Clinical Cases- Diabetes

Quizzes

(Questions and Answers)

Clinical Cases Diabetes Quizzes

Case 1.

A 78 year old male presents to endocrine clinic for diabetes evaluation after recent hospital stay for a heart failure exacerbation. His past medical history is significant for ESRD on hemodialysis, HFrEF with an EF of 35%, CAD s/p multiple stents, COPD on home O2, hypertension, and hyperlipidemia.

His diabetes medication regimen is presently lantus 20 units qHS, lispro 7 units TID AC, and glipizide XL 10mg qday.

His wife is concerned about several low blood sugar readings since discharge from the hospital. He has had numerous blood sugar readings in the 50-60s mg/dL in the morning along with before meals during the day. He has classic hypoglycemic symptoms during these episodes.

Physical exam is significant for the following: BMI 28kg/M2 , BP 117/68mmHg, Heart rate 82bpm along with +2 pitting edema in the lower extremities bilaterally.

His most recent labs from 1 month ago were significant for a HbA1C of 5.9% and eGFR 7ml/minute/1.73m2.

In addition to stopping glipizide and lowering insulin doses, you counsel the patient and his wife that his target HbA1C % and blood sugars should be which of the following:

A. HbA1C <6.0-6.5%, fasting/preprandial blood sugar 80-130 mg/dL

B. HbA1C <6.5-7.0%, fasting/preprandial blood sugar 80-130 mg/dL

C. HbA1C <7.5-8.0%, fasting/preprandial blood sugar 100-180 mg/dL

D. HbA1C <8.0-8.5%, fasting/preprandial blood sugar 100-180 mg/dL

Correct Answer:

D. HbA1C <8.0-8.5%, fasting/preprandial blood sugar 100-180 mg/dL

Given this patient is elderly with multiple end stage chronic diseases, the goal of diabetes therapy is to minimize any significant hypoglycemic events that may be occurring. The target HbA1C can be adjusted to <8.0-8.5% in these patients with a less stringent fasting and preprandial blood sugar goal of 100-180 mg/dL. Since he has ESRD, sulfonylureas can predispose patients on dialysis to hypoglycemia and should be used very cautiously especially while on insulin therapy.

In older adults treatment goals for glycemic control should be modified over time based on comorbidities, functional and cognitive status, and patient/caregiver preferences.

Case 2.

A 45 year old male with type 2 diabetes comes to see his endocrinologist. His Hba1c had been 6.7 last visit 6 months back. HIs A1c has now has gone up to 8.2 on recent labs. He is currently on metformin 1000mg bid. The patient had been following carb counting but has been non-compliant with his diet lately. He reports fasting glucose in 150-230 range most days. He checks before dinner occasionally and reports glucose usually over 200. He denies any hypoglycemia.

The patient has gained 15 lbs. weight in past 6 months and has a BMI of 39. He does not have any long term CV complications at this time. Family history is remarkable for both parents with type 2 diabetes and dad with coronary artery disease and unilateral above knee amputation. The patient is tolerating metformin well. His BP is well controlled on lisinopril 10mg daily.

In addition to diet modification, which of the following would be the next best treatment option for optimizing this patient's diabetes management?

A. Continue metformin, start Januvia 25 mg daily. Monitor glucose twice a day and have patient follow up in 3 months. Advice patient to monitor glucose before each meal and send glucose profile back for review and adjustment in medication in 2 weeks.

B. Discontinue metformin and start patient on basal bolus regime with Lantus and Humalog. Advice patient to monitor glucose before each meal and send glucose profile back for review and adjustment in medication in 2 weeks.

C. Continue metformin, start Trulicity 0.75mg once a week. Advice patient to monitor glucose before each meal and send glucose profile back for review and adjustment in medication in 2 weeks.

D. Continue metformin, start Jardiance 10mg daily. with plan to add Dpp-4 inhibitor next visit. Advice patient to monitor glucose before each meal and send glucose profile back for review and adjustment in medication in 2 weeks.

Correct Answer

C. Continue metformin, start Trulicity 0.75mg once a week. Advice patient to monitor glucose before each meal and send glucose profile back for review and adjustment in medication in 2 weeks.

This patient has a Hba1c of 8.0. He is obese and currently does not have any CV complications. The best treatment option for him would be to choose a medication that will address not only his high glucose but also his obesity and risk of complications.

The first choice for a second-line therapy by the new American Diabetes Association/European Association for the Study of Diabetes (ADA/EASD) guidelines is GLP1 RAs or SGLT-2 inhibitors for patients with atherosclerotic cardiovascular disease, heart failure, or chronic kidney disease. For patients without these conditions, the ADA/EASD lists five options of noninsulin second-line therapy. On the other hand, the 2019 consensus statement from the American Association of Clinical Endocrinologists/American College of Endocrinology lists nine options, with GLP1 RAs as the first recommended therapy, followed by SGLT2 inhibitors and dipeptidyl peptidase 4 (DPP4) inhibitors, and sulfonylurea as the last option.

Currently Trulicity is the only GLP-1 agent that in addition to improving glucose and having the weight loss benefit will also provide primary prevention for CV disease.

Adding basal/bolus regime is currently not needed as many other options are available. Moreover, adding insulin will not provide the weight loss benefit and primary prevention CV benefit.

-Adding SGLT-2 inhibitor may be a good option however based on the above guidelines and primary prevention benefit associated with Trulicity once weekly GLP-1 seems like the best option. And it will also help him lose weight.

Case 3.

Michael is a 48-year-old gentleman with T2DM since age of 38. He has background of ischemic heart disease, mixed hyperlipidemia and hypertension. He had a delayed presentation of an inferior myocardial infarction 3 months ago. He is currently treated with Metformin XR 1g twice daily, Sitagliptin 100mg once daily, perindopril 5mg once daily, bisoprolol 2.5mg once daily Atorvastatin 80mg once daily. His most recent labs showed:

Creatinine 1.1mg/dL (97.3umol/L), eGFR 76ml/minute/1.73m2, fasting glucose 145mg/dL (8mmol/L), HbA1C 7.6% (60mmol/mol), Albumin/creatinine 28 mg/g (normal<30mg/g), total cholesterol 150mg/dL (3.9mmol/L), with HDL-C 40mg/dL (1.04mmol/L), NT-pro-BNP 754pg/ml (normal for age <125pg/ml).

His clinic checks showed height 172cm, weight 73kg, BMI 24.7kg/m2, BP 134/82mmHg.

You explain to him that he has sub-optimal diabetes control and a HbA1C <7.0% should be sought.

Which of the following therapy interventions is most appropriate?

A. No need to modify his medications, only reviewing and optimizing lifestyle aiming for reduction in refined carbohydrates and increase in physical activity

B. Adding Gliclazide SR 60mg before breakfast

C. Adding Dapagliflozin 10mg once daily

D. Stopping Sitagliptin and starting liraglutide starting at 0.6mg daily and increase dose weekly to 1.8mg daily

Correct Answer:

C. Adding Dapagliflozin 10mg once daily

Lifestyle modifications are important and should be optimized regardless of treatment modality but should be adjunct to other therapy modifications given the importance of achieving target as soon and safe as possible.

Gliclazide may help improve his diabetes control but will put him at risk of hypoglycemia which can be detrimental in his condition. Also, Gliclazide promotes weight gain which is better avoided in this patient.

Switching to a GLP1RA is a reasonable option especially with the cardiovascular benefits, however, most likely GLP1RA cause nausea, at least during the initiation period and are given as SC injections which can reduce compliance.

Given the late presentation of his inferior MI and the mild rise in NT-pro-BNP the risk of heart failure is high. Dapagliflozin, and SGLT2 inhibitor with diuretic and glucosuric properties, would suit the patient very well with proven cardiovascular benefits including heart failure, ease of intake (oral), minimal risk of hypoglycemia, and weight reduction potential.

Case 4:

A 64 year-old female presents to your clinic for management of type 2 diabetes mellitus diagnosed fifteen years ago. Her medical history includes coronary artery disease (s/p CABG) and ischemic cardiomyopathy (ejection fraction 45%) complicated by two hospital admissions for congestive heart failure exacerbation within the past year. She was recently diagnosed with diabetic gastroparesis.

Her glucose-lowering regimen solely comprises Lantus 30 units daily. Fingerstick glucose data discloses infrequent fasting hypoglycemia.

Physical examination: BP 125/76 mmHg, heart rate 72 bpm, BMI 36 kg/m2. Sensation is intact to monofilament testing in both feet.

Pre-clinic lab assessment:

Normal serum electrolytes

eGFR 56 ml/minute/1.73m2

HbA1c 7.8%

Random urine microalbumin/Cr 150 mcg/mg creat (normal < 30)

Which of the following would be the next best treatment option?

A. Increase the dose of Lantus

B. Add Saxagliptin

C. Add Canagliflozin

D. Add Dulaglutide

Correct Answer

C. Add Canagliflozin

Canagliflozin is an SGLT2 inhibitor that has been approved by the FDA to reduce the risk of major cardiovascular events in adults with type 2 diabetes and established cardiovascular disease1. Moreover, it is also indicated to reduce the risk of end-stage kidney disease, doubling of serum creatinine, cardiovascular death, and hospitalization for heart failure in adults with type 2 diabetes mellitus and diabetic nephropathy with albuminuria. Relative to placebo, participants who received canagliflozin in the CREDENCE trial experienced a 30% reduction in the risk of the primary composite endpoint, which included end-stage kidney disease, doubling of serum creatinine, and renal or cardiovascular death2.

Dulaglutide is a once weekly injectable glucagon-like peptide-1 receptor agonist (GLP-1 RA). It received FDA approval for the reduction of major cardiovascular events (MACE) in adults with type 2 diabetes who have established cardiovascular disease or multiple cardiovascular risk factors3. Long-term use of dulaglutide is also associated with reduced composite renal outcomes - defined as the first occurrence of new macroalbuminuria (UACR >33 9 mg/mmol), a sustained decline in eGFR of 30% or more from baseline, or chronic renal replacement therapy - in people with type 2 diabetes4. Nevertheless, dulaglutide would be an unsuitable option in this scenario due

to the presence of gastroparesis. GLP-1 RAs slow down gastric emptying and could therefore exacerbate gastroparesis.

Saxagliptin, a DPP4 inhibitor, is unsuitable for the lady in question, who has experienced systolic congestive heart failure exacerbations. Results from the SAVOR-TIMI 53 trial demonstrated an increased risk of heart failure hospitalization with the use of saxagliptin5.

Increasing the dose of Lantus would be a reasonable option, but not the best next step. As it is, she already experiences some degree of hypoglycemia. Thus, increasing the dose of insulin could increase the frequency of hypoglycemic episodes. Furthermore, monotherapy with insulin would not address the presence of CKD secondary to diabetic nephropathy or cardiovascular disease.

Case 5:

A 29 year old female with T1DM since age of 11, treated with multiple daily injection using Insulin Detemir 20 units at night and Insulin Aspart 1 unit per 10 grams of carbohydrates per meal.She informs you that she is pregnant at 8 weeks gestation and she is asking your support. She has impaired hypoglycemia awareness with GOLD score of 5 with a recent history of severe hypoglycaemia requiring administration of Glucagon injection by partner. She has mild background diabetic retinopathy and raised microalbuminuria. A trial of insulin pump in the past was not successful as patient found it too intrusive. Her pre-clinic labs assessments showed:

HbA1C 7.6%

eGFR 68ml/minute/1.73m2

ACR 145mg/mmol/ (Normal <30)

Hb 112g/L (Female 120-160g/L)

On examination you find:

BMI 23.4kg/M2

BP 132/78mmHg

Heart rate 82bpm

Injection site examination reveals multiple lipohypertrophy legions in the abdomen, but not the thighs or upper arms.

Which of the following is likely to make the most difference to her diabetes and pregnancy outcomes?