Solitary fibrous tumour: An unusual cause of Hypoglycemia

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Citation

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Abstract

INTRODUCTION

Solitary fibrous tumours are rare spindle cell neoplasms with diverse clinical and pathologic features. Non-islet cell tumour hypoglycaemia (NICTH) is a paraneoplastic syndrome occurring in patients harbouring large, slow growing tumours. Diagnosis is based on clinical suspicion of unexplained hypoglycaemia and serum biochemistry. IGF II is one of the insulin-like peptides commonly thought to be responsible for NICTH. Surgical removal of the IGF II secreting tumour is the reatment of choice, if possible.

We report an interesting case of a young woman who presented with seizures and hypoglycaemia and was found to have a retroperitoneal solitary fibrous tumour,which had been secreting insulin-like growth factor-II.

CASE REPORT

A 29 years old patient was seen in Accident & Emergency department with a history of seizures. She was unresponsive on admission and was noted to have a plasma glucose level of 2.1mm/L.There was a rapid response to a 50ml intravenous bolus of 50% glucose solution. Her BMI was 21 and was not on insulin or oral hypoglycaemic agents and had no history of diabetes. However, she had a past history of a laparotomy in New Zealand in 2001,for partial excision of a large low grade fibrous tumour from the pelvis.

On physical examination, a large pelvic mass was observed and an MRI abdomen/pelvis was organised; which revealed large, lobulated masses arising out of pelvis,the largest with a diameter of 10cms.During an episode of hypoglycaemia, her biochemistry revealed serum glucose of 1.9 mol/l, non-detectable levels of insulin and C-peptide, IGF I levels of 2.0 nmol/l and IGF II levels of 137.3 nmol. There was no evidence of pulmonary, hepatic or brain metastasis. She underwent a laparotomy and was found to have two large extremely vascular tumours; one adherent to uterus, right ovary and sigmoid colon; the second one in the pre sacral region.A subtotal hysterectomy was performed and one of the masses removed; pre sacral tumour mass was left undisturbed. She lost approximately 4 litres of blood intraoperatively. She was commenced on diazoxide and prednisolone for the control of hypoglycaemic episodes.

Histology confirmed a recurrent aggressive solitary fibrous tumour (mitotic rate of 5 per10 hpf).Spindle cell proliferation with variable cellularity, mixed with collagen was seen. Immunohistochemistry showed cells staining strongly positive for CD34 and vimentin. No significant estrogen or progesterone receptor staining was identified. Peritoneal washings and omentum showed no evidence of tumour. Further MRI confirmed a 10cm mass in the pre sacral area, firmly adherent to the sigmoid colon.

She, then went forward for a further debulking surgery at the specialist oncologist centre. However, macroscopic disease was still left in situ, for which she received post operative adjuvant radiotherapy.

DISCUSSION

Solitary fibrous tumours are rare spindle cell neoplasms with diverse clinical and pathologic features and have occasionally been described in association with hypoglycaemia. They have been found in the pleura, pericardium and peritoneum but also non-serosal sites such as the orbit, lung parenchyma, thyroid, adrenal gland, parotid gland, spinal cord, pancreas, renal capsule and uterus. Benign and malignant forms of the tumor occur, the benign variant being three to four times more common than the malignant.

Figure 1

Table 1: Histological classification of 68 tumours producing NICTH(non-islet cell tumour hypoglycaemia) through overproduction of IGF-II V Marks and J D Teale;

Histology	Number
Carcinoma	31
Lung	7
Pancreas	6
Stomach	5
Undifferentiated	3
Adrenal	2
Kidney	2
Oesophagus	2
Ovary	1
Prostate	1
Breast	1
Larynx	1
Sarcoma/fibroma	23
Fibroma	6
Mesothelioma	5
Fibrosarcoma	4
Haemangiopericytoma	4
Neurofibroma	1
Leiomyosarcoma	2
Sarcoma of kidney	1
Hepatoma	4
Carcinoid/neuroendocrine	1
Unknown	9

Presenting features usually include weight loss, nausea, vomiting and abdominal fullness or the finding of a mass in an asymptomatic patient. Females appear to be more commonly affected than males with a ratio of approximately 2:1;the age of presentation appears to be varied.

Microscopically they consist of strands of spindle cells with cellular atypia, necrosis and mitotic figures in some cases; SFTs are therefore felt to have malignant potential. Positive immunohistochemical staining with CD34 and Vimentin are characteristic of SFT. Reactivity of the tumor cells to CD34 antigen on immunohistochemical analysis suggests the mesenchymal origin of such tumors.

SFT's producing hypoglycaemia secondary to IGF-II expression by the tumour belong to the syndrome known as non-islet cell tumour hypoglycaemia (NICTH). Diagnosis is characterised by hypoglycaemia, suppressed serum insulin, C-peptide and growth hormone and low serum IGF-I but normal or elevated serum levels of IGF-II. IGF II is one of the insulin-like peptides commonly thought to be responsible for NICTH.IGF II may be produced by the tumour, or it may be produced as a larger precursor (big IGF II) by the tumour. Insulin and IGF I can be suppressed by IGF II, so an abnormal IGFI: IGF II ratio may indicate an IGF II secreting tumour.

Figure 2

Table 2: Diagnostic parameters of NICTH.

	NICTH patients	Control hypoglycaemic subjects*
Age (years)	16 ±15 (30-91)	
Glucose (mmol/l)	2.4±2.5	<3.0
Immunoreactive insulin (pmol/l)	<25	Variable, depending on cause
C-peptide (pmol/l)	<75	Variable, depending on cause
b-hydroxybutyrate (mmol/l)	143±151	>300**
Growth hormone (mU/l)	4.6±6.2	>10*
Total IGF-I (nmol/l)	5±2	18±14
Total IGF-II (nmol/l)	102±35	68±12
IGF-II:IGF-I molar ratio	21.8±10.7	3.8±1.5
'Big' IGF-II (nmol/l)	20.1±6.0	9.8±2.0

* Including hyperinsulinism: iatrogenic and spontaneous.
** Excluding hypoglycaemia caused by hyperinsulinism: iatrogenic or spontaneous.

Surgical removal of the tumour results in resolution of symptoms of hypoglycaemia and normalisation of biochemical markers. While awaiting surgery or in inoperable cases, growth hormone administration and radiotherapy/palliative chemotherapy have been shown to alleviate hypoglycaemic symptoms in NICTH. Large doses of prednisolone may bring remarkable improvement in both glucose homeostasis and other biochemical markers of NICTH.

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