Addison Disease in a Young Child: A Case Report

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Abstract

Background: Addison disease is disorder of primary adrenocortical insufficiency that results from dysfunction or destruction of the adrenal gland. Clinical manifestations are usually non-specific and subtle leading to delay in diagnosis and associated high mortality and morbidity. The objective of this case report is to describe an acute emergency presentation of a 6 years old child of Addison's disease. As the differential diagnoses of such presentation may not initially include Addison's disease, this case report is expected to create necessary awareness among the treating physicians.

Case Presentation: We report a case of Addison Disease in a 6 years old boy who presented atypically with fever and CNS manifestations. Careful physical examination revealed blackening hyperpigmentation of the skin of the child who had circulatory collapse as well. Clinical suspicion of Addison disease raised and we investigated promptly, started specific treatment soon and the boy was saved. We could aware the parents about the life-long precaution to be undertaken for their child. We do emphasize on careful history taking, thorough physical examination and focused laboratory investigations to avoid missed or delayed diagnosis of this uncommon but fatal endocrine disorder.

Conclusion: High index of clinical suspicion is needed to diagnose Addison disease with unusual presentation specially in children. Often the condition may be mimicked to other closely related differentials that the physicians should be aware of.

Key words: Addison disease; Primary adrenocortical insufficiency; Young child.

Introduction

Addison Diseases (AD) is a chronic endocrine disorder resulting from primary adrenal insufficiency. Thomas Addison first described the clinical features of adrenal insufficiency in 1855 as a syndrome of weakness, fatigue and hyper pigmentation associated with adrenal gland failure.[1] It is a rare disease that affects 1 in 100,000 of adult population but the incidence of this condition in pediatric age group is not known.[2] In developing countries, due to limited facilities for special investigations, Addison disease remain undetected in the early part of their presentation. Low prevalence and atypical presentations often make the clinicians unaware of this endocrine disorder. Females are affected two to three times more than males and onset most often occurs between the age of 30 to 40 years, also it can occur at any age. The two most common causes of Addison disease are tuberculosis and autoimmune adrenalitis. Other causes include surgical removal, hemorrhage, metastatic invasion, infections like cytomegalovirus, parasitic and fungal and amyloidosis. In some cases, autoimmune AD can be associated with other autoimmune disorders described as Autoimmune Polyendocrine Syndrome (APS) type1 or 2 or 4 or can be isolated.[3,4]

Case Presentation

A six years old male child, first issue of consanguineous parents presented on 10th January 2023 at Pediatrics ward, Chittagong Medical College Hospital (CMCH) Chattogram with fever, vomiting and convulsion for several times followed by unconsciousness for two hours. He had low grade, intermittent fever for last two days which was not documented. Fever was associated with vomiting for two times and generalized tonic clonic convulsions occurred repeatedly for several times followed by loss of consciousness. He neither gave history of headache, weakness, lethargy, dizziness or vertigo nor had history of head injury, weight loss, cough, diarrhoea, otorrhea, jaundice or any urinary complaints. There were no recent drug history or history of contact with tuberculosis patient.

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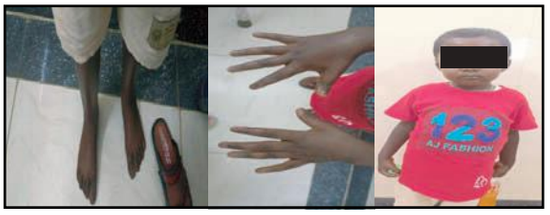

Figure 1 Idopathic autommune Addison disease

On examination, he was unconscious, comatose (GCS 5/15), pulse was 132/min, low volume, BP was 60/30 mm of Hg (<5th centile), temperature was 100°F, R/R-38/min. His CBG was found 2.4 mmol/l, his height was 108 cm (On 10th centile), weight was 16kg (On 3rd centile) and BMI was 14kg/m^2 (on 10th centile). All deep tendon reflexes of both upper and lower limbs were normal, plantar reflexes were also found bilaterally flexor. The boy was mildly anemic having no lymphadenopathy, BCG scar mark was present and signs of meningeal irritation were absent. Generalized hyperpigmentation of the skin was noted as blackening of face, neck, joints, oral mucosa, feet and nails. His sexual maturity was on tanner stage one. Ophthalmoscopic and other systemic examination (Cardiovascular, respiratory and abdomen) were normal.

His initial investigations were done focusing on his acute presentation of fever, convulsion with unconsciousness. But due to presence of darker complexion compared to other family members with associated hypotension and hypoglycemia, evaluation for addison´s disease was also performed later on. His hemoglobin was found 11.2 g/dl, total leukocyte count was 12600/mm^3, RDT for malaria was negative. Initial serum electrolyte showed normal K and lower normal Na (133 mmol/L) levels. No features of hyperkalemia were observed in ECG tracing. Serum Calcium was 7.2g/dl, Serum albumin was 3.05g/dl, albumin adjusted total Ca was 8.26mg/dl. Inorganic phosphorus was 2.5mg/dl (Normal 2.5-5.2 mg/dl), serum creatinine was normal. His urine microscopy and biochemical result revealed pus cell 1-3/HPF, RBC 40-45/HPF with uric acid crystal +++ and there was no growth on urine culture. CSF study, X-ray chest, USG of abdomen and CT head were all normal. Normal adrenal gland volume was reported on MRI of abdomen and no calcification was seen on abdominal X-ray. Mantoux test result was negative (7mm). His basal (Morning) cortisol level was 4.10µg/dl (Normal 4.30-22.40 µg/dl) and plasma ACTH was 994.2pg/ml (normal7.2-63.3pg/ml). His TSH level was 2.33 µIU/ml (Normal 0.85-6.5 µIU/ml), FT_4 was 0.745ng/dl (normal 0.80-1.90 ng/dL) and serum PTH was 14.39pg/ml (normal 15-68.3 pg/ml). ANA was found negative. According to the diagnostic criteria, raised morning ACTH of > 100pg/ml, normal adrenal volume with absence of calcification on imaging and presence of hypoparathyroidism as other autoimmune disorder this 6 years old boy was finally diagnosed as a case of idiopathic autoimmune Addison disease.

This patient was initially managed as a case of meningoencephalitis with shock with appropriate fluid including normal saline and 10% DA. Injectable antibiotic, antiviral and anticonvulsant were administered. Later on, injectable Hydrocortisone was added and his blood glucose, blood pressure and consciousness level showed gradual improvement. With such progress all other injectable drugs were withdrawn gradually. His recovery was satisfactory. After confirming his diagnosis as AD, he was discharged on oral hydrocortisone in a dose of 15 mg/m^2/24 hr and advised for regular follow up to check his weight gain, blood pressure, blood glucose and electrolyte level. Parents were counseled in details about the disease course, obligatory drug compliance, emergency complications and regular follow-up. A steroid card was provided for the child to carry with him always. Before presented the case report necessary permission was obtained from the proper authorities.

Discussion

Chronic adrenal insufficiency is a rare condition, often misdiagnosed due to lack of specific sign and symptoms. Delay in diagnosis and treatment can lead to adrenal crisis, a medical emergency, with fatal consequences.[5] The symptoms of adrenal insufficiency may develop insidiously and often vague in nature like weakness, weight loss, chronic fatigue, loss of appetite, nausea, vomiting and diarrhea, body aches, salt craving, syncope, dizziness, and disorientation. Hyper pigmentation and hypotension are important signs though former one is less frequently present. Common laboratory findings like electrolyte imbalances

(Hyponatremia & hyperkalemia), hypoglycemia, ketosis and anaemia are often sufficient to raise a suspicion of Addison disease.[6,7] Uncommon presentations are also responsible for delay in diagnosis in some cases. Intractable hiccough, pseudotumor cerebri, sciatica-like back pain, hyperkalemic periodic paralysis, recurrent hypoglycemic episodes, persistent abnormalities in transaminases, myalgia and muscle contractures, anorexia nervosa and unexplained abdominal symptoms are some such reported presentations of AD.[8-16]

About 50% patients are only diagnosed after an episode of adrenal crisis. During crisis patients may present with deteriorating general condition with severe dehydration, hypotension or shock. Crisis can be triggered by sepsis, and sepsis on the other hand can mask features of adrenal insufficiency making the diagnosis difficult.[17] This reported case presented with fever and repeated convulsions followed by unconsciousness. Presence of hyperpigmentation, hypotension and hypoglycemia were the initial clues for suspecting Addison disease in this case. Absence of hyperkalemia and worsened hyponatremia were most probably due to less pronounced aldosterone deficiency. Basic investigations such as basal morning low cortisol and high ACTH levels strongly supported the diagnosis. Presence of of hypoparathyroidism, most common associated autoimmune disorder in pediatric AD was confirmed by low serum calcium, low normal inorganic phosphorus and raised PTH levels. X-ray and other imaging, though were normal having no evidence of adrenal hypoplasia or calcification, contributed to the final diagnosis according to the diagnostic criteria for autoimmune AD. After starting specific therapy with hydrocortisone, the child showed continued gradual improvement and was discharged accordingly. No mineralocorticoid supplementation was needed. This type of acute emergency clinical presentation of a 6 years old young child residing in high-risk malaria zone focuses to the primary diagnoses of meningitis, encephalitis, severe malaria and others. In this context it is quite unusual to suspect Addison disease initially. So, this case highlights the need for clinician to consider Addison disease with high index of suspicion especially in children presenting with acute febrile illness with shock having hyperpigmentation and hypoglycemia.

Limitation

ACTH stimulation test was not done. Adrenal and other related antibodies could not be assessed.

Conclusion

Addison disease is a difficult diagnosis because of its non-specific symptoms. A delay in diagnosis can lead to life-threatening consequences, so it is important to exclude this disease if the mimicked clinical features raise any kind of suspicion.

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Contribution of authors

SA-Drafting, citing references & final approval

ZC-Conception, design, drafting & final approval

PC-Conception, citing references & final approval

DB-Design, critical revision & final approval

MSA- Conception, citing references & critical revision

SS- Design, critical revision & final approval

Disclosure

All the authors declared no competing interest.

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