Management of Diabetes in LMIC: Case Studies

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Learning objectives

- Set goals for treatment targets based on patient profiles and co-morbidities
- Optimize use of therapeutic agents with respect to individual patient characteristics/profiles
- Better select most appropriate agent(s) with respect to presence of co-morbidities
- Optimize use of injectables alone or in combination
- Discuss potential adverse effects of therapeutic agents

Case 1 - Mr N

- Mr 'N', aged 42, does not exercise regularly
- He has gained 5 kg in 18 months
- Mr 'N' has noticed he is having difficulty reading the newspaper and sometimes his vision is blurred
- Denies polyuria or polydipsia
- Nonsmoker
- Does not drink alcohol

Current status

- 42 years old
- Weight: 93 kg
- Height: 176 cm
- BMI: 30 kg/m^2
- Waist circumference: 98 cm

Mr N : history and examination

Medical history

- No history of major illness
- Not currently on any medication
- Father had type 2 diabetes, died 2 years ago after myocardial infarction

Clinical chemistry

FPG:	11 mmol/l (198 mg/dl)
HbA_{1c}:	10.0%
Urine ketones:	Negative
LDL cholesterol:	126 mg/dl (3.23 mmol/L)
HDL cholesterol:	35 mg/dl (0.90 mmol/L)
Triglycerides:	275 mg/dl (3.10 mmol/L)
ALT:	45 U/l*
AST:	50 U/l*
Blood pressure:	124/82 mmHg
Creatinine:	0.8 mg/dl (70.72 umol/L)
eGFR:	115 ml/min

*Normal values: ALT, <40 U/l; AST, <40 U/l

What does Mr N's history tell us?

- Are there any additional questions you would want to ask?
- Ideally, what additional tests should you ask for?
- What factors would you take into consideration when choosing medications?

What should the approach be for Mr N?

What would be the target levels for HbA1c?

a. ≤6.5%
b. 6.5-7.0%
c. 7.0-7.5%
d. < 8.0%

What should the approach be for Mr ‘N’?

- What counseling would you suggest regarding lifestyle modification?
- Do you “prescribe” particular diets or make recommendations based on the history you obtain?
- Do you write prescriptions for exercise for your patients?

What should the approach be for Mr N?

What would be the most appropriate choice for initial pharmacotherapy?

a. Insulin
b. Metformin
c. Sulphonylurea (SU)
d. Other

Mr N returns to the clinic 3 months later

Mr N's fasting glucose levels remain high at 8.3 mmol/l (150 mg/dL)- what is your next step in management?

a. Add DPP-4 inhibitor
b. Add SU
c. Add insulin
d. Add SGLT-2 inhibitor
e. Add GLP-1 RA

Further treatment intensification

- If treatment goals are still not met with 2 medications, what additional medication would you recommend?
- In periods of fasting, such as Ramadan, how would you amend the treatment regimen to minimize risk of hypoglycemia?

Case 2 - Mrs A

- 59-year-old schoolteacher, keeps fit by walking and cycling
- Weight usually stable
- Presents with a 6-month history of lethargy and thirst, unexplained weight loss in last 6 months
- Has noticed increased frequency of urination during the day and night

Initial presentation

- Weight: 50.2 kg
- Height: 152 cm
- BMI: 21.7 kg/m^2

Medical history

- No major illnesses
- No medications
- Father died following stroke aged 71
- Mother alive and well

Lean adult: first presentation and early therapy

Blood pressure

Systolic/diastolic: 138/90 mmHg

Clinical chemistry

FPG: 14 mmol/l (252 mg/dl)

HbA_{1c}: 9.2%

LDL-cholesterol: 80 mg/dl (2.1 mmol/L)

HDL-cholesterol: 42 mg/dl (1.1 mmol/L)

Triglycerides: 135 mg/dl (1.5 mmol/L)

Normal renal and liver function tests

What does Mrs As history tell us?

Open discussion

- Are there any additional questions you would want to ask?
- Ideally, what additional tests should you ask for?
- Does she have Type 1 or Type 2 diabetes?
- What factors would you take into consideration when choosing medications?

What should the approach be for Mrs ‘A’?

What would be the target levels for HbA1c?

a. ≤6.5%
b. 6.5-7.0%
c. 7.0-7.5%
d. < 8.0%

What should the approach be for Mrs A?

What would be the best choice for initial pharmacological treatment?

a. Metformin monotherapy
b. SU monotherapy
c. Basal insulin
d. Basal-bolus insulin
e. Pre-mixed insulin
f. Other

Case 3 - Mrs L

- 76 years old – T2DM for 3 years
- Treated initially with metformin, titrated up to 2000 mg daily
- Glucose well controlled for 9 months
- Gliclazide 160 mg was added after her HbA1c levels began to exceed 7.5%, and then dose increased to 320 mg daily.
- She has recently felt unwell, with intermittent episodes of 'dizzy spells' associated with increased hunger – these usually occur in the mid to late afternoon
- She is also taking 10 mg atorvastatin daily

Clinical chemistry

FPG:	8.8 mmol/l (160 mg/dl)
HbA_{1c}:	7.8%
LDL-cholesterol:	81 mg/dl (2.1 mmol/L)
HDL-cholesterol:	43 mg/dl (1.1 mmol/L)
Triglycerides:	124 mg/dl (1.4 mmol/L)
eGFR:	74 mL/mim/1.73 m^2

Blood pressure

Height	160 cm
Weight	70.4 kg
BMI:	27.5 kg/m^2
BP	145/84 mmHg

What does Mrs ‘L’s history tell us?

- Are there any additional questions you would want to ask?
- What factors would you take into consideration when choosing medications?

What should the approach be for Mrs 'L'?

What would be the target levels for HbA1c?

a. ≤6.5%
b. 6.5-7.0%
c. 7.0-7.5%
d. 7.5-8.0%

What should the approach be for Mrs ‘L’?

What would be the target levels for BP?

a. <120/80 mmHg
b. <130/80 mmHg
c. <140/85 mmHg
d. <140/90 mmHg
e. <150/90 mmHg

What should the approach be for Mrs 'L'?

What would be the target levels for LDL?

a. 30 mg/dl (0.8 mmol/L)
b. 30-50 mg/dl (0.8-1.3 mmol/L)
c. 50-70 mg/dl (1.3-1.8 mmol/L)
d. 70-101 mg/dl (1.8-2.6 mmol/L

Discussion question for Mrs L?

Would you change her medication? If so, how?

a. Stop glimepiride, add DPP-4 inhibitor and possibly basal insulin if goals not met
b. Add basal insulin
c. Stop glimepiride, add GLP-1 RA and basal insulin
d. No change in medication
e. Stop current medications and start pre-mixed insulin

Case 4 – Mr. A

- 51-year-old man, diagnosed with T2DM 11 years ago
- He works long hours in a factory making electronic parts
- Mr A admits his diet is very poor and often he will go for long periods without any food
- His HbA1c has stabilized between 6.5% and 7.5%

Current therapy

- Metformin 2000 mg daily
- Glimepiride 4 mg daily
- Basal insulin 20 U/day

Mr A explains why he's come to the clinic

- He says that during the day at work he feels very tired and has to rest
- Occasionally he begins to feel dizzy
- This type of incident also happens sometimes in the morning when he is getting ready for work
- He tries to maintain weight and tries to exercise 3-4 times per week

Assessment

FPG:	5.5 mmol/l (100 mg/dl)
HbA_{1c}:	6.6%
BP:	145/92 mmHg
Weight:	79 kg
Height:	173 cm
BMI:	26.4 kg/m^2

What does Mr ‘A’s history tell us?

- Are there any additional questions you would want to ask?
- What factors would you take into consideration when choosing medications?

What should the approach be for Mr ‘A’?

What would be the target levels for HbA1c?

a. ≤6.5%
b. 6.5-7.0%
c. 7.0-7.5%
d. < 8.0%

What should the approach be for Mr 'A'?

His HbA1c is 6.6% – how would you adjust treatment to prevent these episodes of hypoglycemia?

a. Discontinue SU, maintain insulin
b. Discontinue SU, switch to DPP-4 inhibitor, maintain insulin
c. Decrease SU and insulin doses
d. Discontinue SU, decrease insulin dose and add GLP-1 RA
e. Discontinue SU, add SGLT-2 inhibitor

In addition to changes in glucose-lowering approach...

What other steps would you advise for Mr 'A'?

a. Redouble efforts with respect to a healthy diet
b. Add an ACE inhibitor to improve BP control
c. Remind how to treat/manage hypoglycaemia
d. Check BG levels before driving
e. All of the above