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Abstract #1182615: Panhypopituitarism Induced by COVID-19 Infection

Aseel Yaseen

Shiri Levy

Meridian Jersey Shore Endocrinology; Raquel Ong, MD - Hackensack Meridian Jersey Shore Endocrinology; Krishna Chalasani, MD - Hackensack Meridian Jersey Shore Endocrinology; Soemiwati Holland, MD - Hackensack Meridian Jersey Shore Endocrinology; Jennifer Cheng, DO - Hackensack Meridian Jersey Shore Endocrinology

Introduction: Hyponatremia is a known complication after transsphenoidal pituitary surgery (TSS), most commonly caused by syndrome of inappropriate antidiuretic hormone secretion (SIADH) and rarely caused by cerebral salt-wasting (CSW). Differentiating between these two etiologies remains a clinical challenge but is important as they have opposing treatments. We present a case of a man who underwent TSS for nonfunctional pituitary macroadenoma and subsequently developed CSW.

Case Description: A 67 year-old man with no significant past medical history presented to the emergency department with sudden-onset headaches. CT head showed a 3.3 cm sellar mass. Dedicated MRI pituitary imaging showed a 3.6 x 2.3 x 2.2 cm sellar mass with superior displacement of the optic chiasm, invasion into the cavernous sinus, and features suggesting pituitary apoplexy. Preoperative biochemical evaluation showed no pituitary hormonal abnormalities. The patient was given dexamethasone to decrease cerebral edema and underwent emergent transsphenoidal pituitary tumor resection. Final pathology showed pituitary adenoma with extensive necrosis and negative staining for ACTH, GH, TSH, and prolactin. Postoperative course was complicated by hyponatremia, central adrenal insufficiency requiring hydrocortisone, and bacterial meningitis requiring IV antibiotics. Serum sodium was 129 mEq/L with corresponding serum osmolality 280 mOsm/kg, urine sodium 117 mEq/L, and urine osmolarity 755 mOsm/kg, suggesting SIADH or CSW. The patient was treated with 1 liter fluid restriction and sodium chloride tablets up to 4 grams three times daily for presumed SIADH. On re-evaluation for refractory hyponatremia, he had orthostatic hypotension with adequate urine output which distinguishes CSW from SIADH. The patient was taken off fluid restriction and received volume repletion with isotonic saline. Serum sodium levels improved with appropriate rate of correction. The patient was discharged home on physiologic dose hydrocortisone and sodium chloride tablets 1 gram three times daily to maintain adequate serum sodium levels.

Discussion: This rare case of a patient with CSW after TSS, complicated by postoperative central adrenal insufficiency and bacterial meningitis, highlights the difficulty in diagnosing the etiology of hyponatremia and the importance of distinguishing CSW from the more common SIADH as the treatments are opposing. When evaluating hyponatremia, we should assess serum osmolality, urine sodium, and urine osmolality. SIADH and CSW can both cause inappropriately concentrated urine, so we must assess volume status to distinguish between the two. SIADH causes euvolemic hyponatremia, whereas CSW causes hypovolemic hyponatremia with positive orthostatics, hypotension, poor skin turgor, decreased central venous pressure, or elevated hematocrit. SIADH is treated with fluid restriction, whereas CWS is treated with volume repletion with either isotonic saline for mild to moderate cases or 3% hypertonic saline for severe cases. Outpatient management with sodium chloride tablets may be necessary as CSW may not resolve until weeks to months from onset.

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Panhypopituitarism Induced by COVID-19 Infection

Author Block: Aseel Yaseen, MD - Henry Ford Hospital; Shiri Levy, MD - Henry Ford Hospital

Introduction: Coronavirus disease 2019 (COVID-19) infection has led to multiple endocrinopathies. We present a case of panhypopituitarism induced by COVID -19 infection.

Case Description: 76 yo male with history of type 2 diabetes, hypertension, and 1.5 cm stable, nonfunctioning, pituitary macroadenoma diagnosed in 2017 had multiple admissions for altered mental status and hyponatremia following COVID-19 infection in April 2020. Workup revealed low free T4 0.60 ng/dL (0.8-1.8), low random cortisol 1.8 mcg/dL(2.9-19.4), high prolactin 33.5 ng/mL (2-18), low total testosterone < 10 ng/dl (175-781), SHBG 32.7 nmol/L (13.3-89.5), and low gonadotropins.

While hospitalized, he was diagnosed with pan-hypopituitarism and started on glucocorticoids and levothyroxine. Repeat MRI pituitary done after discharge, documented stability of the macroadenoma without hemorrhage.

To date, the patient remains on glucocorticoid replacement and thyroid hormone replacement in stable state.

Discussion: Hypopituitarism from any etiology has an incidence of 4.2 per 100,000. Hormone replacement therapy remains the mainstay of treatment. This case represents a patient who had unexplained recurrent hyponatremia after COVID-19 infection and later diagnosed with pan-hypopituitarism.

Given the continued pandemic, more endocrinopathies related to the COVID-19 infection have been reported. We have data for other viral infections, such as SARS and Dengue, documenting pituitary dysfunction. Review of literature documents SARS infection leading to post infectious hypophysitis with resulting secondary hypocortisolism and hypothyroidism. The cause was thought to be virus binding to pituitary angiotensin-converting enzyme 2 (ACE2) receptors. There is also data supporting COVID-19 infection leading to pituitary apoplexy and hypophysitis, though the number of cases reported is limited.

The pathophysiology is thought to be the COVID 19 virus binding to pituitary ACE2 receptors for which it has a 10-20-fold higher affinity. Furthermore, the hypothalamus also expresses ACE2 receptors making it a target for the virus. The binding leads to cellular destruction and autoimmune collateral damage. Hypothalamic pituitary dysfunction could be due to direct effect of virus. The virus can also lead to reversible hypophysitis.

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Hypertension (HTN) and Diabetes (DM) Improvement During Osilodrostat Therapy in Patients with Cushing's Disease (CD): Analyses from the Phase III LINC 3 study

Author Block: Rosario Pivonello, MD - Dipartimento di Medicina Clinica e Chirurgia, Sezione di Endocrinologia, Universitá Federico II di Napoli, Naples, Italy; John Newell-Price, PhD - Department of Oncology and Metabolism, The Medical School, University of Sheffield, Sheffield, UK; Akira Shimatsu, MD - Omi Medical Center, Kusatsu, Japan; Andre Lacroix, MD - Centre hospitalier de l'Université de Montréal, Montreal, Canada; Richard Auchus, PhD -