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Spontaneous hypoglycaemia induced by ACE-inhibitor: A case report

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Background:

Hypoglycaemia is rare in people without diabetes. Apart from anti-diabetic medications, there are other medications which are known to cause hypoglycaemia (Table1). More recently, ACE-inhibitor has been recognised in increasing risk of hypoglycaemia among patient with underlying diabetes mellitus; however there has not been any report of hypoglycaemia due to ACE-inhibitor among non-diabetic patients.

Case details:

65 year old man with background of congestive cardiac failure, previous pulmonary TB (1997), bronchiectasis and pulmonary fibrosis (long term oxygen therapy) was admitted for exacerbation of bronchiectasis. He completed a course of antibiotics and steroid treatment. While awaiting discharge, he had two episodes of spontaneous hypoglycaemia (lowest blood glucose being 2.2mmol/l on venous sample). He was referred to the Endocrine team at this point. On further questioning, he admitted similar episodic "funny turns" associated with sweating and feeling faint over the previous 18 months. These episodes occurred in the morning, up to 3 times per month with no precipitant or prodrome and resolved spontaneously after about an hour. Consumption of carbohydrates seemed to aid symptom resolution.

Investigations:

Subsequent inpatient investigations including short synacthen test and coeliac screen were normal. He also underwent a prolonged fast which was abandoned by the patient after 48-hours with no further recorded hypoglycaemia as an inpatient. Thus it was not possible to measure Insulin or C-peptide level. He was discharged from hospital with a glucometer. In the outpatient clinic, he reported further episodes which corroborated with low self-monitored glucose readings (2.3-3.6mmol/l). A thorough medication review confirmed that his symptoms were contemporaneous with the commencement of the anti-hypertensive drug Ramipril. This prompted substitution of his Ramipril to Losartan. Since then he has returned to two clinic reviews over five months period and has not reported any further hypoglycaemic episodes potentially suggesting ACE inhibitors as being the cause.

Discussion:

Among diabetic patients, ACE-inhibitor is one of the recognised agents which can cause hypoglycaemia. The ccausative mechanisms are thought to include increased stimulation of insulin release, reduced insulin clearance and interference with glucose metabolism (Morris et al).

However among normoglycaemic patients, there is no current literature to suggest ACE-inhibitor increases risk of hypoglycaemia. Therefore we report a rare case of drug induced hypoglycaemia in a non-diabetic patient caused by Ramipril. Our case illustrates the importance of considering rare drug side-effects with unusual presentations.

Table 1: Drugs and therapies reported to cause hypoglycaemia

Drug	Mechanism
Ethanol	Inhibits gluconeogenesis
Salicylates	Unknown
Haloperidol	Unknown
β-Adrenergic blockers	Blocks catecholamine-induced glycogenolysis
Timolol ophthalmic preparation	
Disopyramide	Increased insulin secretion
Pentamidine	Islet cell toxin
Trimethoprim-sulfamethoxazole	Increased insulin secretion
Propoxyphene	
Quinine	Unknown: increased insulin secretion
Quinidine	Increased insulin secretion
Total parenteral nutrition	Insulin therapy
Acute glucocorticoid withdrawal	Adrenal insufficiency

Table 2: Common causes of non-diabetic hypoglycaemia

Ethanol
Exercise
Drugs
Postprandial
- Reactive hypoglycaemia
- After gastric surgery

Critical illness
- Hepatic, renal, cardiac failure
- Sepsis

Endocrine deficiencies
- Hypopituitarism
- Addison's disease

Diet
- Fasting
- Malnutrition

Endogenous hyperinsulinism
- Insulinoma

References

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