, and including individuals with dementia) where hypoglycaemia risk is high and symptom control and avoidance of metabolic decompensation is paramount the target HBA1c should

be between 58–69 in IFCC units (7.5% to 8.5%). They also say that for the frail older person (defined as above) where avoidance of heart failure and stroke may be of greater relative importance than microvascular disease an acceptable blood pressure is at or below 150/90mmHg.

Patients in care homes

Diabetes is a common condition in residents of care homes. In a project that screened for diabetes in a population of 227 nursing home residents a diabetes prevalence of 25% was found with a further 25% of those screened having impaired glucose metabolism.⁸

In UK studies of care home diabetes,^{9,10} it was found that health professional input was scant and fragmented and knowledge of diabetes amongst care staff was poor. In one of the studies 64% of residents, had no record of anyone being responsible for diabetes review and management in the preceding year.

These studies show that care home residents with diabetes appear to be a highly vulnerable and neglected group, characterised by a high prevalence of macrovascular complications, marked susceptibility to infections,

(especially of the skin and urinary tract), increased hospitalisation rates compared to ambulatory diabetic patients, and high levels of physical and cognitive disability.

People living in care homes are registered with a GP. Many GPs, however, only attend residents when called by the staff for a specific problem. Difficulties of transport and mobility often mean that residents cannot get to the GP's surgery or to a hospital out patient clinic, and so routine follow up and pro-active diabetes care can get neglected.

In view of these concerns Diabetes UK published updated guidelines for the care of people with diabetes living in care homes in 2010. The executive summary has just been published.¹¹ Some of its main recommendations include:

- The use of an individualised diabetes care plan for each resident
- The development of a policy of diabetes care within each care home
- The establishment of a policy of screening for diabetes at admission and at two yearly intervals
- The development and use of an audit tool to assess the quality and extent of diabetes care
- The appointment of at least one diabetes specialist nurse for older adults in each district whose responsibilities encompass care home residents with diabetes
- Opportunities for care home staff to attend diabetes education programmes in each district.

Patients in nursing homes

A recent study has highlighted the significant levels of disability and nursing need in people with diabetes resident in nursing homes in one city.¹² Therefore, the emphasis in this very disabled group with huge nursing needs, many of whom would be regarded as terminally ill, must be on the quality of any remaining life. It can therefore be argued that only interventions that preserve or improve quality of life should be continued, and that interventions designed to improve quantity of life where evidence has been extrapolated from younger fitter populations, could be discontinued.

However many of these residents are still being prescribed preventative medicines such as statins and antiplatelet therapies.¹³ Many were continuing on glucose lowering agents and blood pressure lowering agents in spite of low HBA1c levels and low levels of blood pressure. The paper concludes by recommending that regular medication review of nursing home residents with diabetes should be undertaken, as it has the potential to reduce costs, minimise adverse drug reactions, and increase health gain.

Conclusion

The prevalence of type 2 diabetes is rising and the majority of people are over 50 years. There are evidence based guidelines from NICE to guide management but guideline recommendations are derived from studies performed in fit healthy middle aged people. The targets for blood pressure, glycaemia and lipids will need to be modified in the frail elderly. Care home residents with diabetes need appropriate pro-active care and nursing home residents with diabetes may need reductions in therapy, or therapy stopping, to maintain quality of remaining life.

Conflict of interest: Dr Roger Gadsby has received funding over the past 25 years for attending symposia and other educational events, for speaking at meetings, and for participating in advisory committees, from a variety of diabetes and cardiovascular pharmaceutical companies. These include AstraZeneca, GlaxoSmithKline, Servier, Sanofi-Aventis, Takeda, Bristol Myers Squibb, NovoNordisk, Roche, Roche Diagnostics, MSD, Merck-Serono, Grunenthal, Solvay and Novartis. He holds no shares in any companies. He was medical advisor to Warwick Diabetes Care (WDC), an organisation at Warwick University providing diabetes education programmes across the UK. WDC received support from 14 diabetes pharmaceutical companies who as foundation sponsors provided educational grants to assist its launch and initial development. Several of the current diabetes education programmes at Warwick Medical School are supported by educational grants from pharmaceutical companies who were foundation sponsors. His research on people with diabetes, resident in Nursing homes in Coventry from 2009–2011 was supported by unrestricted educational grants from NovoNordisk and Takeda. He is chairman of the Trustees of a small charity called Pregnancy Sickness Support Trust (Registered Charity No 1094788) which gives information and support to women with pregnancy sickness symptoms. The charity has received support from a number of organizations and companies including Vitabiotics Ltd, Duchesnay Inc (Canada) and the charity committee of Land Rover plc.

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