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A Unique Cause of Anion Gap Metabolic Acidosis: Euglycemic DKA
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INTRODUCTION
SGLT-2 inhibitors are a new class of oral diabetes medication that have been associated with a rare complication- euglycemic DKA. This case illustrates the importance of recognizing this clinical entity that can lead to a gapped metabolic acidosis in the setting of a normal glucose level.

HISTORY
CHIEF COMPLAINT: Vomiting, weakness, palpitations
HPI: A 34 year old female with a past medical history significant for AML s/p multiple past chemo treatments, DM Type 2, HTN, anxiety and depression presented to the ED with a complaint of fatigue after a night of vomiting >6 (non bloody) episodes and decreased PO intake. Although her complaints ranged from chest pain to abdominal pain, she specifically came to the ED for evaluation of her fatigue after a night of vomiting >6 (non bloody) episodes and decreased PO intake.

PAST MEDICAL & SURGICAL HISTORY: Dx w AML in 2011, anxiety, depression, DM II, Hystectomy
SOCIAL HISTORY: No smoking, alcohol or illicit drug use, no history of SI/H, poor compliance with glucose monitoring diabetes
MEDICATIONS: • Wellbutrin • Aspirin • Inovakan • Klonopin • Levernir • Victoza

ALLERGIES: Ambien

PHYSICAL EXAM
VITAL SIGNS: BP - 145/85 HR - 165 RR - 18 T - 99 F O2 - 99% RA
GEN: Anxious,moaning in room
HEENT: PERRLA, EOM, moderate DMM
PULM: CTABL
CARDs: Sinus tachy, no M/R/I. Good distal pulses.
ABD: Soft, nondistended, nontender. +BS.
SKIN: Warm, dry, no rashes.
NEURO: AAO x 3, CN II-XII intact.
PSYCH: agitated, anxious, tearful.

LABORATORY STUDIES

| AST: 87 | UA: ketones | TROP: <0.02 | LACTATE: 2 |
| ALT: 47 | UPrep: Negative | TSH: 1.39 | AG: 16 |

DIFFERENTIAL DIAGNOSIS
Having an anion gap metabolic acidosis of 16 with a bicarbonate of 8, the etiology was not readily apparent with the patient’s normal lactate, absence of fever and only mildly elevated serum glucose 220.

- Infectious
- Structural (PE)
- Toxicologic

EXPANDED LABS

- VBG: 6.91/24/39/97/95
- ACETONE: 47
- BHB: 7.16
- UDS: + opiates
- ASA: 4
- APAP: <2
- TOX alcohols: Neg
- D-dimer: 0.68
- ECG: Sinus145

HOSPITAL COURSE OF CARE
Her expanded labs ultimately revealed a worsening acidosis with positive blood and urine ketones, leading to the diagnosis of euglycemic DKA. She was admitted to the ICU on both an insulin and bicarbonate drip with dextrose containing fluids and frequent glucose checks. After her gap closed, her home medications revealed the culprit of this unique cause of DKA, her SGLT2 inhibitor which was immediately discontinued.

DISCUSSION

EUGLYCEMIC DKA: Although DKA is classically taught to include acidosia, hyperglycemia and increased plasma ketones, euglycemic DKA is basically DKA without the hyperglycemia. It is a more rare diagnosis; however, ED providers should have it on their differential of AGMA, specifically in diabetic patients on SGLT-2 inhibitors.

MECHANISM:
SGLT-2 inhibitors block sodium glucose co transporters in the proximal renal tubules which promotes glucose excretion. Just as in normal diabetic ketotic states, when the body cannot use blood glucose for energy, ketones and acidosia will ensue; however, since the overall glucose levels in the body are lower, the pt will be euglycemic.

TREATMENT: The treatment of eukdia is practically identical to the management of DKA with a few added caveats.
- IV fluids with dextrose
- IV Insulin drip
- Frequent Glucose monitoring
- Discontinue all SGLT-2 inhibitors

REFERENCES: