Meet Deepa

Learning Objectives

- Explore the factors influencing the choice of first line glucose lowering therapy for type 2 diabetes
- Determine when to escalate to second line glucose lowering therapy
- Identify strategies to promote medication adherence
- Examine for and exclude secondary causes of diabetes
- Develop a systematic approach to assess, manage and monitor risk of micro- and macrovascular complications of diabetes
- Outline the role of lifestyle as a complement to pharmacotherapy for those recently diagnosed with type 2 diabetes

VISIT ONE

Deepa is a 49-year old accountant. She developed gestational diabetes during her second pregnancy 12 years ago. The gestational diabetes was treated with insulin and post-partum oral glucose tolerance testing was normal. Since then, Deepa has had a screening fasting blood glucose test every two years. Deepa was born in India and migrated to Australia aged five. She lives with her husband and two children aged 14 and 12 years. Deepa works part-time as an accountant. She performs no regular exercise, apart from a weekly, half-hour walk at lunch time with a colleague. She does not drink alcohol and has never smoked. Family history is significant for type 2 diabetes affecting her mother and maternal grandmother. She was noted to be hypertensive two years ago and commenced on treatment. She does not report polyuria, polydipsia, weight loss, infection, blurred vision or lethargy. Recent screening of venous glucose and confirmatory HbA1c testing has established the diagnosis of diabetes, which has been classified clinically as type 2.

Current medications

Candesartan 16mg daily Multivitamin
Levonorgestral intrauterine contraceptive device

Allergies

Penicillin

Examination

Blood pressure 130/80 mmHg
Random capillary glucose 8 mmol/L
Weight 70 kg, Height 160 cm, BMI 27kg/m^2
Pedal pulses present and monofilament sensation intact
Central adiposity and acanthosis nigricans, nil striae, thin skin, rounded facies or central weakness

Investigations

HbA1c 55 mmol/mol (7.2%) (on two separate occasions)
eGFR >90 ml/min/1.73m^2. Liver function tests, no abnormality detected

What are the management issues for this patient?

- Consider the possibility of secondary causes of diabetes and exclude if clinically indicated
- Provision of lifestyle advice for the management of type 2 diabetes
- Commencement of first line glucose lowering therapy
- Screening for the development of microvascular complications at diagnosis of type 2 diabetes
  - > Fundal examination through dilated pupils for evidence of retinopathy or retinal photography for evidence of retinopathology
  - > Urine albumin/creatinine ratio (ACR), a spot sample is adequate to quantify the albumin excretion rate for evidence of nephropathy
- Evidence of macrovascular complications should be sought through detailed history and examination
- Assessment of cardiovascular risk and consideration of preventive measures

What is your management plan?

1. Patient's age and lack of medical co-morbidities suggest that an HbA1c target of 48 mmol/mol (6.5%) would be appropriate.
2. Advise Deepa regarding lifestyle modification including diet (appropriate food choices, portion sizes and other strategies to lose weight) and physical activity.
3. Refer to dietician and diabetes educator.
4. Arrange complication screening investigations – urine ACR, lipid profile, fundal examination.
5. Commence metformin (generally start with extended release) 500mg nocte and gradually titrate to 2g daily as tolerated.

Australian Diabetes Society is a National Health Professional Body Agent for the NDSS.

NDSS Helpline 1800 637 700
ndss.com.au

The NDSS is administered by Diabetes Australia

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VISIT TWO

Deepa returns in two weeks for the results of the investigations requested at the last review. Having seen a dietician, she has made considerable changes to her diet to incorporate regular meals and improved food choices. She has commenced a regular exercise program of aerobic and strength training. Deepa states that she has been taking the metformin most days despite being troubled by mild nausea.
A letter from the optometrist indicates no evidence of diabetic retinopathy. Urine albumin creatinine ratio was within normal limits as was renal function with an estimated glomerular filtration rate (eGFR) >90 ml/min/1.73m^2.

Current medications

Metformin XR 2gm nocte with or after the evening meal
Candesartan 16mg daily

Investigations

Urine ACR <2.5 mg/mmol
eGFR >90 ml/min/1.73m^2
Total Cholesterol 4.0 mmol/L, HDL 1.0 mmol/L, LDL 2.5 mmol/L, TG 1.1 mmol/L

Deepa's cardiovascular risk is estimated using the Australian absolute cardiovascular risk calculator to be 5% in the next five years.

What are the management issues for this patient?

- Assessment of cardiovascular risk and consideration of preventive measures
- Medication use and side effects

What is your management plan?

1. Given Deepa has a low risk of cardiovascular events in the next five years, she does not require antiplatelet or lipid lowering therapy for primary prevention. However, risk should be re-assessed every year.

VISIT THREE

Three months later, Deepa presents for follow up. She has had significant weight loss (6kg). She is now taking all of her medications as prescribed, she uses an alarm on her phone to assist with this.

Current medications

Metformin XR 2g daily (dinner) Candesartan 16mg daily

Examination

Blood pressure 120/80 mmHg
Random capillary glucose 5.5 mmol/L
Weight 64 kg (-6kg), Height 160 cm, BMI 25 kg/m^2

Investigations

HbA1c of 46 mmol/mol (6.4%)

What are the management issues for this patient?

- Maintenance of lifestyle changes, medication use and monitoring for side effects

What is your management plan?

1. An HbA1c of 53 mmol/mol (7%) is appropriate for most patients. However, given Deepa is young and recently diagnosed it is reasonable to aim for an HbA1c of ≥ 48 mmol/mol (6.5%).
2. Deepa has had a good response to metformin XR and lifestyle modification. It is reasonable to continue current therapy. If a rise in HbA1c occurs early escalation to second line therapy will be necessary.
3. Monitor HbA1c and blood pressure at three-six monthly intervals, foot examination, urine ACR and lipid profile annually, biannual eye review.

Diagnosing diabetes in asymptomatic patients

- FBG ≥7.0 mmol/L *
- 2 hour postprandial ≥11.0 mmol/L on OGTT
- HbA_{1c} of 48 mmol/mol (≥6.5%)*

*In the absence of symptoms or unequivocal hyperglycaemia, results should be confirmed by repeat testing

Diagnosing diabetes in asymptomatic patients

- Ketones (which may be absent)
  Polyuria, polydipsia
- Weight loss or BMI <25 kg/m^2
- Young age
- Family history of autoimmune disease
- Rapid onset of symptoms

People considered to be at high risk of type 2 diabetes

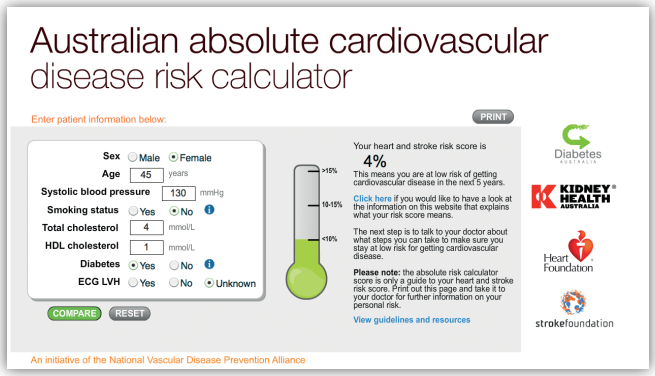
- People with IGT or IFG
- All patients with a history of a cardiovascular event (acute myocardial infarction, angina, peripheral vascular disease or stroke)
- People aged 35 years and over originating from the Pacific Islands, Indian subcontinent or China
- People aged 40 years and over with body mass index (BMI) ≥30 kg/m^2 or hypertension
- Women with a history of Gestational Diabetes Mellitus (GDM) Women with polycystic ovary syndrome (PCOS) who are obese Patients on antipsychotic medication
- Strong family history of type 2 diabetes

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



Additional resources

https://www.cvdcheck.org.au/