



44 Year-Old Man with Hyperglycemia

Endorama

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HPI

- ▶ 44 year-old AA male with a history of AIDS (CD4 count 54) on ART, psoriasis, recent admission for septic arthritis of the right ankle, now admitted with fatigue, nausea, polyuria, polydipsia, and blurry vision.
- ▶ Currently not on any diabetes medications.
- ▶ 2 years ago, was placed on insulin due to ART-induced hyperglycemia.
- ▶ However, patient only required insulin for 2 months and was weaned off after blood sugars normalized with intentional weight loss of 50 lbs.

HPI

- ▶ Symptoms of fatigue, nausea, polyuria, polydipsia, and blurry vision x 2 weeks
- ▶ Was seen in clinic by PCP, who noted fingerstick of >500
- ▶ Has not been watching his diet.
- ▶ Denies abdominal pain, reports some nausea
- ▶ Has been on same ART for past 10 years (but only fully compliant for past 6 months)
- ▶ no recent changes to medications except for antibiotics for recent diagnosis of septic arthritis.
- ▶ Was sent to ER for further evaluation

Past Medical History

1. HIV/AIDS (acquired HIV through sexual transmission ~20 years ago)
2. Psoriasis
3. Septic Arthritis of Right Ankle—(dx 3 weeks go, on Abx)

Prior to Admission Medications

Ceftriaxone 2g IV q24 hours
Vancomycin 1,250 mg bid
Vicodin prn
Combivir 150–300 mg bid
Kaletra 200–50 mg bid
Bactrim SS 1 tab MWF
Triamcinolone topical tid

SOCIAL HISTORY:

Patient is self-employed
–former contractor.
–Married, with two children.
–Denies alcohol, tobacco, or illicit drug use.

FAMILY HISTORY:

Mother–Type 2 DM(Dx in 50's)
Brother–Type 2 DM (Dx in 30's)
–Patient does not speak to family, but does not believe mother was on insulin.
–Unsure of brother's insulin use.

ALLERGIES: NKDA

Review of Systems

- ▶ Constitutional: Negative for fevers, chills, night sweats, weight loss, heat/cold intolerance
- ▶ HEENT: Negative for headaches, + blurry vision. Negative for double vision, tinnitus, rhinorrhea, sore throat
- ▶ Respiratory: Negative for cough, wheezing
- ▶ Cardiovascular: Negative for chest pain, shortness of breath, lightheadedness, palpitations
- ▶ Gastrointestinal: Negative for abdominal pain, nausea, vomiting, diarrhea, constipation
- ▶ Genitourinary: + Increased urinary frequency
- ▶ Skin: Negative for diaphoresis
- ▶ Neurological: Negative for weakness, numbness, tingling
- ▶ Psychiatric/Behavioral: Negative for anxiety, depression, psychomotor retardation

Physical Examination

VS: 97 °F HR 90 BP 128/92 RR 18 O2sat-97% on RA Wt-86.9kg/191lbs
Height- 5'11" BMI=27

Constitutional: He is oriented to person, place, and time. He appears well-developed and well-nourished.

Head: Normocephalic and atraumatic.

Eyes: Eomi

Neck: supple, no thyromegaly

Cardiovascular: Normal rate and regular rhythm.

Pulmonary/Chest: CTA b/l

Abdominal: +abdominal obesity. No tenderness to palpation.

Musculoskeletal:

Right ankle-Good ROM but has some pain with movement. Mild Swelling. Able to stand and ambulate without difficulty.

Neurological: He is alert and oriented to person, place, and time.

Skin: Skin is warm and dry. No acanthosis nigricans. +Psoriasis

Psychiatric: He has a normal mood and affect.

LABS

122 | 88 | 18 / 544

4.3 | 21 | 1.0 \

AST -14

Tbili 0.3

ALT-15

Tprotein 8.4

Alk Phos 83 Albumin 3.7

B-OH butyrate: 0.29 (<0.3 mmol/L)

HbA1c: 9.5

12.7 \ 11.8 / 326

/ 34.9 \

HIV and Diabetes

- ▶ **Protease Inhibitors (PI)**
 - Increase insulin resistance
 - Interfere with GLUT-4 mediated glucose transport
 - Inhibit PPAR- γ , promoting adipocyte inflammation, release of FFA, and insulin resistance
- ▶ **Nucleoside Reverse Transcriptase Inhibitors (NRTI)**
 - Proposed mechanisms include increased insulin resistance, mitochondrial dysfunction, lipodystrophy (increased visceral fat with wasting of subcutaneous fat \rightarrow higher levels of TNF α , CRP \rightarrow insulin resistance).
- ▶ **Other Medications**
 - Pentamidine (treatment for *P. carinii* pneumonia) causes β -cell toxicity, with acute hypoglycemia followed by diabetes.

Oral Diabetes Medications and HIV

▶ Metformin

- May not be tolerated by cachectic pts, and is likely to cause diarrhea
- Should not be combined with Stavudine, which also increases the risk of lactic acidosis
- Avoid in pts with TB, weight loss, and cachexia

▶ Insulin secretagogues (SU, glinides)

- Safe, but may not be effective in severe insulin resistance

▶ Thiazoladinediones

- May increase subcutaneous fat, which may help in pts with lipodystrophy
- Randomized controlled trials have shown poor response
- Contraindicated in hepatic dysfunction and heart failure
- Use generally avoided unless other medications not tolerated

Treatment of DM2 and HIV

▶ DPP-IV inhibitors

- Not well studied in the setting of HIV
- Theoretical risk of immunodeficiency and exacerbation of infections

▶ GLP-1 analogs

- Not well studied in HIV
- Case study showing weight loss, as well as improved insulin sensitivity and β -cell function in one patient on Byetta
- Possible option if weight loss required and GI effects tolerable

▶ Insulin

- Drug of choice for DM2 in HIV
- Has an anabolic effect, does not interact with anti-retroviral medications, and is not contraindicated in renal or hepatic dysfunction
- Should be initiated on diagnosis

HIV and Screening for Diabetes

- ▶ Patients with HIV should be screened for diabetes at diagnosis, at the onset of ART therapy, and at three to six month intervals after ART.
- ▶ A1c is not recommended as a screening test.
- ▶ Fasting blood glucoses, random blood glucoses, or an oral glucose tolerance test may be performed as screening measures.

Hospital Course

- ▶ Started on Lantus/Novolog regimen.
- ▶ Seen by DM educator for glucometer use, insulin teaching, and diet education.
- ▶ Insulin titrated while in the hospital.
- ▶ Discharged home with outpatient f/u.

Take Home Points

1. Usage of ART in HIV patients increases risk of development of diabetes.
2. Patients with HIV should be screened for diabetes at diagnosis, at the onset of ART therapy, and at three to six month intervals after ART.
2. Insulin is the drug of choice for treatment of diabetes in an HIV patient.

References

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