Refractory Hypoglycemia in a Patient with AIDS

Puneet Ghotra, MD – Nargiz Munganlinskaya, MD
MedStar Health Internal Medicine
Baltimore, MD
Case Presentation - HPI

• 62-year-old female with AIDS (CD4 70) not on HAART and hepatitis C presented with diarrhea for 2 months.

• ROS: No F/C/V. Weight loss over several months. Fatigue. Dyspnea on exertion. Mild abdominal discomfort. Diarrhea – nonbloody, 9-10 BM/day.
Case Presentation – Hx

- Past medical hx: HIV not on HAART, HCV – untreated, recent B/L PNA
- Past surgical hx: TAH/RSO
- Home meds: Aspirin 81mg qd, methadone 50mg qd, multivitamin
- Allergies: None
- Family hx: Noncontributory
Case Presentation – EMS arrival at home

Vitals:
• Afebrile
• BP – 126/82
• HR – 98
• RR – 18
• SaO2 – 70%, room air
• Fingerstick blood glucose – 100 mg/dL
Case Presentation – Arrival to MFSH

Vitals:
• Afebrile
• BP – 106/82
• HR – 74
• RR – 18
• SaO2 – 90-92% on 4L/min NC
Case Presentation – Physical Examination

• Chronically ill-appearing, frail/elderly
• BMI 15 kg/m²
• Increased AP chest diameter
• Coarse breath sounds without any wheezing, diminished air movement in the bibasilar areas with rhonchi
• Cyanotic fingernails
Case Presentation – Initial Workup

Admission, day 1:

• K 2.5
• BUN/Cr 24/0.76, GFR>60
• Glucose 58
• LFTS:
  • TP 6.3, globulin 5.1 (H, 1.3-4.7), Total bili 0.6, Bili direct 0.35 (H, 0-0.3), AST 43, ALT 21, Albumin 1.2
• ALP 132
• Lipase 39
• ABG, on 4L/min NC: pH 7.46/pCO2 35/pO2 80/HCO3 25
• CT Abd/Pelvis: Fatty liver. Questionable bowel wall thickening. Intra/extrahepatic biliary tree dilation that extends to ampulla where there is no mass lesion. Pancreas, spleen, adrenal glands, kidneys normal.
• Chest X-ray: Diffuse interstitial process as noted. Edema versus a diffuse pneumonitis are considerations.
Case Presentation – Initial management

- TMP-SMX double-strength 2 tabs TID
- Prednisone 40 mg BID
- Stool studies sent: Cdiff, O+P, cryptosporidium, isospora, cyclospora, giardia

- Azithromycin 1200mg weekly for MAI prophylaxis
Case Presentation – Hospital Course

• Stool testing confirmed cryptosporidiosis. Diarrhea was managed supportively and did not persist beyond day 2 of hospitalization.
  • Crypto infection is predominantly associated with diarrhea and biliary tract disease – ALP, bili

• Day 3: Confirmation of PCP by BAL

• Worsening SaO2
  • ABG, on 6L/min NC: pH 7.47/pCO2 29/pO2 57/HCO3 20/6 (BD -2.2)
  • HFNC FiO2 70% at 35L/min

• Day 4: REFRACTORY HYPOGLYCEMIA
Case Presentation – Refractory Hypoglycemia
Case Presentation - Workup for hypoglycemia

- Drugs: Bactrim (rare)
- Critical illness, malnourishment
- Hormone deficiency: Cortisol nl
- Endogenous or exogenous hyperinsulinism:
  - C-peptide level: 7.78 ng/mL (NL: 0.8-3.1 ng/mL)
### Drugs other than antihyperglycemic agents and alcohol reported to cause hypoglycemia

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<thead>
<tr>
<th>Moderate quality of evidence</th>
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<tr>
<td>Oxprenolol</td>
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<td>Glitazones</td>
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<td>Pentamidine</td>
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<td>Quinine</td>
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<td>Indomethacin</td>
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<td>Glucagon (during endoscopy)</td>
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<tr>
<td>Chloroquine and sulfonamides</td>
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<tr>
<td>Artezolizumab/antimycin/antemser</td>
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<td>HG-1</td>
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<td>Lithium</td>
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<td>Propoxyphene/desopropoxyphene</td>
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<td>Drugs with &gt;25 cases of hypoglycemia identified</td>
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<tr>
<td>Angiotension-converting enzyme inhibitors</td>
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<td>Angiotension receptor antagonals</td>
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<td>Beta-adrenergic receptor antagonals</td>
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<td>Laudixox (I)</td>
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<td>Mifepristone</td>
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<td>Disopyramide</td>
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<td>Trimethoprim-sulfamethoxazole</td>
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<td>Heparin</td>
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<td>6-Mercaptopurine</td>
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HG-1: insulin-like growth factor 1.
Case Presentation – Refractory Hypoglycemia

- TMP-SMX -> Clindamycin, primaquine
- Normoglycemia is achieved (w/o any supplemental dextrose) 24 hours following the last administered dose of TMP-SMX. ½ life of SMX is 9-12 hours.
Discussion – [Trimethoprim-sulfamethoxazole]-induced hypoglycemia in a nondiabetic patient with aids & normal renal function

• [TMP-SMX]-induced hypoglycemia reported with concomitant use of sulfonylureas or meglitinides in diabetic patients and/or in patients with renal insufficiency – rare.

• Chemical similarities between SMX and sulfonylureas may cause cross-reactivity, resulting in a sulfonylurea-like effect associated with TMP-SMX.

• Our patient on TMP-SMX -> C-peptide level elevated at 7.78 ng/mL (normal: 0.8-3.1 ng/mL) -> hypoglycemia was due to increased endogenous insulin secretion.
Discussion – [Trimethoprim-sulfamethoxazole]-induced hypoglycemia in a nondiabetic patient with aids & normal renal function

• Case reports of hypoglycemia following TMP-SMX administration in nondiabetic patients or those without renal insufficiency - extremely rare.

• Our patient was not diabetic and had normal renal function but was significantly malnourished and glycogen-deficient in the setting of AIDS.

• Then understandably, stimulants of insulin secretion in such patients can have catastrophic consequences.
Take Home Points...

• Avoid stimulants of insulin secretion in patients who are malnourished

• Monitor patients who are started on TMP-SMX for hypoglycemia if:
  • Diabetic patients on sulfonylureas or meglitinides
  • Patients with renal impairment
  • Patients with malnutrition
THANK YOU FOR LISTENING. QUESTIONS?