

DECISIONS

Diabetes in an older woman living in a long-term care residence

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An 80-year-old woman is seen for a periodic health examination by her family physician. Laboratory test results in her chart show a fasting blood glucose level of 11 mmol/L and a hemoglobin A_{1c} concentration of 9.5%. She has a body mass index of 28. She was diagnosed with type 2 diabetes 10 years earlier, but no formal treatment was started. She has been living in a long-term care residence for the last five years. The decision to move there was made because the patient did not feel secure living at home after an incidental fall. She is dependent for all of her instrumental activities of daily living (e.g., cooking and cleaning) and bathing, and she needs assistance with dressing. Her family has noted progressive cognitive problems over the last two years. The patient gets easily fatigued, walks slowly with a cane and has a low level of physical activity. She has been described as a “frail older person.”

How does the patient's frailty affect targets for glycemic control?

Frailty is a widely used term for a multidimensional syndrome that gives rise to increased vulnerability.¹ Frail older patients with diabetes have a median life expectancy of 23 months.² Therefore, it is unlikely that these patients will live long enough to obtain the benefits of tight glycaemic control. In addition, attempts at tight glucose control in these patients may be associated with hypoglycemia. Blood glucose levels in this group should be controlled well enough to prevent the effects of uncontrolled hyperglycemia, such as polyuria, infections and confusion. Recent guidelines from the Canadian Diabetes Association and other groups recommend that the target in this population should be a fasting or preprandial blood glucose level of 6–11 mmol/L and a hemoglobin A_{1c} concentration of 7.6%–8.5%.^{3,4} These guidelines are based on consensus among clinicians, and further studies are needed in this patient population to determine appropriate goals. In this patient's case, it might be reasonable to

aim for a fasting blood glucose level of 6–9 mmol/L, a premeal blood glucose level of less than 12 mmol/L and a hemoglobin A_{1c} concentration of 7.6%–8.5%.

Cognitive problems may have an effect on some aspects of diabetes management, such as learning how to measure blood glucose, how to recognize hypoglycemia and how to manage treatment with insulin (if required.) There is growing evidence of an association between type 2 diabetes in older patients and the risk of dementia (vascular and Alzheimer type).⁵ A longer duration of diabetes is associated with poorer cognitive performance.⁵ The exact mechanism underlying the association between these two entities is a matter of debate, but vascular lesions and repeated hypoglycemia may be contributing factors. Genetic factors, such as the presence of *APOE4*, may also be involved.⁵ The clock-drawing test is a good screening tool for cognitive problems that may affect therapy in patients with diabetes.³ Because this patient is in a long-term care residence, concerns regarding self-management of diabetes are minimized.

Is the patient a candidate for a nonpharmacologic approach?

Nutritional education programs can improve metabolic control in ambulatory older people with diabetes.³ Dietitians and physicians should

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KEY POINTS

- Diabetes in older people is metabolically distinct from diabetes in younger people, and the approach to therapy should be different.
- Insulin secretagogues (e.g., sulfonylureas) should be used selectively because the risk of hypoglycemia increases exponentially with age.
- If cognitive impairment or long-lasting disease is present, clinicians should address the patient's ability to recognize symptoms of hypoglycemia and adapt the treatment accordingly.
- Long-acting basal insulin analogues are associated with a lower frequency of hypoglycemia than conventional insulin in this age group.
- Choice and dosage of antidiabetic medication should, in most cases, take into account the estimated kidney function.

be cautious about recommending weight loss when frailty is present in patients with type 2 diabetes. A “healthy eating” attitude is more appropriate in many situations. For patients who live in long-term care residences, there is no evidence that “diabetic” diets improve control.³ For this patient, nutritional intake should meet the daily energy and protein requirements, and malnutrition should be avoided. The intervention of a dietician may be desirable.

Physical training programs can be successfully implemented for older people with diabetes, although comorbid conditions may prevent aerobic training.³ Exercise programs may reduce the risk of falls and improve balance,³ but it appears to be difficult to maintain these lifestyle changes outside of a supervised setting. For this frail patient, regular walking sessions within the residence should be encouraged.

What pharmacologic agents could be considered?

Initial therapy for obese older patients should involve agents that improve insulin resistance, such as metformin.³ In lean older patients, agents that stimulate insulin secretion may be preferable because the underlying problem is inadequate insulin secretion.³ However, sulfonylureas (insulin secretagogues) should be used with caution because of the risk of severe hypoglycemia. Gliclazide and glimeperide are preferred over glyburide.⁶ Meglitinides (non-sulfonylurea insulin secretagogues, e.g., repaglinide and nateglinide) are associated with a lower frequency of hypoglycemia in older patients compared with glyburide and are preferable for people with irregular eating habits.⁷

Several newer therapies have been evaluated in older patients, although no outcome data are available.³ Glitazones may be contraindicated in older patients because of an increased incidence of fractures, fluid retention and bladder cancer, and an uncertain impact on cardiovascular outcomes.

Drugs acting on the effects of incretin hormones, such as dipeptidyl peptidase IV inhibitors, are at least as effective in older patients and, when used as monotherapy, are associated with a much lower frequency of hypoglycemia than insulin secretagogues.⁸ There are limited data on glucagon-like peptide analogues, such as exenatide and liraglutide. For most of the drugs administered orally to treat diabetes, adjustments to dosing should be made according to the patient’s estimated glomerular filtration rate (eGFR).⁹

Insulin analogues glargine and detemir are associated with a lower frequency of hypoglycemia in older patients than NPH or premixed

human insulin.³ To date, there is no information on the use of glucose absorption inhibitors in older patients.

Is recognition of hypoglycemia a concern in this older patient?

The risk of severe or fatal hypoglycemia in response to agents administered orally or insulin increases exponentially with age.³ Hypoglycemia is associated with falls, fractures, cardiovascular events and a variety of other adverse events. It is one of the most common reasons for emergency admission to hospital for adverse drug events in older patients.⁶ Continuous glucose monitoring has shown that asymptomatic hypoglycemia is common and often prolonged in these patients.³ Hypoglycemia is more likely to develop in patients with dementia and, conversely, severe hypoglycemia later in life can predispose people to dementia.³ The increased risk of hypoglycemia with increasing age is due to reduced awareness of autonomic warning symptoms, impaired glucagon secretion (the most important counterregulatory hormone) and altered psychomotor performance during hypoglycemia that prevents the patient from taking steps to return the blood glucose level to normal.¹⁰ As noted above, selected oral agents and insulin preparations are associated with a lower frequency of hypoglycemia than other pharmacologic treatments in older patients.

Case revisited

The patient had an eGFR of 40 mL/min per 1.73 m². She was given metformin (500 mg orally twice daily) and will stay on this dose. More frequent blood glucose testing was ordered for three weeks, and she will be re-evaluated in one month. After one month, depending on the level of glycemia, there is an option to start a low dose of add low-dose treatment with gliclazide (preferred to glyburide because the patient’s eGFR is less than 50 mL/min per 1.73 m² and there is a lower risk of hypoglycemia with gliclazide) or a dose of dipeptidyl peptidase IV inhibitor adjusted for the GFR. A single daily dose of basal insulin will be a future option depending on the effects of the oral treatment. With the addition of new agents, it is reasonable to increase the frequency of blood glucose testing for a period of time (e.g., daily or twice daily for 7–10 d) and to decrease the frequency when the blood glucose levels are stable.

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