



Learning Outcomes

- Review and rationalise glucose lowering therapy to promote medication adherence
- Consideration of medical comorbidities, which may affect agent of choice
- Individualising glycaemic treatment targets depending on patient wishes, comorbidities and hypoglycaemia risk

VISIT ONE

Roy is a 74-year old male, diagnosed with type 2 diabetes ten years ago. He has been prescribed his current treatment for several years, however, his HbA1c has remained well over target for the last three years. His past medical history includes gastroesophageal reflux, myocardial infarction and congestive cardiac failure. He is a widower and lives alone. His meals tend to be erratic as he often sleeps late and misses breakfast. Roy states that he takes his medications erratically but is taking the insulin every day as prescribed. He confides that he worries about increasing the doses of insulin as he has had episodes of symptomatic hypoglycaemia. A pill organiser and a multidose blister pack have been trialed without success.

Current medications

Metformin 500mg twice daily
Gliclazide MR 60mg daily
Mixtard® 30/70 (Insulin isophane human 70 units/ml + Insulin neutral human 30 units/ml injection), 20 units twice daily
Aspirin 100mg daily
Amlodipine 10mg daily
Frusemide 40mg mane
Prazosin 0.5mg twice daily

Atorvastatin 40mg daily
Carvedilol 6.25mg twice daily
Esomeprazole 20mg daily

Temazepam 10mg nocte
Valsartan 160mg daily

Allergies

Seafood

Examination

Blood pressure 165/90 mmHg (no medications taken)
Weight 87 kg, Height 175 cm, BMI 31 kg/m²
Chest clear, heart sounds normal, mild swelling of ankles, pedal pulses present.

Investigations

HbA1c 77 mmol/mol (9.2%)
Urine albumin/ creatinine ration (ACR) 23.5 mg/mmol eGFR 70 ml/min/1.73m²
Total cholesterol 5.5 mmol/L, HDL 0.9mmol/L, LDL 3.5 mmol/L, TG 3.2 mmol/L.
Transthoracic echocardiogram: ejection fraction 45%, nil valvular abnormality

What are the management issues for this patient?

- Individualisation of glycaemic treatment targets according to patient wishes, comorbidities and hypoglycaemia risk.
- Optimisation of CV risk factors in view of established atherosclerotic CV disease.
- Appropriate choice of glucose lowering therapy to minimize CV risk, CCF hospitalisation and slow progression of CKD.

What is your management plan?

1. Patient's age and medical co-morbidities suggest that an HbA1c target of 58-64 mol/mol (7.5-8%) is appropriate.
2. There is a strong indication for a SGLT2i and either dapagliflozin or empagliflozin should be started unless there is a definite contra-indication. Consider DKA risk – some patients may be asked to ketone monitor but Roy would not be able to cope with this. Provide written instructions about when to suspend treatment to Roy and his carers. If a SGLT2i cannot be used or tolerated a GLP1 agonist is the next best choice.
3. Change metformin to the extended release formulation, which allows once daily dosing and increase dose to 2 gm.
4. Given Roy's erratic eating habits and to minimize the risk of hypoglycemia, the gliclazide is ceased and his insulin regimen is simplified to 30 units glargine daily.
5. Cease amlodipine as may be contributing to oedema and SGLT2i will have a comparable anti-hypertensive effect. Continue valsartan, frusemide, prazosin, aspirin and carvedilol.
6. Increase atorvastatin to "high dose" - initially 40 mg daily.
7. Arrange home visit and review by pharmacist for home review of all medications and insulin use.
8. Diabetes educator review of home blood glucose monitoring and insulin use.
9. Dietician review.
10. Arrange an Aged Care Assessment Team (ACAT) review to exclude depression or cognitive impairment.
11. Consider additional support and meals on wheels.

VISIT TWO

Roy presents for review two weeks after changing to the basal insulin regimen and starting empagliflozin 10 mg daily. He states that he has not experienced any hypoglycaemia or any other side-effects and is much happier that he does not need to wake up early to take insulin. He states he is better with taking his medications. His BGLs are better (7.0-11.5 mmol/L).

Current medications

Metformin XR 1gm with dinner
Glargine 30 units nocte
Aspirin 100mg daily
Atorvastatin 40mg daily

Carvedilol 6.25mg twice daily
Frusemide 40mg mane
Esomeprazole 20mg daily
Prazosin 0.5mg twice daily
Valsartan 160mg daily
Empagliflozin 10 mg daily

Examination

Blood pressure 120/85 mmHg
No oedema or signs of overt CCF
Weight 87 kg, Height 175 cm, BMI 31 kg/m²

What are the management issues for this patient?

- Individualisation of glycaemic treatment targets depending on patient wishes, comorbidities and hypoglycaemia risk
- Rationalisation of non-glycaemic therapies may be possible after successful introduction of SGLT2i therapy

What is your management plan?

1. Review medication adherence and titrate insulin and metformin doses.
2. Consider ceasing prazosin and reducing or ceasing frusemide Review medication adherence.
3. A combined metformin/empagliflozin preparation could be used to further reduce tablet load once individual doses are stabilised.

VISIT THREE

Roy returns in three months for review. Following review by the home pharmacist, all excess and unused medications at Roy's house were safely disposed. Medications were further rationalised and weaned under the guidance of Roy's GP. Roy is now more comfortable with his prescribed medications and states that he is taking them on almost all days. He has had no hypoglycaemia and presents his BGL record to allow titration of insulin doses.

Current medications

Metformin XR 100 mg
Empagliflozin 10 mg with dinner
Glargine 26 units at bed time
Atorvastatin 40mg daily

Aspirin 100mg daily
Carvedilol 6.25mg twice daily
Valsartan 160mg daily
Esomeprazole 20mg daily

Examination

Blood pressure 138/75 mmHg
Weight 78 kg, Height 175 cm, BMI 25 kg/m²

Investigations

HbA1c 60 mmol/mol (7.6%)
TC 3.5 mmol/L TG 1.2 mmol/L HDL 1.0 mmol/L LDL 1.7 mmol/L
eGFR 70 ml/min/1.73m²

What are the management issues for this patient?

- Safe use of medicines
- Renal function has stabilised and lipid profile optimised

What is your management plan?

1. Ongoing support and surveillance of medication use.
2. Monitor renal and liver function.
3. Monitor HbA1c and blood pressure at three monthly intervals, foot examination, urine ACR and lipid profile annually, biannual eye review.
4. Reiterate advice regarding temporary suspension of SGLT2i therapy during prolonged fasting or significant acute illness.

Pharmacy Home Medication Review

A pharmacist conducts a home visit to comprehensively assess all aspects of a client's medication management. This includes assessing the patient's ability to manage their medications and medication aids. Education about medicines and health conditions is also provided. Recent inpatient admissions as well as outpatient appointments are reviewed to enable the pharmacist to explain medication changes, possible omissions, and potential ways to optimise the patient's medication regimen.

Metformin and Lactic acidosis

Metformin does not worsen renal function. However, in patients with renal impairment, metformin is associated with an increased risk of lactic acidosis particularly in situations where lactate production is also increased. The incidence of metformin-associated lactic acidosis is 0.03 per 1000 patient years, but mortality may be as high as 50%.

Consider withholding metformin in the following situations:

- Significant renal insufficiency, including both intrinsic renal disease and renal hypoperfusion
- Significant hepatic impairment
- During episodes of severe intercurrent illness cardiovascular collapse (shock) from whatever cause, acute congestive heart failure, acute myocardial infarction and other conditions characterized by hypoxemia
- 48 hours subsequent to the procedures requiring iodinated contrast
- Any surgical procedure (except minor procedures not associated with restricted intake of food and fluids) and restarted when the patient's oral intake has resumed and providing that the serum creatinine level has not risen significantly

Australian absolute cardiovascular disease risk calculator

Enter patient information below:

Sex Male Female
Age 74 years
Systolic blood pressure 165 mmHg
Smoking status Yes No
Total cholesterol 5.5 mmol/L
HDL cholesterol 1.0 mmol/L
Diabetes Yes No
ECG LVH Yes No Unknown

You are at increased risk of developing cardiovascular disease in the next 5 years. A score is not provided because your risk factors show increased risk not needing numerical calculation of absolute risk. If you would like further information, please refer to the 2018 absolute cardiovascular risk assessment guidelines or see your doctor.

Please note: the absolute risk calculator score is only a guide to your heart and stroke risk score. Print out this page and take it to your doctor for further information on your personal risk.

View guidelines and resources

Diabetes Australia
KIDNEY HEALTH AUSTRALIA
Heart Foundation
strokefoundation

Additional resources

<https://www.nps.org.au/consumers/managing-your-medicines>