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Case Report

Internal Medicine Section

Central Diabetes Insipidus Unmasked: A Rare Presentation of Lymphocytic Infundibuloneurohypophysitis

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ABSTRACT

Lymphocytic Infundibulo-Neurohypophysitis (LINH) is a rare autoimmune inflammatory disorder involving the posterior pituitary and stalk. It usually manifests as Central Diabetes Insipidus (CDI) without mass effects or anterior pituitary dysfunction. Due to its non-specific clinical and radiologic features, it remains underdiagnosed and is frequently misclassified as idiopathic CDI. We report a 21-year-old female who presented with polyuria (8-10 L/day) and polydipsia (10-12 L/day) over one month, associated with weight gain and headache. Laboratory evaluation revealed normal glycaemia, serum sodium of 139 mEq/L, urine specific gravity of 1.005, and serum osmolality of 287 mOsm/kg. Water deprivation testing demonstrated a rise in serum sodium to 147 mEq/L, serum osmolality to 305 mOsm/kg, and 3 kg weight loss with inadequate urinary concentration, confirming CDI. MRI pituitary showed posterior pituitary T1/T2 hypointense lesion measuring 7.3×4.3×7.0 mm with stalk thickening (5 mm) and absent posterior pituitary bright spot. Differential diagnoses including tuberculosis, IgG4-related hypophysitis, lymphoma, and infiltrative disorders were considered. Biopsy and anti-rabphilin-3A antibody testing were deferred due to financial constraints. A diagnosis of CDI secondary to LINH was made based on clinicoradiologic correlation. The patient was treated with desmopressin and oral glucocorticoids with marked symptomatic and radiologic improvement on follow-up. This case highlights the role of non-invasive diagnostic strategies and conservative management in LINH in resource-limited settings.

Keywords: Autoimmune diseases, Glucocorticoids, Pituitary stalk

CASE REPORT

A 21-year-old female presented with polyuria (20-25 episodes/day; ~8-10 L/day) and polydipsia (~10-12 L/day, preference for cold beverages) for one month. She also reported facial puffiness, 4 kg weight gain, which was gradual in onset. While there was no fever, headache, visual disturbance, vomiting, psychiatric illness, pregnancy, head trauma, or exposure to immunomodulatory drugs.

On examination, she had mild pallor. However, there was no evidence of icterus, clubbing, oedema, lymphadenopathy, or Cushingoid features. Vital signs were stable. Family history was non-contributory. Baseline investigations showed haemoglobin 9.7 g/dL, MCV 77 fL (microcytosis mild clinical pallor), serum sodium 139 mEq/L, potassium 4.2 mEq/L, chloride 105 mEq/L, serum creatinine 0.63 mg/dL, urea 16 mg/dL, post-meal glucose 89 mg/dL, BMI 22.8 kg/m^2, and urine specific gravity 1.005 with no albuminuria. Serum osmolality was 287 mOsm/kg [Table/Fig-1]. A complete anterior pituitary hormonal evaluation was performed, which was largely unremarkable except for mild hyperprolactinaemia [Table/Fig-2].

Water deprivation test showed serum sodium rising to 147 mEq/L (target end point), serum osmolality to 305 mOsm/kg, body weight reduction of 3 kg (achieved target end point), and urine specific gravity only 1.015, confirming CDI [Table/Fig-3]. MRI pituitary [Table/Fig-4a,b] showed a 7.3×4.3×7.0 mm posterior pituitary T1/T2 hypointense lesion with stalk thickening (5 mm) and absent posterior pituitary bright spot.

Various differentials were also considered including tuberculous hypophysitis, IGG4-related hypophysitis, lymphoma, and sarcoidosis. However, chest X-ray was normal, there was no evidence of hilar lymphadenopathy and patient didn't have any symptoms that were suggestive of tuberculosis and no systemic lymphadenopathy was seen. There was no clinical evidence of erythema nodosum, lupus pernio, or joint pain. There was no history of renal calculi; ultrasonography did not reveal any renal stones, and serum calcium levels were normal (9.8 mg/dL). Hence, sarcoidosis was clinically

Investigations	Findings
Haemoglobin	9.7 g/dL
Mean Corpuscular Volume (MCV)	77 fL
Serum creatinine	0.63 mg/dL
Serum urea	16 mg/dL
Serum potassium	4.2 mEq/L
Urine pH	6.5
Post-meal blood glucose	89 mg/dL

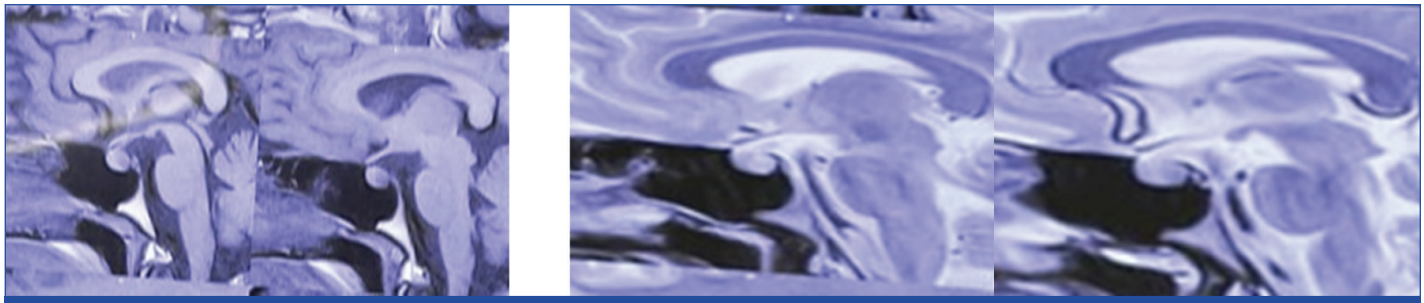
[Table/Fig-1]: Routine investigations.

Hormonal assay	Value obtained
8 AM cortisol	4.6 µg/dL
LH	19.5 IU/L
FSH	6.09 IU/L
Prolactin	41 ng/mL
ACTH	64.4 pg/mL
TSH	4.24 µIU/mL

[Table/Fig-2]: Complete hormonal work-up.
ACTH: Adrenocorticotropic hormone; TSH: Thyroid-stimulating hormone; LH: Luteinising hormone; FSH: Follicle-stimulating hormone

Tests	Pre-test	Post-test
Serum Na	139 mEq/L	147 mEq/L
Potassium (K)	4.2 mEq/L	4.4 mEq/L
Chloride (Cl)	105 mEq/L	113 mEq/L
Urea	16.7 mg/dL	16.8 mg/dL
Creatinine	0.63 mg/dL	0.69 mg/dL
Serum osmolality	287 mOsm/kg	305 mOsm/kg
Weight	55.8 kg	53.5 kg

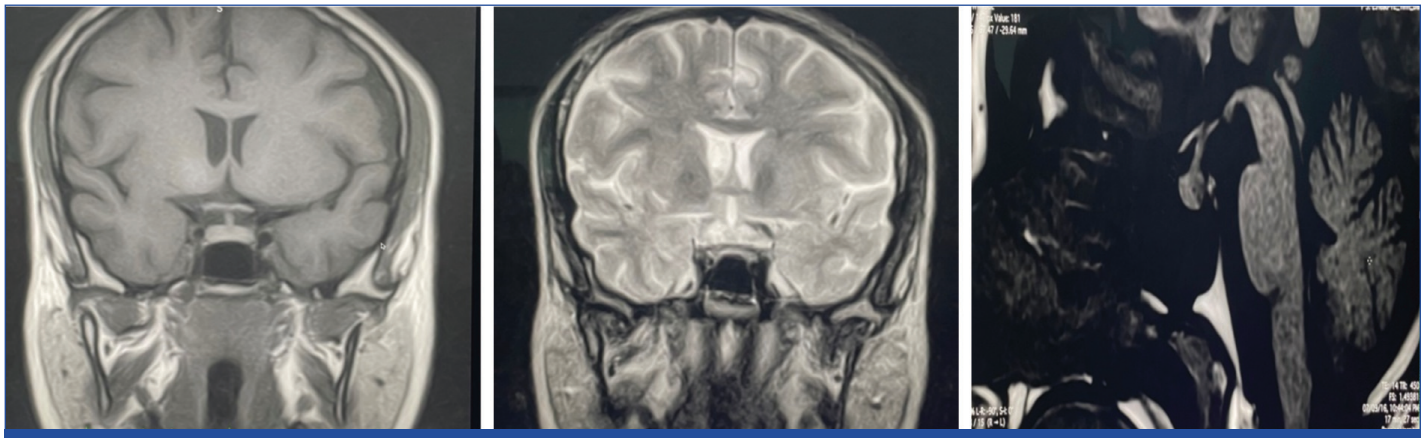
[Table/Fig-3]: Pre- and post-water deprivation test showing increase in serum osmolality and weight loss.



[Table/Fig-4a,b]: MRI showing a well-defined T1/T2 hypointense mass (7.3×4.3×7.0 mm, CC×AP×TR) in the posterior pituitary with a pituitary stalk thickness of 5 mm.

ruled out with minimal supportive investigations. However, serum IgG4 levels, anti-rabphilin-3A antibody assay, IGRA testing, and pituitary biopsy were advised but could not be performed due to financial constraints and patient refusal. Based on clinicoradiologic correlation and therapeutic response, the patient was diagnosed with CDI due to LINH. Prednisolone was started at 40 mg/day for four weeks, followed by tapering by 5 mg every two weeks over the next three months. Maintenance dose of 5 mg/day was continued for the next six months. Objective criteria for tapering included daily urine output, serum sodium, and repeat MRI findings. The patient was subsequently taken off steroids and remains on regular follow-up. Desmopressin acetate 0.1 mg twice daily was continued throughout.

After the initiation of the treatment, the patient was at regular follow-up every three months. Prednisolone was continued at the lowest possible dose of 5 mg despite no mass effect or visual disturbances. Moreover, during the follow-up i.e., after three months, the patient did not report any symptoms of anterior pituitary hormone deficiency. Thus, the patient remained free from any neurosurgical intervention. During follow-up period at 6th month, MRI pituitary protocol was performed, which showed the well-defined oval shaped T1 and T2 hypointense lesion of size 4.2×3.1×6 mm with an absent posterior pituitary bright spot. While comparing with the previous MRI there was a significant reduction in the size of the pituitary stalk and pituitary mass involving the posterior hypophysis [Table/Fig-5].



[Table/Fig-5]: Follow-up MRI (Pituitary Protocol) showed a well-defined, oval-shaped T1/T2 hypointense lesion (4.2×3.1×6 mm, CC×AP×TR) with an absent posterior pituitary bright spot. Compared to the previous MRI, there was a significant reduction in the size of both the pituitary stalk and the posterior pituitary mass.

DISCUSSION

The LINH is a rare autoimmune inflammatory disorder selectively involving the posterior pituitary and pituitary stalk and is a recognised cause of idiopathic CDI [1,2]. In the present case, the patient presented with classical features of CDI including marked polyuria, polydipsia, rising serum sodium, and serum osmolality on water deprivation testing. MRI demonstrated stalk thickening with an absent posterior pituitary bright spot, a characteristic hallmark of LINH. These key findings allowed a strong clinicoradiologic diagnosis without resorting to invasive pituitary biopsy.

Several recent case reports and reviews have emphasised similar imaging patterns in LINH, particularly stalk thickening and absence of the T1 posterior pituitary bright spot [3-5]. Hasebe M et al., reported spontaneous regression of a LINH lesion without surgical intervention, supporting conservative management [5]. Langlois F et al., also highlighted that posterior pituitary involvement frequently presents without significant mass effect, unlike pituitary adenomas [3]. The present case mirrors these observations with both symptomatic and radiologic regression following conservative therapy.

Differentiating LINH from other causes of CDI is critical. Conditions such as tuberculosis, IgG4-related hypophysitis, lymphoma, sarcoidosis, and germinoma may produce similar radiologic findings [6-9]. In this patient, chest X-ray was normal and there were no systemic features of malignancy or granulomatous disease. However, serum IgG4 levels, anti-rabphilin-3A antibodies, IGRA testing, and pituitary biopsy could not be performed due to financial constraints. Arihara Z et al., have shown that anti-rabphilin-3A antibodies are highly specific for LINH, but their availability is limited in many settings [4]. Hence, the diagnosis in our case remained clinic-radiologic.

Management of LINH remains controversial. Desmopressin is the cornerstone of CDI treatment, while the role of glucocorticoids is debated [10,11]. Our patient showed marked improvement with glucocorticoid therapy and desmopressin. In contrast, in the case reported by Hasebe M et al., after one year of follow-up, the pituitary stalk thickening regressed spontaneously without surgical intervention or glucocorticoid treatment; however, the posterior pituitary bright spot remained absent, and CDI did not improve [5]. In contrast, the systematic review and meta-analysis by Donegan D et al., demonstrated improved recovery of anterior pituitary hormone deficits with steroids, but little effect on CDI itself [12]. Surgery is reserved for compressive symptoms or diagnostic uncertainty, neither of which existed in this case.

While we also want to emphasise that pituitary biopsy, the gold standard for diagnosis, could not be performed due to patient refusal and financial constraints. Formal dynamic anterior pituitary testing was not necessary since anterior pituitary function was intact, serum IgG4 levels, IGRA testing, and anti-rabphilin-3A

antibody assay were also not performed due to financial constraints. Although MRI findings strongly supported LINH, imaging however is not gold standard and pathognomonic. These limitations may restrict definitive aetiological confirmation.

CONCLUSION(S)

The LINH is a rare but important cause of CDI and should be suspected in young patients with CDI and pituitary stalk thickening. This case highlights the diagnostic value of water deprivation testing and characteristic MRI findings in resource-limited settings where biopsy and specialised antibody testing are not feasible. Conservative management with desmopressin and glucocorticoids resulted in both clinical and radiological improvement. Early recognition allows effective non-surgical treatment and prevents unnecessary interventions. Long-term follow-up with serial imaging and hormonal assessment is essential. This case reinforces the usefulness of a clinicoradiologic approach in LINH.

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