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CASE REPORT

ISOLATED SECONDARY HYPOGONADISM PRESENTING WITH SEVERE HYPONATREMIA AND CENTRAL DIABETES INSIPIDUS: A CASE REPORT

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ABSTRACT: A middle-aged educated Manipuri male patient, father of six children presented with 3 years history of progressive generalized fatigue, loss of appetite, bodyache, progressive proximal muscle weakness, bed-ridden for the past 4 months, generalized body swelling along with increased frequency of micturation associated with thirst. There was also history of progressive loss of secondary sexual characters with loss of axillary and pubic hairs and decreasing frequency of shaving with loss of libido and erectile dysfunction for the last 6 months. He attributed these symptoms to his ill health. During the last 2 weeks, he developed productive cough with shortness of breath with orthopnea and with low grade fever. He also gave history of persistent backache and bone pain. Past medical history presented was hypertension for which he was regularly taking amlodipine 5 mg. daily and was under control; however he was drowsier on the same dose with postural symptoms, hence stopped for the last one month. No significant past history of head injury, chronic febrile illness, drug addiction. He is a non-smoker and non-alcoholic. On physical examination, patient was conscious, drowsy, mildly febrile, generalized anasarca, P=64/min, BP=90/60, scattered crackles B/L chest, DTJs depressed with no babinski's sign to suggest focal neurological deficit. Genital examination showed normal penile size with bilateral small (2ml by orchidometer), flabby testes with sparse pubic hairs (facial, axillary hairs were also sparse). Here we are reporting a case of severe hyponatremia with isolated primary hypogonadism and Central Diabetes Insipidus (CDI) since severe hyponatremia is commonly encountered in panhypopituitarism.

KEYWORDS: Hyponatremia, hypotension, hypogonadism, Central Diabetes Insipidus, pituitary bright spot.

INTRODUCTION: Hypogonadotropic hypogonadism is classified depending on different conditions; isolated deficiency or combined deficiency with other pituitary hormones, congenital or acquired (Adult onset) and hypothalamic or hypophyseal defects. Most congenital cases show a type of isolated deficiency caused by genetic abnormality related to KAL1 gene. Most cases of acquired form (more common) show multiple hormone deficiency induced by anatomical disorders such as an infiltrative process or a space-occupied lesion. Psychological stress, nutritional conditions and acute illness can also cause gonadal dysfunction.(1) Idiopathic hypogonadotropic hypogonadism (IHH) is a condition characterized by failure to undergo puberty in the setting of low sex steroids and low gonadotropins and is due to abnormal secretion or action of the master reproductive hormone gonadotropin-releasing hormone (GnRH). Several genes (including GNRH1 itself) have been found to be mutated leading to defective synthesis of GnRH.(2) Lymphocytic hypophysitis is a rare autoimmune cause for Hypogonadotropic hypogonadism generally in peripartum women rarely in men.(3) Diabetes insipidus as a presenting symptom had also been described.(3) Progressive mental status changes have been described in panhypopituitarism.(4) Co-existence of panhypopituitarism with central

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Diabetes insipidus, a rare occurrence had been reported in adult patients.[4,5,6,7] Empty sella syndrome, panhypopituitarism, diabetes insipidus, short stature and obesity in a 18 months old baby probably secondary to obstetrics insult was also reported.[8] Isolated hypogonadotropic hypogonadism is a rare finding and being reported in a patient with Rathke's cleft cyst.[9] The clinical presentation of hypopituitarism, which widely varies, depends on the patient's age, the etiology, and the specific hormone deficiencies, which may occur as isolated deficiencies or in various combinations of MPHD. Signs and symptoms may develop insidiously and can be nonspecific, requiring a high index of suspicion. Hyponatremia unassociated with hypovolemia and unresponsive to fluid restriction but resolves with physiologic corticosteroid replacement with low or normal serum potassium can be the indicator of pituitary failure. The following tables show the investigation reports.

Routines	Values	Remarks
Hb	11.5 gm/dl	
TLC	6080/dl	
DLC	P64 L25 M10 E1	
ESR	40 mm/1st hr	
Platelets	2.6 lac/dl	
ECG	Normal Sinus Rhythm	
Sputum AFB	Negative	
Montoux test	Negative	

Table 1

Biochemistry	Values					Remarks
Na^+ (mEq/L)	120	122	137	141	138	Hyponatremia
K^+ (mEq/L)	5.0	4.9	4.1	4.3	4.8	Relative hyperkalemia
Cl^- (mEq/L)	101	98	104	102	99	
Urea	30mg/dl					
Calcium	8.6mg/dl					Corrected calcium= 8.8mg/dl
Creatinine	1.0mg/dl					
T. bilirubin	1.1 mg/dl					
SGOT	44 IU/ml					
SGPT	21 IU/ml					
T. protein	5.6 gr/dl					
Alb	3.8gr/dl					
FBS	90mg/dl					
PPBS	168mg/dl					
HbA1c	6 %					
Pl fluid analysis	ADA- 10(negative)					Negates Kochs' etiology

Table 2

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Hormonal profile	Values	Remarks
Free T3 nmol/L	6	Normal
Free T4 nmol/L	16	Normal
TSH uIU/ml	1.24	Normal
LH	0.1	Low
FSH	0.6	Low
PRL	10.2	Normal
S. Testosterone (total)	2.6	Low
S. Cortisol (8 am)	9.6	Normal
S. Cortisol Short synacthene test (250mcg)	40.5ug/dl	Normal
ANA		Negative
Anti TPO Antibody		Negative

Table 3

Imaging	Finding	Remarks
CXR P/A view	B/L pulmonary edema	
USG Abdomen	Minimal right-sided pleural effusion	

Table 4

HRCT Chest	B/L consolidation? Kochs 'etiology	
CEMRI (Fig.2, Sellar protocol)	Posterior pituitary bright spot not visualized, rest normal	Attribute of Central DI
Skeletal survey	Anterior wedging of multiple vertebrae	Suggests osteoporotic process

Table 5

FNAC (Fig. 1)	Findings	Remarks
Testes	Poorly cellular smear comprising predominantly of sertoli cells, few spermatids	Features are of secondary testicular failure

Table 6

Special tests	Values (mosm/l)	Remarks
Urine Osmolality	213	Plasma highly concentrated with highly diluted urine suggestive of diabetes insipidus of central origin
Plasma Osmolality	392	

Table 7

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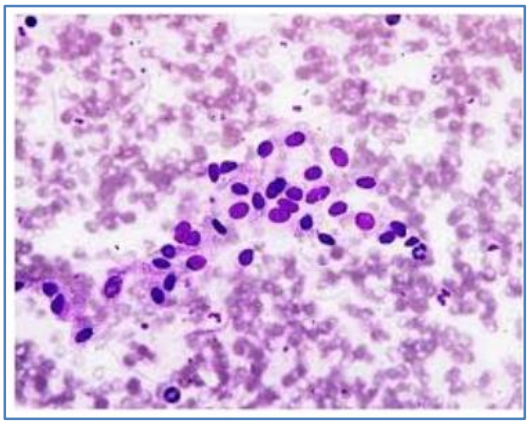

Fig. 1: Cytology of Testes of the Patient

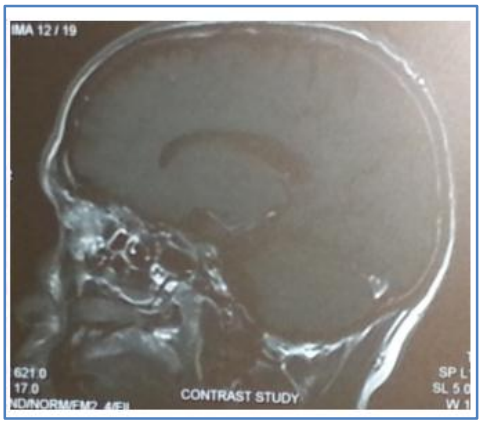

Fig. 2: CEMRI Sella (absent posterior pituitary Bright spot)

DISCUSSION: Preliminary routine investigations showed severe hyponatremia, euglycemic, normal liver and kidney functions. Urine was dilute with specific gravity of 2005 and Ph of 6, however no protienuria was found. Chest imaging showed features suggestive of pulmonary edema with bilateral minimal pleural effusion; however HRCT chest was of the opinion of consolidation suggestive of Kochs'. Pleural fluid analysis did not reveal tuberculosis. CT guided FNA of the lung lesion did not show any granulomatous picture. Chest lesions resolved completely with diuretics on repeat imaging. History and preliminary clinical pictures led to the provisional diagnosis of Panhypopituitarism with secondary testicular failure with Diabetes insipidus. Pituitary hormonal axes were tested, gonadal axis was severely affected with low gonadotropic hormones (Cause for secondary testicular atrophy) with low total testosterone, and thyroid axis was found preserved. Inspite of the normal morning serum cortisol, short Synacthene test with 250mcg was performed to rule out partial adrenal insufficiency, result ruled out adrenal insufficiency. Limited autoimmune markers were performed to rule out autoimmune background and were negative.

For polyuria with dilute urine, 24 hours urinary collection exceeded 5litres and plasma was severely concentrated (392 mosm/l) with a markedly dilute urine(213mosm/L) confirming Diabetes Insipidus as the cause for the prolonged polyuria. Water deprivation test was not performed as the patient's general condition was very poor. However, pituitary imaging failed to visualize posterior pituitary bright spot suggests highly suggestive of central diabetes Insipidus. Short of the confirmatory test, with high index of suspicion, trial of inhaled synthetic vasopressin 1 puff daily evening dose was started. There was an abrupt fall in the amount of urine passed over 24 hours which further strengthened the preliminary clinical diagnosis of CDI. General well-being of the patient improved gradually. Initial severe hyponatremia in the presence of severely concentrated plasma could not be explained completely; however presence of serum K^+ in the upper limit of normal with hypotension could be a reflection of transient adrenal failure which recovered subsequently with the treatment of the febrile illness and partially contributed by hypogonadal state. An osteoporotic feature on skeletal survey though not supported by DEXA Scan was considered as a consequence of long standing hypogonadal state.

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CONCLUSION: Isolated adult onset secondary hypogonadism leading to testicular atrophy co-existing with central diabetes insipidus is a rare combination requiring a strong index of suspicion.

REFERENCES:

1. Yea-Shin Lin et al. Panhypopituitarism & Central Diabetes Insipidus -A Case Report. Formos J Endocrin Metab. 2012; 3(3): 61-66.
2. Yee-Ming Chan et al. GNRH1 mutations in patients with idiopathic hypogonadotropic hypogonadism. PNAS. 2009 July 14; vol. 106: no. 28, 11703–11708.
3. Hamnvik, O.-P. R. et al. Lymphocytic hypophysitis with diabetes insipidus in a young man. Nat. Rev. Endocrinol. 6(2010), 464–470.
4. Dziurzynski K et al. Diabetes insipidus, panhypopituitarism, and severe mental status deterioration in a patient with chordoid glioma: case report and literature review. Endocr Pract. 2009 Apr; 15(3): 240-5.
5. Fumika SUZUKI et al. Adult-onset Idiopathic Hypogonadotropic Hypogonadism due to Isolated Pituitary Gonadotropin Deficiency- Case Report. Internal Medicine. 2004, 43; No. 7. 571-574
6. Santarpia L et al. Diabetes insipidus and panhypopituitarism due to intrasellar metastasis from medullary thyroid cancer. Head Neck. 2009 Mar; 31(3): 419-23.
7. Cacciari E et al. Empty sella in children and adolescents with possible hypothalamic-pituitary disorders. J Clin Endocrinol Metab. 1994 Mar; 78(3): 767-71.
8. Marta Jones et al. Empty Sella Syndrome, Panhypopituitarism, and Diabetes insipidus. Fetal Pediatr Pathol. 2005, Vol. 24, No. 3, 191-204.
9. Trincado P et al. Isolated hypogonadotropic hypogonadism in Rathke's cleft cyst: case report. J Child Neurol. 1998 Aug; 13(8): 402-5.

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