CASE REPORT

Re-occurrence of pancreatic insulinoma: an usual cause of hypoglycaemia

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SUMMARY

A 42-year-old woman presented to her general practitioner (GP) with episodes of feeling 'shaky' exacerbated by physical exercise and prolonged fast. She was previously diagnosed with an insulinoma in 2006 (serum glucose 1.6 mmol/l, serum insulin 3.1 mIU/l and serum C peptide <165 pmol/l). CT abdomen/transabdominal ultrasound revealed a 1 cm insulinoma in the uncinate process of the pancreas and the patient later underwent pancreatic enucleation in 2006. Postpancreatic enucleation, 72 h fast was negative. The patient remained asymptomatic postoperation and re-presented to a locum GP 6 years later with initial symptoms. She was reviewed during her annual follow-up and, owing to concerns relating to her background, she was admitted to the specialist endocrine department for further investigations. A 72 h fast was positive for hypoglycaemia with serum glucose level 1.8 mmol/l, serum insulin 8.6 mIU/l and serum C peptide 443 pmol/l.

BACKGROUND

Hypoglycaemia is one of the most encountered medical emergencies which need to be dealt with effectively.¹ Although most patients with this symptom will be diabetic, a small proportion will have an underlying neoplastic cause.¹ Insulinoma is a rare pancreatic neuroendocrine tumour which produces insulin.²⁻³ It is a rare but important cause of hypoglycaemia.⁴ The majority of cases are adenomas which are benign (over 90%), solitary (over 90%) and within the pancreas (over 99%) suggesting promising results following surgery.⁵⁻⁶ About 90% of these tumours measure less than 2 cm and can equally be found in the head, body and tail of pancreas.³ Therefore, accurate localisation prior to surgery is of paramount importance and this still remains a challenge to radiologists.⁵ The diagnosis is made clinically, biochemically and with the aid of imaging.⁵ Multiple insulinomas found in a patient are usually associated with other neuroendocrine tumours found in relation to multiple endocrine neoplasia type I.³ Surgery, via duopancreatectomy, distal pancreatectomy or enucleation, is very successful and is usually curative.³ The recurrence of insulinoma is very low postsurgical resection.⁶ In the present report, the patient presented back with symptoms suggesting a recurrence of the insulinoma following surgery which was performed 6 years ago.

CASE PRESENTATION

A 42-year-old woman presented to her local general practitioner in 2006 with a history of episodic light-headedness and associated transient blurring vision, lasting up to 20 min, associated with sweating, irritability and craving of sweets. She reported no particular provoking factors and episodes usually resolved spontaneously. There were no associated palpitations, chest pain, loss of consciousness, faints or seizures. Unfortunately, because of the lack of a functioning glucometer, she was unable to measure capillary blood glucose during these episodes. Family history included paternal grandfather type 2 diabetes mellitus and maternal grandfather adrenal tumour. She reported never smoking and nil alcohol excess.

A prolonged supervised 72 h fast was performed. After 48 h, she developed hypoglycaemia with serum glucose levels of 1.6 mmol/l, serum insulin 3.1 mIU/l and serum C peptide of <165 pmol/l. Haemoglobin A1c was 4.6% (4.3–6.1%). CT and MRI revealed a 1 cm lesion in the uncinate process and she was started on diazoxide 50 mg thrice a day. However, she developed a full body maculopapular rash within the first day. She later underwent enucleation of pancreatic lesion in 2006. Postoperatively her fasting glucose was normal (table 1).

The patient remained symptom-free for 6 years and represented during her annual with initial symptoms. She was admitted for a 72 h fast which proved positive, 68 h into the fast with serum glucose of 1.8 mmol/l, serum insulin 8.6 mIU/l and serum C peptide of 443 pmol/l. MRI pancreas revealed 1 cm lesion in the head of pancreas and the patient is keen to undergo further surgery to remove the pancreas.

Table 1 Interpretation of 72 h fast^{9 10}

	Normal response	Borderline	True insulinoma
Glucose (mmol/l)	2–2.2	2–2.2	2–2.2
Insulin (pmol/l)	<25	25–50	>50
C peptide (pmol/l)	<75	100–300	>300

Ketones should be suppressed with insulinoma, even though patient is fasting, because of the excess insulin.⁹

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INVESTIGATIONS

- ▶ 72 h fast.
- ▶ MRI of pancreas.

DIFFERENTIAL DIAGNOSIS

Causes of hypoglycaemia.

TREATMENT

Surgical resection.

OUTCOME AND FOLLOW-UP

Whipple procedure.

DISCUSSION

Insulinomas are very rare neuroendocrinal tumours affecting around 4/1 000 000 people every year.⁵ The main pathophysiological mechanism in patients with this disease is the inability to suppress insulin production despite one being hypoglycaemic.¹ This leads to neuroglycopenia and adrenergic symptoms such as confusion, visual changes, dizziness and palpitations⁷ as observed in our patient. A 72 h fast is the recommended initial diagnostic test.⁷ This is positive if Whipple's triad is present and this is defined as a serum glucose level below 50 mg/dl, the presence of neuroglycopenic features and the relief of these symptoms following glucose administration.⁸ An insulin/C peptide ratio of less than 1.0 will ascertain the diagnosis of an insulinoma.⁷ Once the diagnosis is confirmed, surgical treatment is conducted, either via a pancreatic resection or tumour enucleation, depending on the number of tumours present within the pancreatic organ.⁶ Following surgery, insulinomas very rarely recur (3%).⁶

Competing interests None.

Patient consent Obtained.

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Learning points

Interpretation of 72 h fast^{9 10}

- ▶ Young women can run at serum glucose levels in the region of 2.2–3.0 mmol/l without symptoms.
- ▶ True hypoglycaemia must be demonstrated (glucose= 2–2.2 mmol/l), before we are able to either interpret insulin results or consider insulinoma. Insulin and endogenous insulin production (estimated by C peptide) should be low.
- ▶ If hypoglycaemia is with raised insulin but low C peptide, consider self-administration of insulin.
- ▶ If hypoglycaemia is with raised insulin and raised C peptide, make sure sulfonylurea screen is negative.

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