



REGIONAL WORKSHOP REGISTRAR CASE

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The first visit...

- 54F with “diabetes”
- Fit and well, normal weight, no other significant medical history
- On basal-bolus insulin for “years”
- Frequent nocturnal hypoglycaemic episodes, asks “can I go onto tablets instead of insulin”



What do you want to know?
What would you do?



Latent Autoimmune Diabetes in Adults

- Patient diagnosed with LADA by endocrinologist (age 42; GAD antibody titre 63 U/mL)
- LADA is a subtype of T1DM, characterised by phenotypically similar presentation to T2DM but with progressive autoimmune β -cell failure and progression to insulin dependence (6 months to 12 years).
- Defined by presence of diabetes-specific autoantibodies (islet cell antibodies, GAD antibodies).
- β -cell failure defined as undetectable C-peptide level (marker of insulin production).
- Insulin therapy is recommended from diagnosis (as β -cell function is impaired from diagnosis).



Case continued...

- Lantus reduced to 2units nocte
- Commenced on metformin and dapagliflozin (sodium glucose co-transporter 2 [SGLT2] inhibitor)



Three weeks later...

- BSLs stable between 7-10mmol/L
- Patient complains that over the past three weeks she has had increasing nausea, abdominal pain, lethargy and SOB.
- OE: mottled skin, kussmaul breathing



What are your differentials?
What initial investigations would you do?



What happened next...

Patient transferred to emergency department

Result summary	Result
Respiratory rate	26 bpm
Blood pressure	140/80 mmHg
Heart rate	120 bpm
Blood pH	6.98
Blood glucose level	14.4 mmol/L
Blood lactate	1.7 mmol/L
Blood ketones	6.3 mmol/L
Urine glucose	++++
Urine ketones	80 mg/dL (large)



Euglycaemic diabetic ketoacidosis

- EuDKA – presentation of DKA characterised by blood glucose levels that are normal or only slightly increased.
- Reported complication of sodium glucose co-transporter 2 (SGLT2) inhibitors in T2DM and case reports of this occurring in T1DM with empagliflozin.
- DKA predictable given insulin reduction but dapagliflozin altered presentation ?augmented DKA ?prevented hyperglycaemia



Sodium glucose co-transporter 2 inhibitors - used to treat type 2 diabetes

Safety advisory - risk of diabetic ketoacidosis

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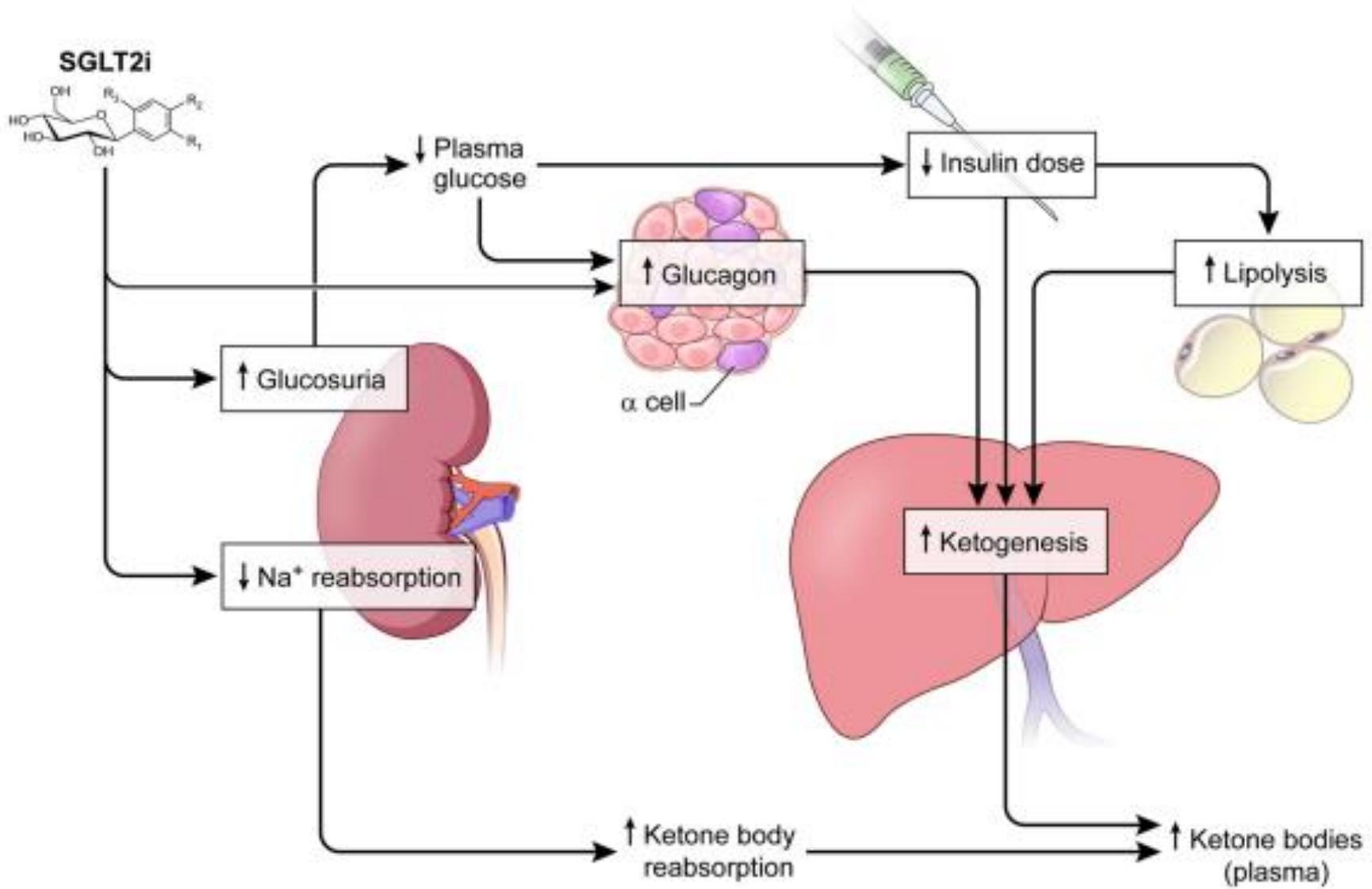
Consumers and health professionals are advised that serious cases of diabetic ketoacidosis (DKA) have been reported in patients taking prescription medicines that are inhibitors of sodium glucose co-transporter 2 (SGLT2).

These medicines include canagliflozin, dapagliflozin or empagliflozin, which are used to help lower blood sugar levels in patients with type 2 diabetes.

Early signs and symptoms of DKA include abdominal pain, nausea, vomiting, anorexia, excessive thirst, difficult breathing, unusual fatigue and sleepiness. If DKA is not diagnosed early and treatment initiated, more serious signs and symptoms including dehydration, deep gasping breathing, confusion and coma can potentially develop.

DKA occurs most commonly in patients with type 1 diabetes, although it can occur in type 2 diabetes. It is usually accompanied by high blood glucose levels.

However, in a number of the cases of DKA associated with SGLT2 inhibitors, patients demonstrated only a moderately increased blood glucose level. This could lead to delayed diagnosis and treatment.





Case continued...

- Patient admitted to ICU
- Commenced on DKA protocol (rehydration, insulin, dextrose and electrolyte replacement)
- Recommenced on basal-bolus insulin regimen



Should an SGLT2 inhibitor be used?

- SGLT2 inhibitors are only approved in T2DM.
- Increasing interest in using SGLT2 inhibitors off-label in T1DM (weight loss, improved glycaemic control when used as adjunct to insulin)
- SGLT2 was inappropriate in this patient due to insulin dependence and occurred due to confusion over diagnosis.



How can euDKA be prevented?

- Clinician awareness: if patient becomes unwell on SGLT2 inhibitor test ketones if concerned even if BSL normal.
- Patient education: signs and symptoms of DKA, test ketones on glucose meter even if blood sugars normal.
- Review SGLT2 inhibitor during times of fasting (surgery, illness) – consider ceasing until full intake resumed.



References

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