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CASE REPORT

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Cushing syndrome with chronic kidney disease: A case report

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Abstract: Cushing Syndrome, a rare condition with increased glucocorticoid production can affect renal function directly by its effect on glomerular and tubular functions or indirectly through the cardiovascular system. The aim is to report a case of Cushing Syndrome complicated by End Stage Renal Failure.
The authors present symptoms, clinical course and laboratory findings of a 16-year-old girl with a diagnosis of Cushing syndrome complicated by end stage renal failure. She presented with excessive weight gain of 7-years, recurrent abdominal pain of 1-year, vomiting of 3-weeks and headache of a day duration. She had moon face, striae, buffalo hump and hypertension.

Keywords: Cushing Syndrome, Renal Failure, Hypertension.

Introduction

Cushing Syndrome is a rare disorder with only 10 % of reported cases seen in children,[1] resulting from abnormally high blood levels of cortisol and other glucocorticoids.[2,3] Glucocorticoids affect renal function by their effect on glomeruli and renal tubules,[4] enhance renin-angiotensin system and vasoactive substances but depress vasodilatory system, this can result in renal failure. Renal failure can alter glucocorticoid metabolism creating diagnostic dilemma in Cushing Syndrome.[5,6]

Case Report

The patient is OM, a 16-year-old girl who was referred from Ahmadu Bello University Medical Centre, Samaru Zaria with history of excessive weight gain for 7 years, recurrent abdominal pain for a year, vomiting for 3-weeks duration and headache for a- day duration.
She was apparently well until 7 years prior to presentation when she was noticed to have started gaining weight excessively, weight gain more around the abdomen and upper part of the body, has no regular records of previous weight, however said to have weighed 90 kg at 13 years of age, weight gain progressively worsened and persisted until presentation.
She was born at term with a birth weight of 4.1kg with no abnormal facie noticed at birth. She was noticed to have been comparatively bigger than her peers while growing up, however this worsened significantly over the past 7 years. Her mother is not a known diabetic and no history of gestational diabetes during her pregnancy. There is maternal family history of obesity and diabetes mellitus.
She does not engage in sports in school and does not exercise at home.
A year prior to presentation, she started having recurrent abdominal pain, pain is worse in the epigastric region, radiates to the back, burning in nature, worse when patient is hungry or after spicy meals and relieved by medications, pain not severe enough to prevent her from going about her regular activities or sleeping, not posture related and has no particular periodicity. Pain lasts 3-5 days, has 1-2 episodes a month which started 3 weeks prior to presentation, pain became severe enough to prevent her from going about her activities and sleeping at nights and persisted in that manner until presentation. Present episode of the abdominal pain was associated with projectile vomiting, vomiting was post-prandial, contained recently ingested meals, non bilous, not blood stained. She had 3-6 bouts of vomiting in a day, estimated volume was 30-60 mls per bout.
No abdominal distension, no change in bowel habits, no jaundice. No reduction in urine frequency of micturition, no pain on micturition, no haematuria, no hesitancy, no feeling of incomplete emptying of the bladder after micturition.

She started having headache a day prior to presentation, headache was throbbing, generalized, non-radiating, severe enough to prevent her from going about her activities, no particular periodicity, no known aggravating or relieving factors, no dizziness, no early morning vomiting. No blurring of vision, no syncope, no neck pain, no neck stiffness, no photophobia. Headache persisted until presentation.
Since onset of recurrent abdominal pain, she has been given medications including antacids and omeprazole capsule from the referring hospital. With worsening

symptoms, a day prior to presentation, she presented to the same hospital where there was an incidental finding of elevated blood pressure which necessitated her referral to this hospital.

Pregnancy, delivery and neonatal histories were not contributory, however, were not adversely eventful. She is fully vaccinated for age.

She is in senior secondary school (SS3) and performance is very good. She is the only child of both parents. Mother is a 50-year- old administrative staff of department of veterinary medicine (faculty secretary) with tertiary education, father is a 55-year- old staff of NAERLS with a master s degree (ABU). Marriage setting is monogamous, non-consanguineous.

On examination: Looks big for age, has moon face, supraclavicular pad of fat and a buffalo hump. Has widespread striae more in the arms, abdomen and thighs, has patchy hyperpigmentation of the skin of the face, neck, forearms and knuckles. Has excess hair growth on the face, forearms, abdomen and the legs.

Weight= 103kg->95th percentile for age and sex.

Height= 162cm- at the 55th percentile for age and sex.

Body mass index= 39.2kg/m^2- grade ll obesity

Waist circumference= 131cm

Hip circumference= 114cm

Waist hip ratio= 1.15: 1

Respiratory system: RR= 20 cycles/minute, symmetrical chest wall, equal chest expansion, central trachea, resonance percussion notes, vesicular breath sounds, no added sounds.

Cardiovascular system: HR= 102 beats/minutes, regular, full volume, synchronous with other peripheral pulses, no radio-femoral delay. Blood pressure is 200/130mmhg (supine) > 99th percentile for age and sex, 180/120mmhg (sitting) > 99th percentile for age and sex (fig 2). Apex beat=5LICS MCL and heart sounds S1 and S2 only, no murmur.

Abdomen: Protuberant, moves with respiration, soft, mild tenderness in the epigastric region, no palpably enlarged abdominal organs, bowel sounds present and normo-active, sexual maturity rating = 5.

Other systems (central nervous, respiratory, musculoskeletal and ear, nose and throat) are essentially normal.

Diagnosis: Cushings syndrome with complications-hypertension, peptic ulcer disease and chronic kidney diseases

Investigation results includes:

urinalysis-proteinuria ++,

serum cortisol (ug/dl): LNSC- 16.4 (RR- < 4.4), LDDST - 20.0 (RR < 5.0)

Blood glucose level within normal (RBS 5.0- 8.3 mmols/L).

Abdominal ultrasound- Normal

Full blood count: HCT- 26.2% (Anaemia)

HIV test- Negative; HBsAg- Negative; HCVab- Negative

Urine output was within normal (0.7- 1.05mls/kg/min)

Serial serum Urea, electrolytes, creatinine and estimated glomerular filtration rate (eGFR) as shown in table I: serum urea, potassium, and creatinine were increased while serum bicarbonate and sodium are decreased.

Diagnosis was Cushing Syndrome End Stage Renal Disease

Patient was commenced on oral Lisinopril 5mg daily, Tabs α-methyl dopa 250mg 8hrl, Tabs Ketoconazole 200mg 12hrly and Caps Omeprazole 20mg 12hrly

She was counseled for possibility of renal transplant. She was discharged after stabilization to continue follow - up and was followed up at the Endoαcrinology and Nephrology clinics, however, she was lost to follow-up.

Fig. 1: L – R showing supraclavicular pad of fat; abdominal striae; hirsutism and truncal obesity

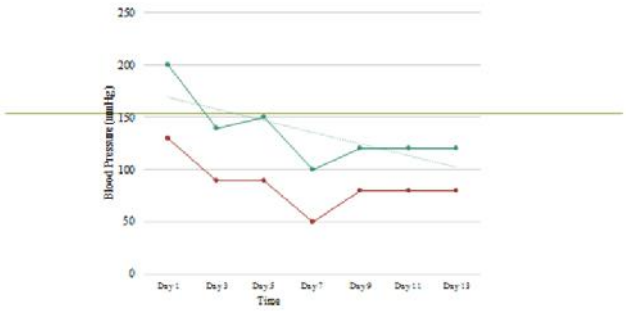

Fig 2: Blood pressure pattern

Table 1: Serum Urea, Electrolytes and Creatinine

Parameter	Day 1	Day3	Day 6
Urea (mmols/ L)	52.9	48.6	44.2
Sodium (mmols/L)	130	141	136
Potassium (mmols/L)	6.6	7.2	4.9
Chloride (mmols/L)	97	102	98
Bicarbonate (mmols/L)	20	16	<10
Creatinine (micromoles/L)	2144	1755	1349
eGFR mls/min/1.73^2	3.01	3.67	4.78

Key: eGFR—Estimated Glomerular Filtration Rate

Discussion

The diagnosis of Cushing syndrome is one of the most difficult problems in endocrinology and is even more so in the presence of renal failure. [2,3]

Clinical features are due to cortisol excess which leads to excessive protein catabolism due to transamination of amino groups of amino acids in the liver, increased production of carbohydrates, fat deposition, potassium loss and enhanced vascular responsiveness to pressor agents.[5,6,7] The clinical features are related to both the degree and duration of excessive cortisol secretion. The cardinal features encountered by decreasing frequency are: 1) hypertension, obesity predominant on the trunk and neck, moon- like face in 90-95% of cases. 2) disturbance of glucose metabolism, purple striae, hirsutism, osteoporosis, hypogonadism in 70-75% of cases and 3) Muscular weakness in 60% and susceptibility to echymoses and infections.[7,8,9] Any of the four cardinal symptoms of cushing syndrome in children – growth failure, obesity, hirsutism and hypertension is highly suggestive of adrenal hyperfunction.[8,9]

In this patient the diagnosis was made based on clinical and laboratory findings. Distinguishing features including dorsocervical and supraclavicular fat accumulation, temporal fullness, violaceous striae and proximal weakness, hypertension and hirsutism are strongly suggestive of Cushing syndrome, These features were prominent in our patient.

Her Late night salivary cortisol`(LNSC) level was 16.4αg/dl (RR < 4.4αg/dl) and Low dose Dexamethasone Suppression Test (LDDST) done showed no suppression with a value of 20.0αg/dl (RR < 5.0αg/dl).

Conclusion

Cushing Syndrome is a debilitating condition which is often times missed due to similar presentation with more common metabolic problems like obesity. There is a need for detailed evaluation of obesity for complications, co-morbidities as well as rare causes other than poor nutrition. Patients presenting with Cushing syndrome should be evaluated for possible renal involvement.

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