Metabolic Syndrome in Adrenal Incidentaloma

AMILTHAN

Department of General Surgery, KILPAUK MEDICAL COLLEGE AND HOSPITAL

Abstract:
Adrenal incidentaloma is an adrenal mass that is discovered serendipitously during a radiological examination performed for indications other than evaluation of adrenal disease. Incidentally discovered adrenal masses are mostly benign, asymptomatic lesions often arbitrarily considered as non-functioning tumours. Recent studies have, however, reported that subtle cortisol production and abnormalities in the hypothalamo-pituitary-adrenal axis are more common than previously thought, and referred to as subclinical Cushing’s syndrome. Subclinical Cushing’s syndrome is found more in association with Diabetes Mellitus, Hypertension, Obesity and Hypertriglyceridemia. The purpose of this case study is to investigate a case of adrenal incidentaloma, its hormonal manifestation and associated metabolic conditions, clinical outcome and effectively manage with post-operative follow up to evaluate the improvement in biochemical and clinical parameters. It was concluded that Adrenal incidentaloma should be suspected in a patient presenting with metabolic syndrome and surgery improves metabolic parameters.

Keyword: Adrenal incidentaloma, Metabolic syndrome, Subclinical cushings syndrome, adrenalectomy

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Adrenal incidentaloma encompasses a heterogeneous spectrum of pathologic entities including primary adreno-cortical and medullary tumours, benign or malignant, hormonally active or inactive lesions, metastases and infections. Once an adrenal mass is discovered, investigations should be done to rule out malignancy and to evaluate the endocrine activity of the mass.

Subclinical Cushing’s syndrome refers to subtle autonomous cortisol hypersecretion that is insufficient to generate the typical, clinically recognizable overt syndrome. Silent cortisol hypersecretion is frequently observed in patients with adrenal incidentalomas. Chronic mild cortisol excess may have important systemic effects on the body. Diabetes Mellitus, Hypertension and Obesity could be the clinical effect of cortisol hypersecretion. Also there is increased cardiovascular risk profile in these patients.

Materials and methods
59 year old male, non-smoker non-alcoholic, known case of Diabetes Mellitus for 1 year on T. Glipizide and T. Metformin and Hypertension for 4 years with BMI 29 presented with complaints of facial puffiness and pedal edema for past 2 months and H/O headache on and off for past 1 year. There was no history of abdominal pain, fever, dysuria, . No history suggestive of hyperthyroidism or hypothyroidism. Patient was on Telma 80mg OD and Carvedilol 25mg BD with poor control of Systolic pressure with BP 210/150mmHg. O/E all systems were found to be normal. Chest X-ray showed normal study. ECG showed incomplete RBBB, LVH with repolarisation abnormality ?lateral ischemia. Echocardiogram showed hypertrophic cardiomyopathy and mild cardiomegaly. PFT signified mild restrictive ventilatory defect. Routine Ultrasound abdomen revealed heterogenous lesion in left suprarenal gland ? of adrenal origin.

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and investigations were done to rule out primary malignancy and secondaries. Hormonal study was done and following values were noted. Thyroid function test was within normal limits. 

Early morning Plasma cortisol- 29.6mcg/dl, Midnight plasma cortisol – 19.1mcg/dl, Serum ACTH 12pg/ml, Serum aldosterone 23.3ng/dl, urine metanephrines-02mcg/day, urine normetanephrine-250mcg/day, serum sodium-146mEq/l, serum potassium-4.4mcg/dl, RBS-115mg/dl, FBS-115mg/dl, serum triglycerides-238mg/dl, Serum ACTH was normal and ACTH staining in the pituitary gland did not show any pituitary adenoma.

Postoperative I.V steroids was given for a week. Postoperatively Plasma cortisol level is more sensitive for subclinical Cushings syndrome and it was found elevated in this patient. Hypokalemia in this case is due to the mineralocorticoid activity of endogenous cortisol. Thus Diabetes mellitus, hypertension, obesity, elevated lipids and hypokalemia are due to elevated cortisol and it can be said that subclinical Cushings is not actually subclinical. These clinical manifestations could be due to other causes as well making the suspicion of an adrenal tumour difficult.

Increased cortisol is found to be associated with increased cardiovascular abnormalities probably due to metabolic disturbances. In this patient ECG showed changes of incomplete RBBB with repolarisation abnormality and lateral ischemia, and Echo showed HCM changes with normal LV. For a 59 year old male with no previous h/o heart disease, no h/o heart disease in family members, lateral ischemia, and Echo showed HCM changes with incomplete RBBB with repolarisation abnormality and incomplete RBBB, and repolarisation disturbances. In this patient ECG showed changes of incomplete RBBB with repolarisation abnormality and lateral ischemia, and Echo showed HCM changes with normal LV. For a 59 year old male with no previous h/o heart disease, no h/o heart disease in family members, lateral ischemia, and Echo showed HCM changes with incomplete RBBB with repolarisation abnormality and lateral ischemia, and Echo showed HCM changes with normal LV. For a 59 year old male with no previous h/o heart disease, no h/o heart disease in family members, lateral ischemia, and Echo showed HCM changes with normal LV. For a 59 year old male with no previous h/o heart disease, no h/o heart disease in family members, lateral ischemia, and Echo showed HCM changes with normal LV. For a 59 year old male with no previous h/o heart disease, no h/o heart disease in family members, lateral ischemia, and Echo showed HCM changes with normal LV. For a 59 year old male with no previous h/o heart disease, no h/o heart disease in family members, lateral ischemia, and Echo showed HCM changes with normal LV. For a 59 year old male with no previous h/o heart disease, no h/o heart disease in family members, lateral ischemia, and Echo showed HCM changes with normal LV. For a 59 year old male with no previous h/o heart disease, no h/o heart disease in family members, lateral ischemia, and Echo showed HCM changes with normal LV. For a 59 year old male with no previous h/o heart disease, no h/o heart disease in family members, lateral ischemia, and Echo showed HCM changes with normal LV. For a 59 year old male with no previous h/o heart disease, no h/o heart disease in family members, lateral ischemia, and Echo showed HCM changes with normal LV. For a 59 year old male with no previous h/o heart disease, no h/o heart disease in family members, lateral ischemia, and Echo showed HCM changes with normal LV. For a 59 year old male with no previous h/o heart disease, no h/o heart disease in family members, lateral ischemia, and Echo showed HCM changes with normal LV. For a 59 year old male with no previous h/o heart disease, no h/o heart disease in family members, lateral ischemia, and Echo showed HCM changes with normal LV. For a 59 year old male with no previous h/o heart disease, no h/o heart disease in family members, lateral ischemia, and Echo showed HCM changes with normal LV. For a 59 year old male with no previous h/o heart disease, no h/o heart disease in family members, lateral ischemia, and Echo showed HCM changes with normal LV. For a 59 year old male with no previous h/o heart disease, no h/o heart disease in family members, lateral ischemia, and Echo showed HCM changes with normal LV. For a 59 year old male with no previous h/o heart disease, no h/o heart disease in family members, lateral ischemia, and Echo showed HCM changes with normal LV. For a 59 year old male with no previous h/o heart disease, no h/o heart disease in family members, lateral ischemia, and Echo showed HCM changes with normal LV. For a 59 year old male with no previous h/o heart disease, no h/o heart disease in family members, lateral ischemia, and Echo showed HCM changes with normal LV. For a 59 year old male with no previous h/o heart disease, no h/o heart disease in family members, lateral ischemia, and Echo showed HCM changes with normal LV.
Decision on surgery for this patient was made based on the size of the lesion and hormonal status. Open adrenalectomy was preferred for lesions more than 8cm due to chance of malignancy. Biopsy turned out to be a benign lesion. However it is important to fully evaluate any adrenal neoplasm and choice of surgery should be based on the size of the lesion, nature of the lesion in CT scan, hormonal status or rapid increase in growth of the tumour. A 5 cm tumour size is not a strict cut-off and surgery may be justified for smaller tumour if there is a suspicion of malignancy.

Post-operatively patient was evaluated for changes in clinical and biochemical parameters. Clinically, blood pressure dropped by 30mmHg systolic and facial puffiness and pedal edema resolved. Plasma cortisol levels normalized. Serum potassium increased to normal levels. Fasting blood sugar and random blood sugar values decreased post-surgically signifying that it was due to increased endogenous cortisol. Triglyceride levels though dropped continue to be above normal value.

<table>
<thead>
<tr>
<th>Blood pressure</th>
<th>At the time of evaluation</th>
<th>2nd post operative day</th>
<th>20th post operative day</th>
<th>2nd month follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>210/150 mmHg</td>
<td>160/100 mmHg</td>
<td>150/90 mmHg</td>
<td>150/90 mmHg</td>
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<tr>
<td>Midnight plasma cortisol</td>
<td>19.1mcg/dl</td>
<td>4.4mcg/dl</td>
<td>5.1mcg/dl</td>
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</tr>
<tr>
<td>Fasting blood sugar</td>
<td>127 mg/dl</td>
<td>115 mg/dl</td>
<td>89mg/dl</td>
<td></td>
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<tr>
<td>Serum potassium</td>
<td>2.8 mEq/l</td>
<td>4 mEq/l</td>
<td>4mEq/l</td>
<td></td>
</tr>
<tr>
<td>Serum triglycerides</td>
<td>251 mg/dl</td>
<td>238 mg/dl</td>
<td>196mg/dl</td>
<td></td>
</tr>
</tbody>
</table>

Conclusion
Metabolic syndrome in a patient should arouse the suspicion of adrenal incidentaloma with subclinical Cushings syndrome. Missed diagnosis can lead to unresolved hypertension, diabetes and hypertriglyceridemia which inturn cause irreversible cardiovascular damage. Thus imaging of abdomen is a primary investigation in metabolic syndrome. Open Adrenalectomy is preferred for larger lesions i.e >8cm and those suspicious of malignancy. Surgery improves metabolic parameters but end-organ damage is permanent.

Reference