Pituitary Gland Involvement in Granulomatosis with Polyangitis - A Case Report

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Abstract:
Granulomatosis with Polyangitis (GPA) is a multisystem disorder presenting usually with pulmonary and renal involvement. We present here a case GPA with pituitary gland involvement with diabetes Insipidus. She was diagnosed and responded to treatment with intranansla ddAVP. We here, discuss the case and review the literature in regards to the pituitary involvement in GPA.

Key Words: *Granulomatosis with Polyangitis, vasculitis, diabetes insipidus, hypernatremia.*

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INTRODUCTION

Granulomatosis with polyangitis(GPA) is a multisystem disorder characterized by granulomatous systemic vasculitis classically affecting the upper respiratory tract, lungs and kidneys. [1-3] CNS

involvement presenting as panhypopituitrism in GPA is very rare. [4] Here we report a case of panhypopituitrism in a diagnosed case of GPA.

Case

A 20 years' female was diagnosed with GPA, having Positive C-ANCA (57.6 IU/L; NR: <5) one month ago. She was treated with prednisolone and weekly Methotrexate. One month later, she presented in Emergency Department with complains of epigastric pain, vomiting for one day and clinically found to be dehydrated. Her BMI was 16.36kg/m^2. Epigastrium was tender on deep palpation, rest of systemic examination was unremarkable. Initial investigations revealed Acute Pancreatitis and Hypernatremia. Patient was admitted and managed with intravenous fluids and Methylprednisolone 20mg BD was given. Nephrology consult was obtained for deranged renal profile and hypernatremia and Patient was noted to have inappropriately increased urine output in spite of being in negative balance. Fluid resuscitation with hypotonic fluid was initiated. Even after fluid replacement, patient was noted to have high urine output. Further investigations revealed a very low urine specific gravity (SG: 1.005), low Urine Osmolality 140 mosm/kg (300-900mosm/kg) and high serum osmolality 315.8 mosm/kg (275-295mosm/g). Fractional Excretion of Sodium was calculated to be 1.34%. Daily fluid balance and urine analysis is given in Table 1.

Table 1: Urine output from the day of admission till 5th day when polyuria was noted.

In-Hospital Days	DAY 1	DAY 3	DAY 5
Intake/Output	4.6/6.3 L	4.8/5.4 L	5.5/5.4 L

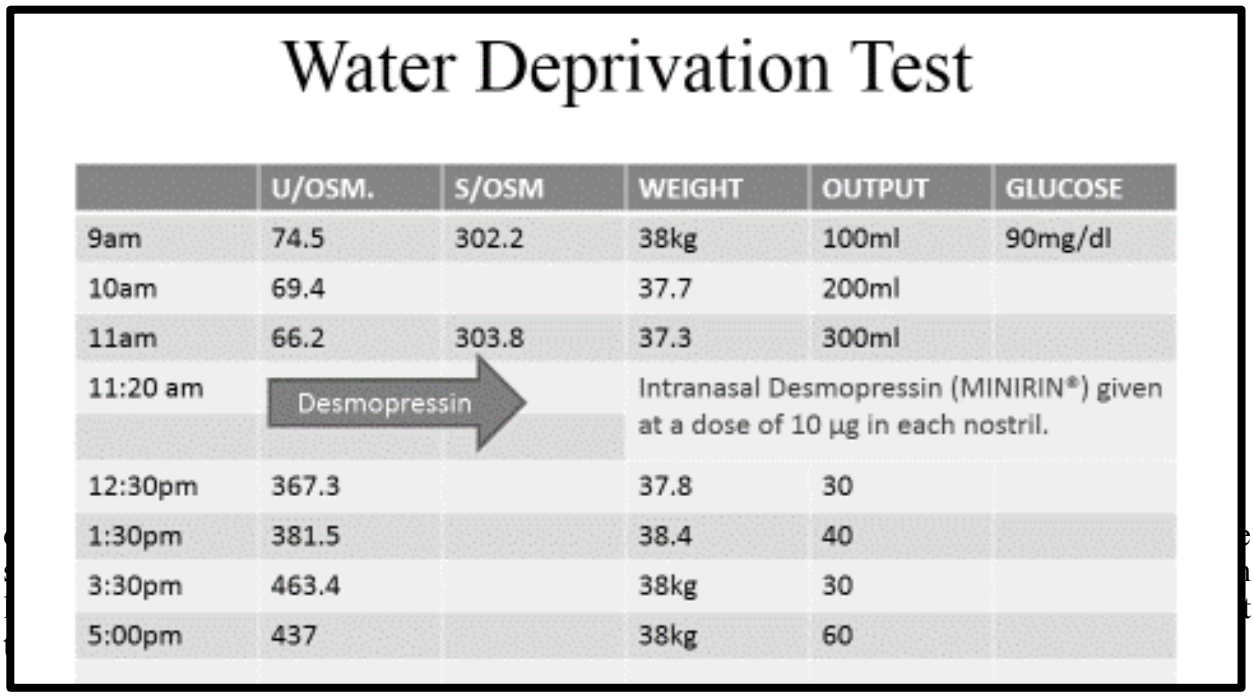
On systemic inquiry she had polydipsia, polyuria and nocturia for last 3 - 4 years. There was no history of weight loss, polyphagia, hyperpigmentation, cough, sputum, epistaxis, visible hematuria. She had no history of previous surgery or trauma. She had menarche at 13 years and secondary amenorrhea for last 3 years. One of her maternal aunt had Systemic Lupus Erythematosus.

Considering polyuria, hypernatremia and dilute urine, a provisional diagnosis of Diabetes Insipidus was made and water deprivation test was carried out presented in Table 2.

Considering positive water deprivation test intranasal vasopressin was started. An endocrinology consult was obtained and Hormone panel were advised. Results are given in table 3. MRI of the sellar area was carried out, which suggested ischemia of the adenohypophysis and posterior pituitary involvement likely secondarily to small vessel vasculitis (GPA) Figure 1.

After initiation of intranasal desmopressin at the dose of 10mcg per day – later increased to 10mcg twice a day, clinical and biochemical profile improved. Serum Sodium was stable at around 135 mmol/L. She was discharged on: Thyroxin 75mcg, Prednisolone 20mg/day, Methotrexate 10mg

Table 2: Water deprivation test and response of intranasal desmopressin administration on urine osmolality and urine output.



Water Deprivation Test

	U/OSM.	S/OSM	WEIGHT	OUTPUT	GLUCOSE
9am	74.5	302.2	38kg	100ml	90mg/dl
10am	69.4		37.7	200ml	
11am	66.2	303.8	37.3	300ml	
11:20 am	Desmopressin		Intranasal Desmopressin (MINIRIN®) given at a dose of 10 µg in each nostril.		
12:30pm	367.3		37.8	30	
1:30pm	381.5		38.4	40	
3:30pm	463.4		38kg	30	
5:00pm	437		38kg	60	

DISCUSSION

GPA is a necrotizing granulomatous small vessel vasculitis that typically involves the upper respiratory tract, lungs and the kidneys. However, multisystem involvement in GPA have also been reported. [5] In our patient, CNS involvement led to panhypopituitarism (central hypothyroidism and both deficit of the gonadal and growth hormone axes). After initiation of Methotrexate and steroids, the patient improved in her primary disease but panhypopituitrism persisted and patient had to stay on exogenous Hormone replacement to settle her symptoms.

Table 3: Laboratory parameters at baseline and at 6 months follow-up.

HORMONE	VALUES at diagnosis	6 months follow up
TSH	0.386uIU/ml	2.1
F T 3	<1.00pg/ml	3.16 pg/mL
F T 4	.94ng/dl	1.45 ng/dL
PROLACTIN	8.9ng/dl	
CORTISOL	105nmol/L	
ESTRADIOL	22pg/ml	
FSH	0.17 Miu/ML	
Serum Sodium	156 mmol/L	142mmol/L
Serum Osmolality	305mosm/kg	300mosm/kg

Various mechanisms have been proposed for pituitary involvement in GPA. The first one is the direct involvement of the vessels of the CNS due to vasculitis. [2-4] The second mechanism involves the dissemination of granulomas from nearby structures and the third mechanism involves the formation of granulomas in the pituitary. [6]

Figure 1: MRI brain showing Diffusely enlarged gland containing a poorly enhancing lesion with midline supra-sellar extension consistent with Granulomatosis with Polyangitis, GPA. Loss of the usual high signal within the posterior pituitary gland.

The major strategy for treatment is based on replacement of deficient hormones and careful monitoring of the response and further adjustment of dosages.

Conclusion:

In conclusion, a good clinical history taking and observation of simple parameters of admitted patients may help in reaching the diagnosis. Our patient had a rare presentation of GPA that responded to the intranasal ddAVP.

Conflict of Interest:

None Declared

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