INTRODUCTION

Hyperpigmentation remains a challenge to most of the practicing clinicians as the cause may vary from benign (photosensitivity, drug effect) to very sinister conditions like ectopic ACTH secretion from a malignancy. A standard clinical approach is a thoroughly taken history including duration and rapidity, medication history including Amiodarone, Amitryptiline, Phenothiazines, Busulfan, Clofazimine, Cyclophosphamide, Daunorubicin in addition to a detailed clinical examination and planned investigative approach. We present a middle aged man with hyperpigmentation after cholecystectomy.

CASE REPORT

A 55 yr-old man with Type 2 Diabetes Mellitus (T2 DM) for 20y complained that he had been getting darker over the last three months. He also complained of lethargy, weight loss (12 lb) and inability to carry out his day-to-day activities. He was on Insulin (40 units/day) for five years, but now found good glycaemic control only with Gliclazide (80 mgm/day) and Metformin (1 gm/day). His hypertension was controlled with Losartan and β blockers.

He had undergone laparoscopic cholecystectomy four months back for acute cholecystitis. His postoperative period was rather stormy with septic shock and stay in intensive care with ionotropic support for four days. He recovered well and went home 10 days after operation.

On examination now, he had mucocutaneous pigmentation (Fig. 1) with a 10 mm postural drop in blood pressure (from 120/80 to 110/70). Systemic examination was unremarkable. Investigations revealed a normal blood count with hyponatraemia (serum Sodium 125 (normal 135-145 mmol/L)) and normal serum potassium 4.8 (normal 3.5-5.5 mmol/L). His renal function, liver profiles were satisfactory as was the glycaemic control (HbA1C 6.8%).

Combination of mucocutaneous pigmentation, postural drop of blood pressure and decreasing insulin requirements with lethargy, weight loss and hyponatraemia clinically point towards adrenal insufficiency. Increase in serum Potassium is expected, but is not a must. With a diagnosis of primary hypocortisolism a short synacthen test was done, which showed a suboptimal response of Cortisol to injected synthetic ACTH, Cortisol increased from 101 to 111 nmol/L only. His ACTH was 157 pg/ml (normal 5-45).

CT scan abdomen showed bilateral enlarged adrenals with hemorrhage (Arrow in Fig. 2) (CT scan taken prior to the surgery as part of the work up for pain abdomen, showed normal adrenal glands). He was started on Hydrocortisone 40 mg a day in divided doses, later decreased to 20 (10-5-5-0). He had a remarkable symptomatic improvement in his sense of well-being and daily activities. He gained eight pounds and his mucosal pigmentation virtually disappeared in next three months. His serum Sodium normalized and Potassium remained normal. His BP is controlled with his antihypertensive medications and he was restarted on insulin for his diabetes. Patients with primary adrenal insufficiency are expected to require mineralocorticoid.

Abstract

We report a patient who complained of becoming darker after an abdominal surgery. The index patient not only had a darker complexion after cholecystectomy, but his glycaemic control was also getting better after operation to the extent that he could stop insulin, which he had been taking for five years. Also, he had lost significant weight after operation. Later, we found that he had developed primary hypocortisolism due to unrecognized bilateral adrenal haemorrhage in the immediate postoperative period. ©
replacement but this also depends on the degree of adrenal insufficiency. Our patient is currently maintaining good quality of life and normal serum Potassium without it.

**DISCUSSION**

The common causes of decreasing anti-diabetic medications in a patient who was controlled on a stable dose are: liver dysfunction, development of diabetic nephropathy, hypothyroidism and hypocortisolism. Combination of a decrease in requirement of diabetic medicines along with weight loss, pigmentation in the setting of septic shock made us consider acute adrenal haemorrhage which had passed silently unnoticed in the post-operative period. Patients with adrenal failure are expected to have hypotension but it may not be a presenting feature. In our case BP was maintained with the same dose of antihypertensive medication. In the Mayo clinic series of 141 cases, hypotension (systolic BP <90 mm Hg) was present only in 14% of the patients.1

The transition of adrenal artery to capillary plexus is very abrupt and constitutes a “vascular dam” which predispose the gland for acute hemorrhage in the event of stress, hypotension and coagulopathy.1,2 Acute Adrenal Hemorrhage (AAH) is an underrecognized consequence of severe illness encountered in the intensive care unit.2,3 AAH was originally described with meningococcal septicemia but now we know it can be associated with any severe illness. AAH has been described with antiphospholipid antibody syndrome, heparin associated thrombocytopenia and after coronary artery bypass grafting.4 AAH has a clinical consequence only if accompanied by hypocortisolism.

A standard screening tests include basal Cortisol (8am) and Synacthen test. A basal Cortisol above 400 nmol/L almost rules out significant adrenal insufficiency while below 200 nmol/L suggests. Values between 200-400 nmol/L need further confirmation. In Synacthen test we inject synthetic ACTH to stimulate the adrenal gland and measure serum cortisol before and 30min after injection. In normal subject, stimulated cortisol is more than 550 nmol/L or cortisol rises by 200 above the baseline.1 Insulin tolerance test constitutes the gold standard diagnostic test. Insulin induced hypoglycaemia is a powerful stimulus for the secretion of cortisol. The test is done with 0.1 unit/kg of regular insulin given intravenously and measuring sugar and cortisol every half an hour for the next two hours. The blood glucose level must fall below 45 mg/dl to ensure adequate stimulation for interpretation of the test. The normal response is a plasma cortisol of greater than 550 nmol/l at any time during the test.

The treatment of adrenal insufficiency consists of replacing the deficient hormones. Many glucocorticoid preparations are available, the best suited is Hydrocortisone in divided doses (20 to 35 mg/day). Our standard practice is to give 10 mg on awakening, 5 mg at noon and 5 mg in the evening. Assessment of adequacy of replacement is not without controversy. While most are happy with improvement of quality of living, abolition of postural hypotension and maintaining normal serum electrolytes others advocate cortisol day curve. We only get the day profile (pre, one and four hour after dose – making a total of 7-8 samples of serum cortisol in 24 hours) in difficult cases to document serum cortisol level with replacement therapy. The glucocorticoid dose has to be doubled in the presence of minor stresses like febrile illnesses or dental work (10-5-5-0 to 20-10-10-0 mg). For major surgeries the steroid dose has to be increased preoperatively preferably on the day of surgery to 100 mg thrice daily intramuscularly and then to gradually taper the dose and bring it to the usual requirement. We start fludrocortisone when with a standard dose of hydrocortisone serum potassium levels start rising. Fludrocortisone is given as a single daily dose of 50 to 200 mcg/day orally. Patients on Fludrocortisone should be monitored for hypertension and oedema. People with congestive cardiac failure can find it difficult to tolerate fludrocortisone.

The potential for recovery of adrenal function following AAH is not great.1 Given the implications of lifelong corticosteroid therapy, a morning cortisol level can be of help (before the morning dose of hydrocortisone) three to six months after commencement of maintenance therapy to see recovery of adrenal function.

**FINAL DIAGNOSIS**

Bilateral adrenal haemorrhage following septic shock presenting with adrenal insufficiency

**REFERENCES**

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**Book Review**

**Handbook of Sports Medicine for Children and Adolescents**

Editors
Swati Y Bhave, Dilip R Patel, Donald E Greydanus

Lack of regular physical activity is a major contributing factor for increased obesity in our country. Obese children and adolescents have an increased risk of developing major health problems as adults. Prevention begins in childhood by having a healthy lifestyle. Best method of having good exercise is encouraging them for sports participation which also helps in developing a all round personality. But sometimes parents force children for sports activity beyond their maturity. Sports icons can negatively influence the diet of children by endorsing unhealthy products. This handbook is useful to Physicians dealing with children and adolescents need to update themselves in various aspects of sports medicine including diet nutrition and physical fitness and psychology.

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