

Prevalence of Hypercortisolism in Patients With Type 2 Diabetes Mellitus With Incidentally Found Adrenal Adenomas: An Interim Analysis

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INTRODUCTION

- 5% to 30% of adrenal adenomas discovered incidentally during imaging are cortisol-secreting¹
- Patients with newly discovered adrenal adenomas should undergo screening for hypercortisolism (Cushing syndrome)²
- Prevalence rates of hypercortisolism ranging from 2% to 9% have been reported in patients with type 2 diabetes mellitus (T2DM) who lack overt clinical features of cortisol excess (proximal muscle weakness, facial plethora, violaceous striae)³⁻⁵
- Here we report the interim results of an investigator-initiated study on the prevalence of hypercortisolism in patients with T2DM with incidentally discovered adrenal adenomas at the NYC Health + Hospitals/Queens' Diabetes Center of Excellence in Queens, NY

HYPOTHESIS

- Hypercortisolism is prevalent in patients with T2DM diagnosed with adrenal adenomas

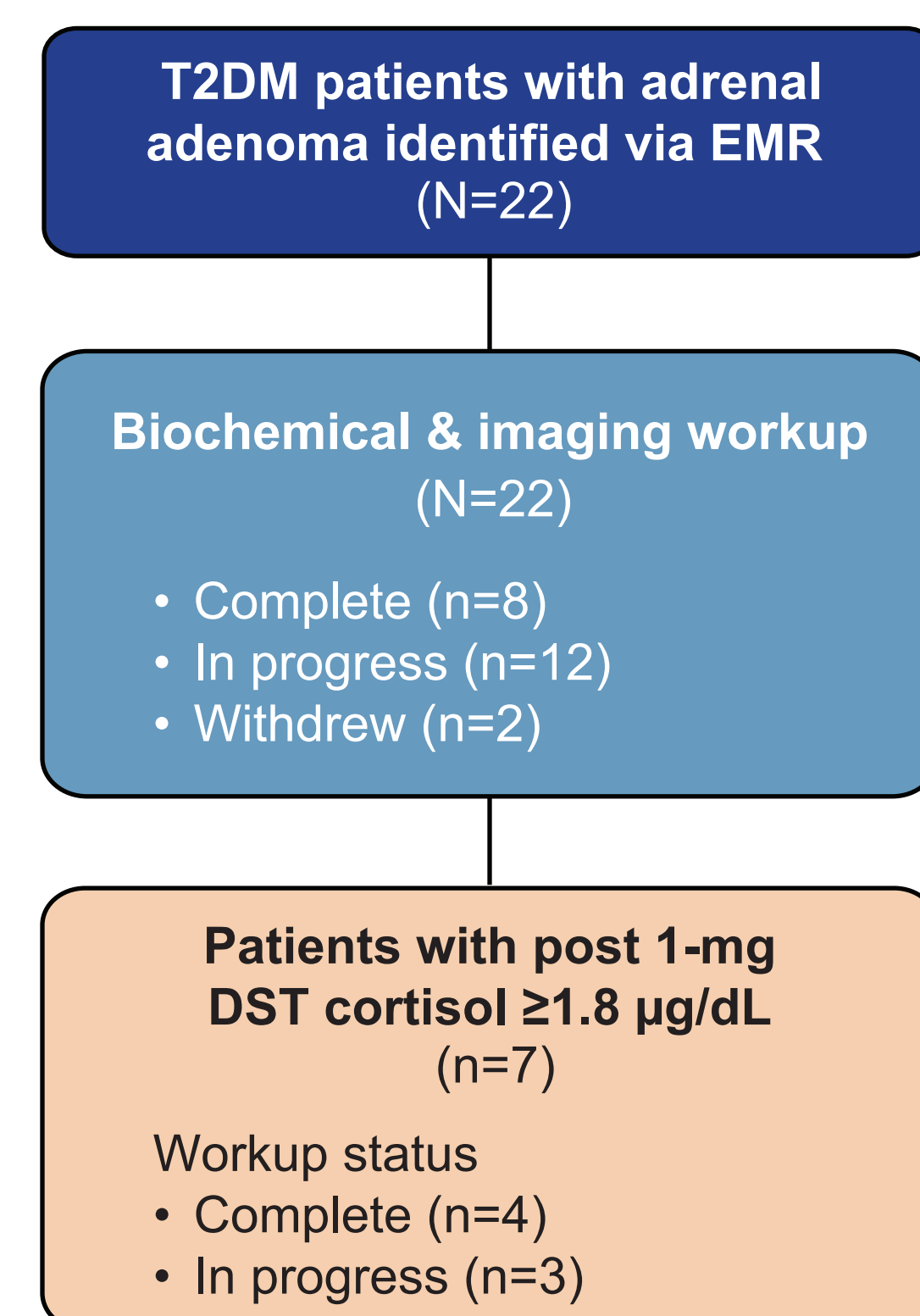
PATIENTS AND METHODS

- Electronic medical records (EMR) were reviewed for patients ≥18 years old with T2DM and adrenal adenomas incidentally found from October 2014 to October 2017
- Excluded patients were those:
 - Taking exogenous systemic corticosteroids
 - Pregnant at the time computed tomography (CT) scan performed
 - Having a life-threatening condition, including metastatic cancer
- Hypercortisolism was assessed using 1-mg dexamethasone suppression test (DST) (diagnostic threshold ≥1.8 µg/dL) either retrospectively (if available per EMR) or prospectively
 - Additional biochemical assessments to support diagnosis included adrenocorticotrophic hormone (ACTH) and dehydroepiandrosterone-sulfate (DHEA-S)
- Target study enrollment: 30 patients

INTERIM RESULTS

- To date, EMR review has identified 22 patients with T2DM and adrenal adenoma (**Figure 1**)
 - Eight of the 22 have completed CT and biochemical assessments

Figure 1. Patients



EMR, electronic medical record; DST, dexamethasone suppression test; T2DM, type 2 diabetes mellitus.

- Patient characteristics are shown in **Table 1**

Table 1. Demographic and Clinical Characteristics	
Characteristic	Patients (N=22)
Sex, M/F, n (%)	7 (31)/15 (69)
Age, years, mean (range)	64.3 (46-89)
HbA1c, %, mean (range)	7.7 (6.5-11.1)

HbA1c, glycated hemoglobin.

- Seven of 12 patients with available data had abnormal post 1-mg DST (**Table 2**, shading)
- Of the 8 patients with workup completed, 4 (**Table 2**, boxes) had abnormal post 1-mg DST cortisol (range: 2.2-8.0 µg/dL)
- In these 4 patients:
 - Adrenal nodule size ranged from 1.0-2.4 cm
 - HbA1c ranged from 6.9%-10.4%
- 3 of the 4 patients had original CT scan reports available
 - In all 3, adrenal nodule size was stable over time
- Complete biochemical and/or CT workup results are pending in 12 patients
 - In 3 of these 12, an abnormal post 1-mg DST result (range: 3.3-3.98 µg/dL) has been observed (adrenal nodules ≤1.3 cm) (**Table 2**)

Table 2. Biochemical Testing and Imaging Results for Each Patient (n=20)					
Workup Status	HbA1c (%)	1-mg DST (µg/dL)	ACTH (pg/mL)	DHEA-S (µg/dL)	CT Scan Report
COMPLETE	8.7	3.5	27	Normal	1.2 cm left adrenal nodule
COMPLETE	10.4	8.0	27	Low	1.0 cm left adrenal nodule
COMPLETE	6.9	2.2	19	Normal	1.2 x 1.2 cm left adrenal and 1.5 x 1.2 right adrenal nodule
COMPLETE	7.2	2.2	10	Low	2.4 x 1.7 cm stable lipid-rich adenoma
COMPLETE	6.5	0.71	84	Normal	1 cm right inferior pole nodule
COMPLETE	7.8	1.5	56	Low	2.5 cm stable left adrenal adenoma
COMPLETE	7.8	0.7	45	Normal	1.4 cm left adrenal nodule
COMPLETE	7.4	1.6	18	Low	1.4 cm lipid-rich right adrenal nodule
Original CT pending	6.6	3.4	20	Normal	1.0 x 1.1 cm left adrenal nodule
Repeat CT pending	7.2	3.3	10	Normal	1.2 x 1.1 cm right adrenal nodule
Labs pending	6.7	3.98			1.3 cm right adrenal adenoma, nodular thickening in the left
Repeat CT pending	7.0	1.1	18	Normal	1.2 cm right adrenal nodule
Labs pending	11.1		7	Low	3.3 x 2.4 cm right adrenal nodule
Labs pending	7.2				5.1 x 3.5 cm right adrenal mass
Labs/repeat CT pending	7.0		15	Normal	2.1 cm left adrenal nodule
Labs/repeat CT pending	9.1				1.2 x 1.9 cm left adrenal nodule
Labs/repeat CT pending	7.1				Right mass not significantly changed; does not meet criteria for lipid-rich adenoma
Labs/repeat CT pending	7.1		<5	Low	Left adrenal adenoma
Labs/repeat CT pending	9				1.8 cm right and 1 cm left adrenal nodules
Labs/repeat CT pending	6.5				1.8 x 1.4 cm right adrenal nodule

Two patients withdrew.

Shading indicates abnormal post 1-mg DST cortisol. Normal values: post 1-mg DST cortisol, <1.8 µg/dL; ACTH, 6-50 pg/mL.

ACTH, adrenocorticotrophic hormone; CT, computed tomography; DHEA-S, dehydroepiandrosterone-sulfate; DST, dexamethasone suppression test; HbA1c, glycated hemoglobin.

LIMITATIONS

- Retrospective data collection and lack of baseline patient characterization
- Only 1 positive DST result used to identify hypercortisolism
- No assessment of clinical signs and symptoms of hypercortisolism collected

CONCLUSIONS

- We have identified 22 patients with T2DM and adrenal adenoma from our center
- To date, we have completed evaluation in 8/22 patients and have obtained DST results in 12/22 patients
- Among the 12 patients, 7 (58%) had an abnormal post 1-mg DST cortisol (≥1.8 µg/dL)
- Although full data analysis is pending, the interim results suggest a high prevalence of hypercortisolism in patients with adrenal adenomas and T2DM identified through systematic EMR review
- It is important to identify underlying hypercortisolism in patients with T2DM and adrenal adenomas
- While screening all patients with T2DM for hypercortisolism is not recommended, our findings suggest that reviewing EMR data is a useful approach to identifying patients with adrenal adenomas who have not been formally worked up for autonomous cortisol hypersecretion

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