A Tale of 2 Women: 51 yo F and 61 yo females admitted with hypoglycemia

Jess Hwang, MD
Endocrinology fellow
5/8/14
51 year old non-diabetic female
Had episode of loss of consciousness (LOC) at home on New Years Day
Paramedics → critical low BS, given D50 x 1 amp
Mental status improved with this
No history of past episodes, seizures, LOC in the past
She has no history of diabetes
No diabetes or autoimmune disease in family
No nausea, vomiting, fevers, chills
In the ED, she became acutely confused, diaphoretic and was again found to have a blood glucose of <30 mg/dL so was given another amp of dextrose and was started on IVF w/ dextrose.

- Endorsed not eating well the last week and having one alcoholic beverage at a New Year’s Eve party.
- History of heroin abuse in the past but is in a methadone program and reports abstinence
- Admitted to the intensive care unit for monitoring
Past Medical History
ADHD
Heroin addiction (past)

Social History
Smokes half pack/day
Smokes marijuana daily

Family History
Paternal grandfather: Heart Disease
Paternal grandmother: Blood Clots
Brother: Depression/Anxiety

Medications
Methadone 20 mg daily
15 minutes later…

- Paged by same ICU resident saying....

  “Remember that last lady we just spoke about, I am basically calling the exact same consult on someone else …”
61 year old admitted with altered mental status and found to have severe hypoglycemia.

Snorted heroin, smoked cocaine and consumed substantial alcohol 1 day prior to admission on NYE.

No history of weight loss, appetite change, seizures, nausea or vomiting.

Has never been on anti-hyperglycemic agents.

2 prior episodes of hypoglycemia in the past requiring hospitalization, she did not know the trigger.
SL - Other Past Medical History

- **Past Medical History**
  - Asthma
  - Heroin/Cocaine addiction

- **Social History**
  - Smokes a pack every 5 days
  - Drinks 2-3 shots of gin/3-4 beers daily
  - Snorts heroin/smokes cocaine

- **Family History**
  - No history of diabetes
  - No history of hypoglycemia

- **Medications**
  - Albuterol
  - Symbicort
  - Amlodipine
Since both of these women were seen and examined consecutively the next morning I will just present their data next to each other for comparison sake.
Review of systems

**SB**
- **GENERAL:** 10 lb unintentional weight loss. No fevers or chills.
- **HEENT:** Normal vision.
- **CV:** No chest pain, no palpitations.
- **Pulm:** No dyspnea.
- **GI:** No N/V/D/C/ab pain.
- **MSK:** No joint pain.
- **Skin:** No rash.
- **Neuro:** No headaches.
- **Endo:** Hypoglycemia.
- **Psych:** history of substance abuse- in remission.

**SL**
- **GENERAL:** No weight loss. No fevers or chills.
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- **Neuro:** No headaches.
- **Endo:** Hypoglycemia- 2 prior episodes.
- **Psych:** history of substance abuse.
## Physical Exam

### SB
- **35.8, 72, 105/59, 98%, BMI 20.25**
- **Gen:** no distress
- **HEENT:** no pharyngeal erythema. Normal VF. PERRLA.
- **Neck:** no thyromegaly, no nodules.
- **CV:** regular rate and rhythm.
- **Pulm:** clear to auscultation
- **GI:** soft, non-tender/non-distended abdomen.
- **MSK:** normal range of motion.
- **Neuro:** alert and oriented
- **Psych:** normal mood.

### SL
- **36.0, 82, 131/82, 22, 99%, BMI 19.7**
- **Gen:** no distress
- **HEENT:** no pharyngeal erythema.
- **Neck:** no thyromegaly, no nodules.
- **CV:** regular rate and rhythm.
- **Pulm:** clear to auscultation
- **GI:** soft, non-tender/non-distended abdomen.
- **MSK:** normal range of motion.
- **Neuro:** alert and oriented
- **Psych:** normal mood.
# Initial Labs

<table>
<thead>
<tr>
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<th>SL</th>
</tr>
</thead>
<tbody>
<tr>
<td>135</td>
<td>141</td>
</tr>
<tr>
<td>104</td>
<td>107</td>
</tr>
<tr>
<td>13</td>
<td>21</td>
</tr>
<tr>
<td>3.7</td>
<td>6.9</td>
</tr>
<tr>
<td>24</td>
<td>4.0</td>
</tr>
<tr>
<td>1.2</td>
<td>25</td>
</tr>
<tr>
<td>Ca 8.5</td>
<td>0.9</td>
</tr>
<tr>
<td>Phos 2.6</td>
<td>31</td>
</tr>
<tr>
<td>Mg 2.1</td>
<td>Ca 9.0</td>
</tr>
<tr>
<td>5.5</td>
<td>6.9</td>
</tr>
<tr>
<td>3.1</td>
<td>4.0</td>
</tr>
<tr>
<td>0.4</td>
<td>0.1</td>
</tr>
<tr>
<td>44</td>
<td>57</td>
</tr>
<tr>
<td>0.4</td>
<td>33</td>
</tr>
<tr>
<td>44</td>
<td>16</td>
</tr>
<tr>
<td>60</td>
<td>33</td>
</tr>
<tr>
<td>30</td>
<td>16</td>
</tr>
</tbody>
</table>
Differential Diagnosis Hypoglycemia

- Ill or Medicated
  - Drugs: insulin, insulin secretagogues, EtOH
  - Critical illness: hepatic/renal/cardiac failure, sepsis
  - Hormone deficiency: cortisol, glucagon/EPI
  - Non-islet cell tumor

- Seemingly well
  - Endogenous hyperinsulinism
    - Insulinoma
    - Functional B-cell disorder (nesidioblastosis, post-RYGB)
    - Insulin antibody-mediated
    - Insulin secretagogue
  - Accidental/surreptitious

Endocrine Society: Hypoglycemia Guidelines. JCEM, March 2009, 94(3): 709-728
Fasting Hypoglycemia
- Drugs- insulin, insulin secretagogues, EtOH
- Critical illness- hepatic/renal/cardiac failure, sepsis
- Hormone deficiency- cortisol, glucagon/EPI
- Non-islet cell tumor
- Disorders of infancy- congenital hyperinsulinism, enzyme deficiencies

Reactive Hypoglycemia
- Endogenous hyperinsulinism
  - Insulinoma
  - Functional B-cell disorder (nesidioblastosis, post-RYGB)
  - Insulin antibody-mediated
  - Insulin secretagogue
- Hereditary fructose intolerance, galactosemia
- Accidental/surreptitious
In cases of unknown etiology, this should distinguish hypoglycemia caused by endogenous (or exogenous) insulin use from other mechanisms.

- Plasma glucose, insulin, c-peptide, proinsulin, B-hydroxybutyrate, cortisol, insulin antibodies, sulfonylurea screen
Clinical Questions

- Review algorithm for hypoglycemia in non-DM
Critical diagnostic findings when glucose < 55 mg/dL

- Insulin 3 U/mL (18 pmol/L)
- Cpeptide 0.6 ng/mL
- Proinsulin 5 pmol/L
## Critical Labs

<table>
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<th>Case 2: SL</th>
</tr>
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<tr>
<td>Serum Glucose (60-109 mg/dL)</td>
<td>37</td>
<td>31</td>
</tr>
<tr>
<td>Insulin (&lt;28.5 uIU/mL) ➔ (&lt;3.0)</td>
<td>57.1</td>
<td>22.1</td>
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<tr>
<td>C-peptide (0.3-2.3 pmol/mL) ➔ (&lt;0.6)</td>
<td>1.58</td>
<td>1.23</td>
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<tr>
<td>Proinsulin (3-20 pmol/L) ➔ (&lt;5.0)</td>
<td>39</td>
<td>78</td>
</tr>
<tr>
<td>Insulin Ab (0.00-0.02 nmol/L)</td>
<td>Negative</td>
<td>Negative</td>
</tr>
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<td>23.2</td>
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<td>HbA1c (3.9-6.1%)</td>
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<td>+ for opiates</td>
<td>+ for opiates, + for cocaine</td>
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Further history

- Asked SL if anyone else from the party became sick with similar symptoms, she endorsed that her neighbor (SB) was also admitted to a hospital with the same symptoms. *(She had no idea which one)*
- BOTH of them had snorted heroin that was laced with other medications on NYE, no IV drug use.
- The person who sold them the heroin admitted to cutting the drug with what was thought to be “Dormin” an over the counter sleep-aid containing Benadryl
- Anecdotally helps to reduce withdrawal symptoms.
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<td>+ for Glipizide</td>
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Neither required treatment with octreotide or glucagon. After 24 hours in the MICU neither subject had another episode of hypoglycemia.

Diagnosis: hypoglycemia induced by snorting heroin contaminated with glipizide.

Both women were informed of their test results. SB had incidental hypocortisolemia, further work-up revealed concomitant secondary adrenal insufficiency.
SB- Pituitary Assessment

- Cortisol 1.0 (ACTH 5.4), 2.8 (7.6) on repeat
  - Cosyntropin stim was attempted but there was a problem with the timing in relation to her last dose of hydrocortisone
- TSH of 1.08 (RR 0.3-4.0)
- Free T4 of 0.56 (RR 0.9-1.7)
- Prolactin < 1.0 ng/mL (RR 4.8-23.3)
- IGF-1 of <25 ng/mL (RR 87-238)
- FSH 4.9, LH 5.4, Estradiol 130 (perimenopause)
Denied a history of corticosteroid use and did not appear adrenally insufficient on exam.

Infused brain MRI was obtained and revealed no pituitary lesion, however, there was a 5 mm x 5 mm anterior communicating artery aneurysm causing mass effect on the optic chiasm thought to be contributing to hypopituitarism.

Patient endorsed being told she had a brain aneurysm at 4 yo. Never followed up because she didn’t have symptoms.
Discharge plan

- Neurointerventional radiology service saw her and discussed 3 options- conservative management, endovascular surgery and open surgical clipping.

- Discharge medications
  - Hydrocortisone 20 mg/10 mg daily
  - Levothyroxine 50 mcg daily

- Recommended she have her pituitary labs re-drawn in 2 weeks after holding her PM dose of hydrocortisone but unfortunately after she was discharged she has not been contact-able.
Clinical Questions

- Review algorithm for hypoglycemia in non-DM
- Should we be worried about a new epidemic?
“Cheese”: New Face of Heroin

Black Tar Heroin + Tylenol PM or generic = “Cheese”

Enhance illicit drug effect
More conducive for snorting
Increase profits by increasing volume of drug sold
57 yo non-diabetic man with a history of benzodiazepine abuse who was unresponsive after a witnessed collapse.
- Fingerstick glucose of 41 mg/dL. 1 amp of D50 and 1 mg glucagon were given.
- Urine drug screen was positive for cocaine, benzodiazepines, opiates, and methadone.

48 yo non-diabetic woman found unresponsive.
- Unmeasurable “low” fingerstick glucose. After one amp of D50 and 2 mg naloxone, GCS improved to 7, repeat fingerstick glucose was 68 mg/dL.
- She endorsed ingesting 2 tablets of “street Valium.”
- Urine drug screen and serum alcohol were negative.

Hypoglycemic effect of sulfonylureas mimics clinical sedation achieved with benzos.
Clinical Questions

- Review algorithm for hypoglycemia in non-DM
- Should we be worried about a new epidemic?
- Have there been other cases of SU poisoning by inhalation?
Hypoglycaemia by Inhalation

SIR—Drug poisoning can happen in unexpected ways. A 33-year-old man was brought to the emergency room in coma. He had previously been well, except for chronic otitis media. The day before admission he developed an unsteady gait with slight alterations in mood and behaviour. He was taken to another hospital where a diagnosis of vertigo due to otitis media was made, and he was discharged on oral antibiotics. The next morning the patient could not be roused. In the emergency room he appeared deeply comatose; his eyes were closed and he did not react to noxious stimuli. Plantar cutaneous reflexes were abnormal, pupils were equal and reacted slowly to light. Temperature was normal, blood pressure was 120/80 mm Hg, heart rate 100 beats per min, and respiratory rate 10 per min. Blood glucose, measured as part of a routine, was 1·3 mmol/L. 50 mL of glucose 33% was given, with slight improvement in the neurological picture. There was no personal or family history of diabetes and the relatives denied any access to hypoglycaemic drugs. The patient had never had psychiatric problems or previous admissions for the same symptoms, making the diagnosis of Munchausen’s syndrome unlikely. The patient recovered but needed further glucose infusions for recurring hypoglycaemia and remained somewhat confused for the next 48 h. An electroencephalogram showed subcortical non-specific alterations. Computed tomography (CT) of the head was normal. Plasma insulin levels were normal. Pancreatic echography and CT scan were also normal. Further information about the patient was sought. He worked at a pharmaceutical firm processing chlorothalidone and nifed-
Obtaining the Critical sample

We can now add on to hypoglycemia labs to any Mint Green or Red top tube

- Insulin
- C-Peptide
- Beta-hydroxybutyrate
- Cortisol

Can NOT add on Proinsulin.
Call 773-702-1318 (Dr Leung with ?s/problems)
Take Home Points

- Importance of the critical sample—how to obtain this sample retroactively
- Hypoglycemia might be multifactorial
- History is critical in these cases


