Symptomatic hypoglycaemia due to high IGF-2 levels in a patient with adrenocortical carcinoma

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Case History:
We present a case report on a 44-year-old Nigerian woman (living in the United Kingdom for the past 10 years) who was admitted to hospital following an episode of collapse. Paramedics reported low blood sugar on CBG testing. (1.1 mmol/l) The patient reported a 3-week history of facial swelling and acneiform rash, some chest tightness and abdominal distension. She was overweight, though she reported recent weight loss.

Investigations and Results:
Fasting glucose was 1.9 mmol/l with undetectable insulin, low C-peptide and IGF-1 and low IGF BP3 levels of 1.6 mg/l (reference range 3.3–6.6). Her potassium levels were between 3.4–3.8 mmol/l (reference range 3.5–5). Her IGF-2 levels were elevated at 75 nmol/l and repeat IGF-1 levels were low 4.4 nmol/l (reference range 9–40) with a IGF-2/IGF-1 ratio of 17.0 (reference range <10). Urinary steroid profile showed markedly elevated levels of tetrahydro 11-deoxycortisol metabolites and an unusual metabolite identified as 16α-hydroxyaetiocholanalone (3687 µg/24h), known to be associated with adrenocortical carcinoma. Her testosterone and dihydrotestosterone were abnormally increased (2.7 nmol/l; reference range 0.5–2.6 and 2.1 nmol/l; reference range 0.4–1.5), respectively. Baseline cortisol levels were 672 nmol/l and overnight 1 mg dexamethasone suppression test failed to suppress with 0900 am cortisol at 702 nmol/l. Abdominal ultrasound revealed a left renal/adrenal mass and prompted a computed tomography which demonstrated a large heterogeneous retroperitoneal mass occupying the left upper quadrant measuring 16 cm (CC) x 14 cm (AP) and containing multiple vessels. The left kidney was displaced inferiorly and the body/tail of pancreas superiorly.

Treatment:
The patient underwent enbloc left adrenalectomy and nephrectomy with peri-aortic and inter-aortocaval lymphadenectomy and partial resection of inferior venacava. The tumour weighed 1677g. Histopathological examination showed adrenal cortical carcinoma with anaplastic features extensively invading the soft tissues and with massive vascular (venous) invasion.

Conclusions and discussion:
Post-operatively, the symptoms of facial swelling and rash resolved and no further episodes of hypoglycaemia occurred. Her IGF-2 Levels post operatively were 40.9 nmol/l and an IGF-2 to IGF-1 ratio was 1. Post-operative testosterone levels were normal at 0.7 nmol/l. The patient has been commenced on mitotane post-operatively.

Adrenocortical carcinomas, although rare, are a well recognised cause of hypoglycaemia (1, 2, 3). It has been reported that there is an up-regulation in production of IGF-2 in adrenocortical cancer which is implicated in causing hypoglycaemia. (4)

References: