CASE REPORT

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Hungry and Heavy, Hidden Tumour and High Insulin: A Saga of Insulinoma

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Abstract

Hypoglycaemia in non-diabetics can be due to Renal failure, Addison's disease, Liver failure and due to drug effects. Excessive endogenous insulin secretion from pancreas is a rare cause of hypoglycaemia. We hereby report the case of a young male who presented primarily for evaluation and treatment of recent excessive weight gain. History revealed episodes of sweating and general weakness over several months. The patient was resorting to excessive feeds to counter these episodes. Investigations revealed the cause to be an insulinoma. Surgical removal of the tumour corrected the symptoms and he lost significant weight after surgery.

Key words: Whipple's Triad, neuroglycopenia, islet cell tumours, obesity.

Introduction

Hypoglycaemia is commonly encountered in patients on therapy for diabetes, but also occurs in patients with renal insufficiency, liver disease, malnutrition, or sepsis. Other but less common causes are insulin secreting pancreatic and some non-pancreatic tumours. Insulinomas are the most common functioning endocrine neoplasm of the pancreas having inappropriately high secretion of insulin[1]. Patients have hypoglycaemic episodes, more characteristically fasting hypoglycaemia. However, the presenting symptoms of insulinoma vary a great deal and most of the time the condition goes unrecognised and undetected for many years. We hereby report the case of a young male who came to hospital primarily seeking medications for weight loss but after evaluation was found to have an insulinoma.

Case report

A 24-year-old male shopkeeper presented to the Medicine Out Patient Department of our hospital for consultation regarding obesity. He and his parents had noted significant increase in body weight over last few months. On questioning it was revealed that he was having episodes of light headedness associated with diaphoresis, palpitations, tremulousness, feeling of weakness, for the last one-and-a-half years, which were relieved after eating something – especially sugary foods. Over-exertion brought out such episodes more frequently. The parents had noted that the patient was consuming more frequent feeds to overcome the repeated episodes of weakness. He had ignored the symptoms and had not consulted any doctor prior to the present consultation. The patient was admitted at his request for further evaluation and investigations.

He had no history of diabetes or thyroid disease. He was not on any medications for other ailments. He was not taking complementary food or medical supplements. His diet was omnivorous. There was no history of disturbed sleep or snoring. He denied smoking and alcohol habits.

On examination he was obese with weight 90 kg, height 168 cms, BMI 31.9 kg/mt^2. Blood pressure 150/90 mmHg, and respiratory rate 20 per minute. The abdomen showed no palpable masses. Cardiovascular and respiratory systems were normal, and on nervous system examination there were no deficits.

Haemogram was normal. Urea, creatinine, electrolytes, chest X-ray, ECG were within normal limits. RBS was 60 mg/dl. A fasting Blood sugar done next day was 57 mg/dl, HbA1c was 5.2%. Ultrasound abdomen was reported as normal. However, in view of the clinical picture, highly suggestive of an insulinoma, a computed tomography of the abdomen with contrast was done which demonstrated a well-defined hyper-vascular lesion involving pancreas. There were no intraabdominal lymph nodes seen.

Other investigations were as follows: Fasting Insulin level was elevated at 44.8 micU/l (normal range 2 to 25 micU/ml). There was elevated fasting C-peptide level of 11.4 ng/ml (normal range 0.81 to 3.85 ng/ml). Serum cortisol level was 6.2 µgm/dl (normal 4.82 to 19.5 µgm/dl). Thyroid function tests were within normal range.

The patient underwent surgical removal of the pancreatic mass (Fig. 1). Post-operative glucose levels were never in

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the hypoglycaemic range and were always more than 100 mg/dl. Histopathological evaluation (Fig. 2, 3) revealed nests of cells separated by well vascularised thin fibrous stroma. The neoplastic cells had round, moderately anisomorphic nuclei with small nucleoli and eosinophilic granular cytoplasm. This was consistent with an endocrine neoplasm – insulinoma of pancreas.

The patient was discharged in good health with proper normal levels. Insulin and C-peptide levels were not repeated because of symptomatic improvement. Subsequent follow-up showed significant weight loss to reach 68 kgs and normalisation of BMI to 24.1 kgm/mt^2.

Discussion

The incidence of insulinoma is around 1 to 4 per million per year[2,3]. More commonly, insulinoma is a single benign tumour, and only in 5.8% of cases, it can be malignant[2]. In patients with insulinoma, there is continued production of insulin in spite of a lower glucose level. Fasting hypoglycaemia is the most characteristic finding of insulinoma, reported in 73% of the population and around 20% of patients have both fasting and post-prandial hypoglycaemic symptoms[4].

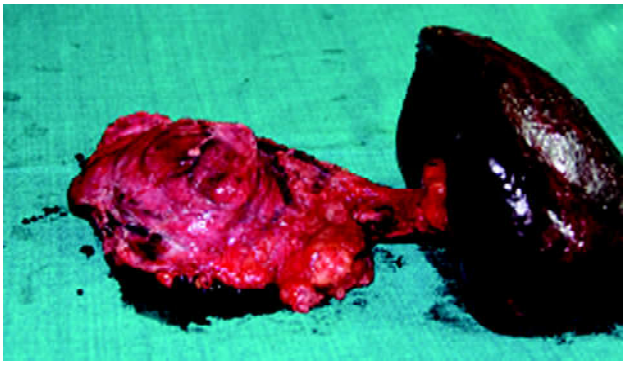

Fig. 1: *Post-operative specimen showing the tumour. The spleen is also seen.*

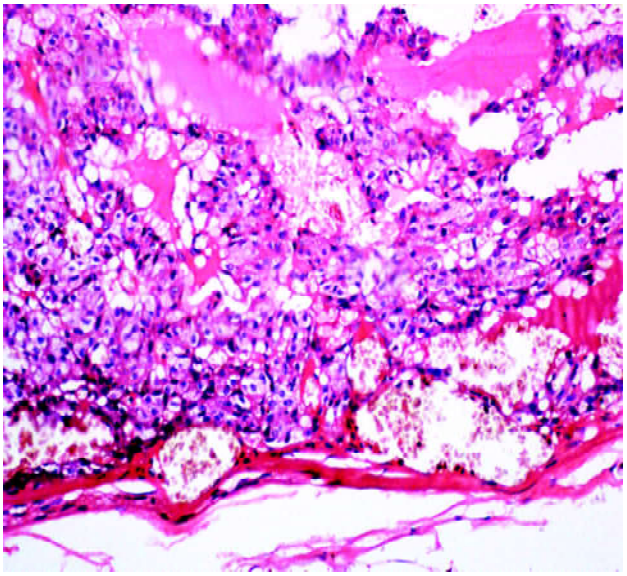

Fig. 2: *Histopathology of biopsy material. Nests of cells separated by thin fibrous stroma. Neoplastic cells are round, have moderately anisomorphic nuclei and eosinophilic granular cytoplasm.*

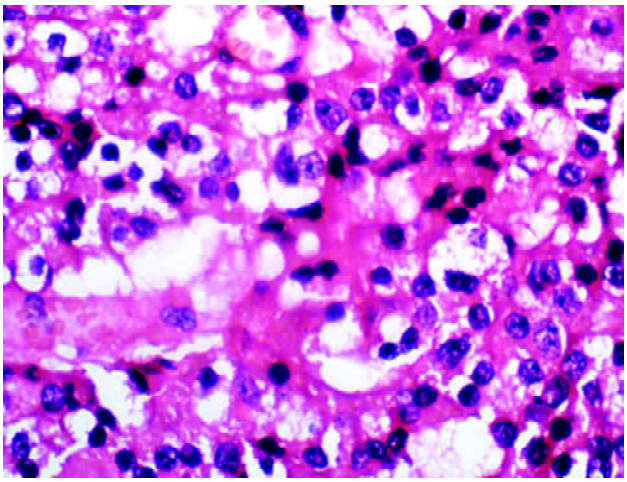

Fig. 3: *Histopathology of biopsy material. The characteristic "Salt and Pepper" chromatin is seen. Suggestive of solid pseudopapillary tumour.*

Hypoglycaemia can present with sympathoadrenal activation symptoms, including palpitations, tremulousness, and diaphoresis. Severe hypoglycaemia can cause neuroglycopenic symptoms, including blurry vision, confusion, seizures, or a change in behaviour. Amnesia of the hypoglycaemic event is common.

A 72-hour fast is the gold-standard test for diagnosing insulinoma[5]. It is useful when the Whipple triad is not observable[6]. The combination of plasma glucose concentration below 55 mg/dl, insulin level greater than or equal to 3 microUnits/ml, C-peptide level greater than or equal to 0.6 ng/ml, and a simultaneous negative sulfonylurea level indicates that the hypoglycaemia induction is by hyperinsulinaemia.

CT detects 70 to 80% of the tumours where the insulinoma usually presents as a small solid mass, which enhances after contrast[7]. Magnetic resonance image (MRI) detects about 85% of the insulinomas that seem to enhance homogeneously after gadolinium administration[8]. 90% of insulinomas are benign, and it is essential to surgically remove this tumour in view of potentiality to cause hypoglycaemia-related deaths. Surgical resection is recommended for local disease[9]. If the tumour is unresectable or already metastasized, or if the patient is a poor surgical candidate, diazoxide is an option[10].

Insulinoma is known to have varied presentations in different age and gender groups. Suresh *et al*[11] reported the case of a young female patient presenting with unwitnessed cardiac arrest later diagnosed as insulinoma. In another case report Eichelberger *et al*[12] describe the case of a pancreatic insulinoma in an 86-year-old female, a rare presentation at that age. There was absence of clinical symptoms for up to one year prior to hospitalisation. In most other settings also the diagnosis of an insulinoma is done late inspite of the availability of improved diagnostic techniques.The median duration of symptoms before diagnosis remains variable and can be 12 - 18 months on an average[13].

Our patient was diagnosed after two years of onset of symptoms. He was having episodes of hypoglycaemia manifesting as hunger, but he was "managing" the same by overeating, and this gradually led him to obesity. Notably, he did not have other symptoms such as palpitations, sweating, etc. The unique feature of this case is that the patient actually sought medical care and therapy for obesity and not for any of the hypoglycaemic symptoms. This case once again reveals the varied presentation of an insulinoma.

Conclusion

A high index of suspicion towards insulinomas in all young adults presenting with suggestive symptoms can provide early diagnosis leading to better care – and even cure – in this potentially lethal condition. It is essential for physicians to keep in mind insulinomas as a rare cause of weight gain in patients with hypoglycaemic episodes.

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