ISSN: 0975-833X

Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 7, Issue, 02, pp.12529-12531, February, 2015

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

CASE REPORT

A CASE OF ADRENAL INSUFFICIENCY PRESENTED WITH ACUTE ABDOMEN AND HYPOGLYCAEMIA

***Dr. Md. Hamid Ali, Dr. Kapildev Mondal and Dr. Arijit Sinha**

Department of General Medicine, Murshidabad Medical College and Hospital, India

ARTICLE INFO

Article History:
Received 23rd December, 2014
Received in revised form
26th January, 2015
Accepted 29th January, 2015
Published online 26th February, 2015

Key words:

Hypoglycaemia,
Addison's disease,
Adrenal insufficiency.

ABSTRACT

Addison's disease usually presents with non-specific symptoms like fatigue, nausea, vomiting, hyper-pigmentation and generalized weakness. These symptoms are most often ignored or misinterpreted with other more common diseases (Depression, Somatoform disorder). This is the major reason that this disease is under-diagnosed. Therefore, to establish a diagnosis, high index of suspicion is needed. We are reporting a case of 30 years old female who presented with recurrent episode of acute abdomen and severe hypoglycaemia. Careful history (long lasting fatigue, weakness, lack of energy, nausea, anorexia, weight loss, hyper-pigmentation etc.) and careful interpretation of laboratory value (Hyponatremia, Hyperkalemia, hypoglycaemia, anaemia, hypercalcemia, neutropenia, eosinophilia, normal lipase etc.) will dictate the diagnosis of adrenal insufficiency. After that only confirmatory ACTH stimulation test (Synacthen) to be done.

INTRODUCTION

Addison's disease refers to primary adrenal insufficiency (AI) caused by a total or near total destruction or dysfunction of both adrenal cortices (**Fitzgeral, 2006 and Sid haye, 2004**). Deficiency of ACTH can also produce adrenal insufficiency (AI) but this is known as secondary adrenal insufficiency (AI). Adrenal glands are the part of the endocrine system and present over the kidneys. The adrenal glands consist of two parts, the cortex (outer section) and the medulla (inner section). The cortex is responsible for producing three hormones which are glucocorticoids, mineral corticoids and sex hormones. In Addison's disease, destruction occurs in the cortex region and due to this damage, the cortex starts producing fewer amounts of hormones. Cortisol and aldosterone are two such stress hormones which are produced by the adrenal glands in response to stress. Cortisol is a glucocorticoid hormone which helps in balancing glucose level and assists the body to respond toward stress. When unsatisfactory amount of these hormones are produced by adrenal gland (cortex), this may lead to Addison's disease. Sign and symptoms of Addison's disease: The signs and symptoms of Addison's disease may include: Muscular tiredness and dizziness, decreased blood sugar level, Pain in muscles and joints, Depression and Irritability, Hair loss from the body, Nausea and vomiting, Kidney failure, Pigmentation on skin, Mouth lesions (Table 1). Addison's disease is an endocrine disorder that occurs in about, 1 in 1,00,000 people. It occurs in all age groups and afflicts men and women equally. 3 Causes of Addison's disease: The two most common causes of Addison's disease are autoimmune adrenalitis and tuberculosis. Other causes include tumour of glands, invasion by neoplastic cells, Infections such as -CMV virus, HIV, Infiltration- such as haemochromatosis, amyloidosis, haemorrhage (anticoagulant, APLA syndrome, Water House Frederickson syndrome due to meningococcal septicaemia) and surgical removal of glands (www.nhsdirect.nhs.uk and www.mayoclinic.com). Risk factors in Addison's disease: There are some risk factors that increase the probability of Addison's disease. The combination of autoimmune disorder and Addison's disease is described as polyglandular autoimmune disorders, type I (PGA I) and type II (PGA II). In PGA I, there is associated hypothyroidism and mucocutaneous candidasis and in PGA II there are hypo-or hyper-thyroidism, type I diabetes mellitus, primary ovarian or testicular failure and pernicious anemia (**Fitzgeral, 2006 and www.nhsdirect.nhs.uk**).

Acute adrenal insufficiency usually occurs after a prolonged period of nonspecific complaints and is more frequently observed in patients with primary adrenal insufficiency, due to the loss of both gluco corticoid and mineralo corticoid secretion. Postural hypotension may progress to hypovolemic shock. Adrenal insufficiency may mimic features of acute abdomen with abdominal tenderness, nausea, vomiting, and fever. In some cases, the primary presentation may resemble

****Corresponding author: Dr. Md. Hamid Ali,***
Department of General Medicine, Murshidabad Medical College and Hospital, India

neurologic disease, with decreased responsiveness, progressing to stupor and coma. An adrenal crisis can be triggered by an intercurrent illness, surgical or other stress, or increased glucocorticoid inactivation (e.g., hyperthyroidism).

Table 1. Signs and Symptoms of Adrenal Insufficiency

Signs and Symptoms Caused by Glucocorticoid Deficiency
Fatigue, lack of energy
Weight loss, anorexia
Myalgia, joint pain
Fever
Anaemia, lymphocytosis, eosinophilia
Slightly increased TSH (due to loss of feedback inhibition of TSH release)
Hypoglycaemia (more frequent in children)
Low blood pressure, postural hypotension
Hyponatremia (due to loss of feedback inhibition of AVP release)
Signs and Symptoms Caused by Mineralocorticoid Deficiency (Primary AI Only)
Abdominal pain, nausea, vomiting
Dizziness, postural hypotension
Salt craving
Low blood pressure, postural hypotension
Increased serum creatinine (due to volume depletion)
Hyponatremia
Hyperkalemia
Signs and Symptoms Caused by Adrenal Androgen Deficiency
Lack of energy
Dry and itchy skin (in women)
Loss of libido (in women)
Loss of axillary and pubic hair (in women)
Other Signs and Symptoms
Hyper pigmentation (primary AI only) [due to excess of pro-opiomelanocortin (POMC)–derived peptides]
Pale skin (secondary AI only) (due to deficiency of POMC-derived peptides)

Diagnosis

The diagnosis of adrenal insufficiency is established by the short cosyntropin test, The cut-off for failure is usually defined at cortisol levels of <500–550 nmol/L (18–20 g/dL) sampled 30–60 minutes after ACTH stimulation Random serum cortisol measurements are of limited diagnostic value, as baseline cortisol levels may be coincidentally low due to the physiologic diurnal rhythm of cortisol secretion. Similarly, many patients with secondary adrenal insufficiency have relatively normal baseline cortisol levels but fail to mount an appropriate cortisol response to ACTH, which can only be revealed by stimulation testing. Importantly, tests to establish the diagnosis of adrenal insufficiency should never delay treatment. Thus, in a patient with suspected adrenal crisis, it is reasonable to draw baseline cortisol levels, provide replacement therapy, and defer formal stimulation testing until a later time.

Once adrenal insufficiency is confirmed, measurement of plasma ACTH is the next step, with increased or inappropriately low levels defining primary and secondary origin of disease, respectively. In primary adrenal insufficiency, increased plasma renin will confirm the presence of mineralo corticoid deficiency. At initial presentation, patients with primary adrenal insufficiency should undergo screening for steroid auto antibodies as a marker of autoimmune adrenalitis. If these tests are negative, adrenal imaging by CT is indicated to investigate possible haemorrhage, infiltration, or masses. Chest X-Ray to exclude PTB, 17 HO Progesterone to exclude CAH is also done in patients with negative auto antibodies. In male patients with negative auto antibodies in the plasma, very long chain fatty acid (VLCFA) should be measured to exclude X-ALD (Adrenoleucodystrophy). Patients with inappropriately low ACTH, in the presence of confirmed cortisol deficiency, should undergo hypothalamic-pituitary imaging by MRI. Features suggestive of preceding pituitary apoplexy such as sudden-onset severe headache, or history of previous head trauma, should be carefully explored, particularly in patients with no obvious MRI lesion (Consider isolated ACTH deficiency in this case).

Chronic adrenal insufficiency

The symptoms of adrenal insufficiency usually develop gradually with relatively nonspecific signs and symptoms chronic fatigue, muscle weakness, loss of appetite, nausea, vomiting, and diarrhoea often resulting in delayed or missed diagnoses (e.g., as depression or anorexia). In about 50% of cases, blood pressure is low and falls further in erect posture, causing dizziness or fainting. Skin changes are also common with the areas of hyper-pigmentation, more on exposed parts of the body. Addison's disease can cause irritability and depression because of salt depletion, resulting in craving for salty foods. In women, menstrual periods become irregular or stop altogether; loss of pubic and axillaries hair may also occur (**Fitzgeral, 2006 and Greenspan, 1997**). A distinguishing feature of primary adrenal insufficiency is hyper-pigmentation, which is caused by excess ACTH stimulation of melanocytes. Conversely, in secondary adrenal insufficiency, the skin has paleness due to lack of ACTH secretion. Hyponatremia is a characteristic biochemical feature in primary adrenal insufficiency and is found in 80% of patients at presentation. Hyperkalemia is present in 40% of patients at initial diagnosis. Hyponatremia is primarily caused by mineralo-corticoid deficiency but can also occur in secondary adrenal insufficiency due to diminished inhibition of ADH by cortisol, resulting in mild syndrome of inappropriate secretion of antidiuretic hormone (SIADH). Glucocorticoid deficiency also results in slightly increased TSH concentrations that normalize within days to weeks after initiation of glucocorticoid replacement.

Case Report

A 30 years old lady was brought ED with the complaints of recurrent episodes of vomiting and generalized weakness for one year. There was history of weight loss of approximately 6kg in one year. Generalized weakness was so severe that it resulted in difficulty in walking for which he was being bedridden for last 2 months. There was no history of tuberculosis or any other major illnesses in his family. On examination the lad was looking ill and lethargic. She had short stature with lean body habitus. There was significant postural drop from 90/60 mmHg in lying position to 70/50mmHg in standing posture. She was anemic and dehydrated. There were also areas of hyper-pigmentation in the buccal mucosa, gums, and on palmer creases. Her weight was 50 kg. For these complaints patient visited different family physicians and was admitted three times in private hospitals.

Her minimum blood sugar recorded during these hypoglycemic episodes was 40mg/dl on one occasion, when he was brought to a private hospital in stuporous condition. Her blood sugar was first measured by glucometer and then confirmed by laboratory. When she was referred to MSDMCH, her Hb was 11.5g/dl, showing normocytic normochromic picture. Fasting blood sugar was 65 mg/dl, serum sodium 130mEq/L and potassium 4.8mEq/L. X-Ray chest revealed prominent bilateral hila with calcification mainly on right side and microcardia. Her ultra-sonography and CT scan of abdomen were normal. No calcification or any other abnormality was seen in adrenal glands. Mantoux test was negative. Fasting serum insulin was less than 1.0 micro unit already advised by a general physician suspecting insulinoma because of recurrent episodes of hypoglycaemia. Considering the clinical diagnosis of Addison's disease, Short Synacthen test was performed with 250µgm of ACTH and result showed serum cortisol baseline of 1.2µg/dl, after 30 minutes it was 2.0µg/dl and after 60 minutes it was less than 1.1µg/dl, thus confirming the diagnosis of Addison's disease. Anti microsomal and antithyroglobulin antibodies were negative and thyroid function tests were normal. The patient was diagnosed as a case of Addison's disease. After extensive workup no definite aetiology could be detected in this patient. He was treated with Tab. Hydrocortisone 10mg, two tablets in the morning and one tablet in the evening, this dose was tapered off after three days. Tab. Fludrocortisone was given in a dose of 50mcg / day, with this drug therapy, after 6 weeks patient gained 5kg weight. Severity of hyper pigmentation is reduced. She is looking healthy and cheerful, and at present he is on a maintenance dose of 5mg in the morning and 2.5mg in the evening.

Table 12. Laboratory investigation results

Laboratory variable Serum level	ESR-50mm/hr
Na+ -136 mmo/L	Urea 2.8 mmo/L
K+-3.4 mmo/L	Creatinine 17.7 Umol/L
Cl- 100 mmo/L	Corticotrophin 110 pg permilliliter
HCO3- 22 mmo/L	Total bilirubin- 1.7 mg/dl
Hb-9gm/dl	AST 47U/L
ALT 37U/L	Total protein 7.8g/L
Albumin 3.4g/L	Fasting blood sugar 40mg/dl/L
Packed cell volume 30%	White blood count 5,800/mm3
Neutrophil 33	Lymphocyte 61
Eosinophil 6	Platelets Adequate and Normal

DISCUSSION

A medical history of the symptoms is often sufficient to raise a suspicion of Addison's disease. Quite often the first clue is from the abnormal laboratory tests, like hyponatremia, hyperkalemia, hypoglycemia, eosinophilia, neutropenia and hypercalcemia (**Fitzgeral, 2006 and Sid haye, 2004**). The most specific test for diagnosis is ACTH stimulation (Synacthen) test. The patients with adrenal insufficiency responds poorly or do not respond at all. Sometimes a long ACTH stimulation test is required to determine the secondary cause of adrenal insufficiency (**www.nhsdirect.nhs.uk and Besser, 1982**). Since all of the manifestations of Addison's disease are caused by the lack of cortisol and aldosterone, the treatment is to replace these with similar steroids. Cortisol is replaced orally by hydrocortisone tablets and aldosterone is replaced by an aldosterone like synthetic steroid, fludrocortisone (Florine) tablets. The doses of each of these medications are adjusted according to the individual's response and any co-existing medical condition. Response may be seen clinically by observing blood pressure, postural drop, reduction in the hyper-pigmentation and bio-chemically may be seen by improvement in the imbalance of the serum electrolytes, blood sugar and serum rennin-aldosterone. In emergencies or during surgery, hydrocortisone must be given intravenously (**www.nhsdirect.nhs.uk and Liotta, 2005**). Patients with Addison's disease should be taught to treat minor illnesses with extra salt and fluids. A person who has adrenal insufficiency should always carry identification card, stating his or her condition, with full address & contact numbers. As long as the proper dose of replacement medication is taken every day, an Addisonian can have a normal crisis-free life (**Chrouisos, 2004**).

Conclusion

The patient of adrenal insufficiency can present with acute abdomen with nausea, vomiting, hypotension those point to surgical causes. Careful history (long lasting fatigue, weakness, lack of energy, nausea, anorexia, weight loss, hyper-pigmentation etc.) and careful interpretation of laboratory value (Hyponatremia, Hyperkalemia, hypoglycaemia, anaemia, hypercalcemia, neutropenia, eosinophilia, normal lipase etc.) and normal USG will dictate the diagnosis of adrenal insufficiency. After that only confirmatory ACTH stimulation test (Synacthen) to be done.

REFERENCES

Besser, GM., 1982. 'Adrenal Cortex', Fundamental of Clinical Endocrinology (fourth edition) Churchill Livingstone, Edinburgh London, pp: 171-72.

Chrouisos, GP. 2004. 'Information of endocrine and metabolic diseases'. NIH publications, (www.endocrine.niddk.nih); pp. 04-3054, 6:

Fitzgeral AP. 2006. Chronic adrenocortical insufficiency', Endocrinology. In: Current medical diagnosis and treatment 2006 (45th editions), Lange Medical books / Mc Graw Hill, Medical Publishing division. New York. pp. 1174-76.

Funder, JW. *et al*. 2008. Case detection, diagnosis, and treatment of patients with primary aldosteronism: An Endocrine Society Clinical Practice Guideline. *J. Clin Endocrinol Metab.,* 93:3266, [PMID: 18552288] [Full Text]

Greenspan, FS. 1997. 'Diseases of Adrenocortical Insufficiency'. 'Basic and Clinical Endocrinology (fifth edition), Appleton and Lange. Resident Medical Prentice Hall International, pp:337.

Liotta, AE. 2005. Department of Dermatology, Uniformed Services University UK, 'Addison's Disease', (www.emedicine.com), Topic no; 761,12.

Mayo's Clinical staff, 'Addison's Diseases Overview', (www.mayoclinic.com), Reg.no. DS00361, 6:2006.

NHS encyclopedia. Addison's diseases, articles no 7, (www.nhsdirect.nhs.uk) section 2006. 13589:4

Sid haye, RA. 2004. 'Addison's disease'. Medline pulse encyclopedia, (www.medlineplus.gov), Article no 000378, 6.

****