



UNDIAGNOSED PRIMARY ADRENAL INSUFFICIENCY PRESENTING AS ADRENAL CRISIS FOLLOWING COVID-19 VACCINATION: A CASE REPORT

MAJDOLINE JAYOUSHE ARABELLE ABELLARD, ADEOLA ADETUNJI, ANNE MARIE BONAGURO,
SPENCER DELEVEAUX, MATTHEW DEL PINO, MELANIE GORDON**, JOUMANA CHAIBAN**
UNIVERSITY OF ILLINOIS AT CHICAGO/ADVOCATE CHRIST MEDICAL CENTER

Learning Objectives

- Patients with AI may benefit from an increase in glucocorticoid dosage with administration of the COVID19 vaccine, similar to the sick day management.

Introduction

Adrenal insufficiency (AI) is classified as primary if it is due to a deficiency in cortisol production by the adrenal glands or secondary if there is a deficiency in adrenocorticotrophic hormone (ACTH) secretion by the pituitary gland. The most life-threatening manifestation of AI is an adrenal crisis which may be precipitated by a severe stressful condition. We report herein a patient with undiagnosed AI who presented in adrenal crisis following administration of the COVID-19 vaccine.

Case Presentation

A 26-year-old Caucasian woman with a history of Hashimoto's thyroiditis, on levothyroxine, presented to urgent care for evaluation of fevers, chills, myalgias, nausea and vomiting that started eight hours after receiving the second dose of the Moderna COVID-19 vaccine. She had COVID infection approximately 45 days prior and had been complaining of fatigue, weight loss and salt cravings. While at urgent care, she had a witnessed tonic-clonic seizure and was transferred to the hospital. On presentation, she was altered, febrile, tachycardic, hyponatremic, hyperkalemic and hypotensive. Initial laboratory tests were significant for serum sodium 122 mEq/L, chloride 95 mEq/L, bicarbonate 15 mEq/L, glucose 52 mg/dL, potassium 5 mEq/L, TSH 2.9 mU/L, serum osmolality 263 mOsm/kg. CBC showed persistent pancytopenia with WBC count as low as 0.6 k/uL, RBC count 3.16 k/uL, Hgb 9.2 g/dL, platelet count 76000/microL. Covid 19 PCR was negative. Additional labs showed reticulocyte index 0.49%, creatine phosphokinase 30422 units/L, elevated ACTH 746 mcg/dL, low aldosterone level, low zinc level, AM cortisol 1.6 mcg/dL and positive 21-alpha hydroxylase antibodies and thyroglobulin antibodies. Brain MRI and a CT of the abdomen and pelvis were unremarkable. She also had a bone marrow biopsy that showed normal hematopoietic features. The patient was started on Intravenous (IV) fluids and hydrocortisone 50 mg IV every 6 hours which resulted in good clinical improvement. She was transitioned to oral fludrocortisone and hydrocortisone prior to discharge.

References

1. Major A, Chacko K. Routine vaccinations as a precipitant of adrenal crisis in adrenal insufficiency. *Intern Med J.* 2018;48(3):360-361. doi:10.1111/imj.13720
2. Almeida, M. Q., & Et al. (2020). Adrenal insufficiency and glucocorticoid use during the COVID-19 pandemic. *Clinics*, 75. <https://doi.org/10.6061/clinics/2020/e2022>
3. Isidori et al., A. M. (2020). COVID-19 infection and glucocorticoids: Update from the Italian society of endocrinology expert opinion on steroid replacement in adrenal insufficiency. *Journal of Endocrinological Investigation*, 43(8), 1141-1147. <https://doi.org/10.1007/s40618-020-01266w>
4. Katznelson, L., & Gadelha, M. (2021). Glucocorticoid use in patients with adrenal insufficiency following administration of the COVID-19 vaccine: A pituitary society statement. *Pituitary*, 24(2), 143- 145. <https://doi.org/10.1007/s11102-021-01130-x> - Taniguchi, et al., J. (2020).
5. Adrenal crisis precipitated by influenza A led to the diagnosis of Sheehan's syndrome 18 years after postpartum hemorrhage. *Clinical Case Reports*, 8(12), 3082- 3087. <https://doi.org/10.1002/ccr3.3355>

Discussion

Practice guidelines usually recommend increasing the dose of glucocorticoids for patients with AI during precipitant illness and stress. This case raises important concerns regarding the risk of adrenal crisis and the need for steroid adjustments post vaccination. There is insufficient guidance regarding the best approach and risk of adrenal crisis after vaccination as well as insufficient data regarding the potential impact of glucocorticoid therapy on the immune response to vaccines. Our case suggests that patients with AI may benefit from an increase in glucocorticoid dosage with administration of the COVID19 vaccine, similar to the sick day management. This could be done the day before vaccination or the day of vaccination or if symptoms start to occur. More robust data are needed to better elucidate the best approach to glucocorticoid therapy in such scenarios.