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ADRENAL INSUFFICIENCY

by

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Adrenal insufficiency is a relatively rare disorder. It results when the level of adrenal steroids fall below the level required for the maintenance of normal health, both under basal and stress conditions. Five cases of adrenal insufficiency, seen in the last five years, are described.

CASE HISTORIES

CASE I

A 44 year old man was admitted for investigation of generalised weakness and hyperpigmentation of nine months duration. Six months before admission he was said to have had low blood pressure. For some months before admission he developed occasional headaches, dizziness, abdominal pain and loose stools at times blood stained.

There was no significant past history other than heavy alcohol intake until 12 months previously.

On examination the general condition was good. The BP was 110/80 with no postural drop, pulse 96/min regular and the heart sounds were normal. The chest and abdomen were normal. There was hyperpigmentation of the skin over the forehead, pinna of the ears, both hands, dorsum of the feet and the oral mucous membranes.

The haemoglobin was 11.3G/100ml, WBC 10600/cmm, neutrophils 60%, lymphocytes 30%, eosinophils 10%, ESR 40mm/Hr and platelet count 200,000/cmm. The blood urea was 56mg/100ml, serum sodium 132mEg/L, potassium 5ml Eq/L, serum cholesterol 267mg/100ml, serum uric acid 6.6mg/100ml and serum creatinine 2.0mg/100ml. The glucose tolerance test, liver function, thyroid function, stool examinations, urinalysis, ECG, xrays of the chest, skull and abdomen, barium meal and enema examinations were all normal. Serum cortisol level was low (0.06 u mol/L) and short synacthen test showd a flat curve.

Prednisone was prescribed, 5mg mane and 2.5mg in the evening. He increased his salt intake, took some herbal medicine, felt better and stopped prednisone. Repeated attempts are requesting him to take prednisone were unsuccessful. Three months later he died at home during a febrile illness, presumably due to acute adrenal insufficiency.

CASE II

A 55 year old male was admitted with a 10 year history of mild intermittent headache, nausea, vomiting and dizziness. Twenty five years previously he was treated for pulmonary tuberculosis.

On admission he was vomiting, had headache and felt lethargic. The BP was 100/70 with slight postural drop to 80/30, pulse 70/min regular and the heart sounds were normal. He was dehydrated. There was some increase in skin pigmentation as well as in the oral mucous membranes.

The haemoglobin was 14.0G/100mls, WBC 3900/cmm, neutrophils 24% lymphocytes 60%, eosinophils 7%, monocytes 9%, platelet count 280,000/cmm; blood urea 45mg/100ml, serum sodium 120mEq/L, serum potassium 6.4mEq/L, serum cholesterol 277mg/1000ml, serum creatinine 1.2mg/100ml, blood sugar 74mg/100ml and serum uric acid 6.1mg/100ml. The chest xray showed old bilateral apical tuberculosis and a small calcification was seen in the right parietal region on skull xray. There was no adrenal calcification. The spinal fluid was normal.

He was treated with hypertonic saline, antiemetics corticosteroids and antituberculous drugs (streptomycin and isonizid). The ECG and

barium meal and follow through examinations were normal. His condition improved. Later assessment showed low plasma cortisol level and there was no increase following synacthen.

On regular prednisone (5mg mane and 2.5mg in the evenings), isonizid 300mg daily and increased salt intake, he remains well and asymptomatic.

CASE III

This 55 year old woman was first admitted in 1977 with one month history of generalized weakness, headache and nausea. She had menorrhagia and increasing pigmentation of her hands and oral mucous memberanes. The BP on admission was 100/60 with a postural drop to 80/60. The morning plasma cortisol was low (0.07 u mol/1, normal range 0.4 - 7.0 u mol/L) and after synacthen stimulation no increase occured. The haemoglobin was 13.0G/100mls, WBC 12840/cmm, neutrophils 77%, lymphocytes 14% eosinophils 4%, monocytes 5%, blood urea 102mg/100ml, serum sodium 138mEq/L, potassium 3.9mEq/L, serum cholesterol 184mg/100mls. The chest xray urinalysis, spinal fluid, and ECG were normal. No acid fast bacilli were seen in sputum or gastric washing and there was no adrenal calcification, but the tuberculin test was positive.

She was transferred to a chest hospital where she was treated as for tuberculosis for 12 months with ethambutol and isoniazid and prednisone on long term basis. She was admitted three years later with generalized weakness, nausea, vomiting, headache, muscle pains, increasing pigmentation and hypertension. She responded well to corticosteroids and was discharged on prednisone., 10mg daily and increased salt intake. She remains well and asymptomatic on prednisone 10mg daily and increased salt intake.

CASE IV

This 60 year old female presented in 1976 with left sided abdominal mass, which on investigation was found to be retroperitoneal tumour. The tumour was removed and the histology showed it to be a phaeochromocytoma. She remained well for the next five years when she again presented with weakness and right sided abdominal mass. There was no history of headaches, palpitations, flusing, diarrhoea or hypertension. Histologically the right sided tumour was also shown to be pheochromocytoma.

Two weeks post operative she experienced increasing weakness and tiredness. She became hypotensive and increased pigmentation of her hands and palate was noted. The response to steroids was dramatic. She was discharged on maintenance prednisone.

Three months later she developed narrow angle glaucoma in the left eye and acute adrenal insufficiency with hypokalaemia, hyponatremia, hypotension and vomiting. The response to steroids was dramatic. She remains well on prednisone 10mg daily and fluodrocortisone 0.2mg daily.

CASE V

This 35 year old male developed severe rhuematoid arthritis at the age of 31 years. His arthritic symptoms were controlled on analgesics and prednisone 10mg daily. He was admitted with a three week's history of cough, night sweats, fever, and weight loss. His chest xray showed an opacity at the right apex and his mantoux was strongly positive. Tubercle bacilli were seen in his sputum. He was transferred to a chest hospital, where he was receiving antituberculous drugs, initially as an inpatient and later on domicillary basis.

He was admitted six months later with a septicaemic illness and inspite of treatment with corticosteroids and antibiotics, he died 36 hours after admission. Autopsy showed bilateral adrenal atrophy, pulmonary tuberculosis congested liver, glomerulonephritis and multiple small ulcers in the small intestine.

Adrenocortical insufficiency is due either to the disease primarily of adrenal glands or secondary atrophy of the gland from pituitary diseases or high doses steroids. The common causes of primary adrenal failure are autoimmune adrenalities, tuberculosis and bilateral adrenalectomy for malignant disease.[1] Rare causes include granulomatous diseases, glandular destruction due to secondary deposits, haemochromatosis, fungal diseases and metabolic failure of hormone production. In the past tuberculosis was the most common cause accounting for 68 - 90% of all cases of Addison's disease[2 3] and still remains more common than other causes in developing countries.[1] In developed countries where tuberculosis is not so common, idiopathic atrophy presumably on autoimmune basis accounts for majority of cases. In this series two (cases II and III) out of three (Case I - III) cases of Addison's disease had tuberculosis.

The clinical features of primary adrenal insufficiency do not become manifest until about 90% of the gland is destroyed.[3] Thomas Addison of Guy's Hospital, London, in 1855 gave a vivid description of the disease which came to be known as Addison's disease in a paper titled "On the Constitutional and Local Effects of Diseases of the Suprarenal Capsule". He wrote[4] "The patient in most of the cases I have seen, has been observed gradually to fall off in general health; he becomes languid and weak, indisposed to either bodily or mental exhaustion; the appetite is impaired or entirely lost;.....the pulse small and feeble.....excessively soft and compressible; the body wastes...slight pain or uneasiness is from time to time referred to the region of the stomach, and there is occasionally actual vomiting.....it is by no means uncommon for the patient to manifest indications of disturbed cerebral circulation.....We discover a most remarkable, and as far as I know characteristic discolouration taking place in the skin — sufficiently marked indeed as generally to have attracted the attention of the patient himself, of the patient's friends. It may be said to present a dingy or smoky appearance, or various tints or shades of deep amber or chestnut-brown. The body wastes.....the pulse becomes smaller and weaker and.....the patient at length gradually sinks and expires."

As described by Addison, the common clinical features are pigmentation, weakness, anorexia, nausea, vomiting, weight loss, dizziness and postural hypotension[1 2 3 4 5]. Loss of body hair is frequent in females. Other features include abdominal pain, dyspepsia, nocturia, depression, vitiligo, diarrhoea, hypoglycaemic impotence amenorrhoea and salt-craving.

In mild cases symptoms tend to be nonspecific causing difficulties in the diagnosis. Pigmentation, a common feature of the disease, tends to occur in exposed and pressure areas, recent scars, areas normally pigmented and buccal mucousa, is often difficult to detect unless marked in darkskinned people. Presence of vitiligo should make one suspect the disease. Hyponatremia, hyoerkalaemia, raised urea, hypoglycaemia and eosinophilia, when present are helpful in the diagnosis, the confirmation of which requires the demonstration of decreased cortisol production both under basal and stress states. Short tetracosactrin (Synacthen) test is most frequently performed and if results are unequivocal Depot synacthen test used to be done.

In Addison's disease there is deficiency of both the glucocorticoids and mineralocorticoids and both need to be replaced. The treatment is life long. Glucocorticoids such as cortisol or prednisone have weak mineral-retaining properties and when combined with increased salt intake may relieve all the symptoms in some cases as in two of our cases but is better to prescribe fludrocortisone in all cases. It is possible that the fourth patient would have been better with fludrocortosone from the beginning. Fludrocortisone is a less readily available and used drug. The maintenance therapy should relieve all the symptoms in Addison's disease. The treatment should be closely monitored to avoid under or overdosage. In addition steroid doses must be increased during infection, surgery, even minor as well as during pregnancy when there is vomiting or toxaemia.

SUMMARY

Five patients wiht adreno-cortical insufficiency are described. Three had Addison's disease of which two were due to tuberculosis, one had bilateral adrenalectomy for phaeochromocytoma and the fifth patient had adrenal atrophy due to steroid therapy.

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