Diagnostic dilemma of an unresponsive patient

NEIL BRUMMOND, M.D.
AVERA MEDICAL GROUP - INTERNAL MEDICINE
SIOUX FALLS, SD
CME Objective

- Be able to evaluate a patient that is unresponsive with a pulse
79 YEAR OLD FEMALE

- Patient found unresponsive in her home by family
- EMS contacted and she had a pulse when they arrived. No CPR administered by family
- PMH: Hypertension, history of TIA’s
- Medications: Amlodipine, HCTZ, Lisinopril, Aspirin
EMS EVALUATION

- Initial Vitals: BP 110/70, Pulse regular at 95
- Gen: Patient unresponsive on floor without signs of trauma or evidence of incontinence
- Pupils: normal in appearance and reactive to light
- Heart: RRR without murmurs, rubs, gallops
- Lungs: Clear
- Abdomen: Soft
- Extremities: No edema
What is your differential for an unresponsive patient with a pulse?

- Hypotension
- Syncope
- Seizure
- Stroke
- Hypoglycemia
- Overdose (Drugs/Alcohol)
- Encephalopathy
- Infection
CASE CONTINUED

• Blood glucose 45, treated and symptoms improved
• Brought to hospital for evaluation
• Initial exam on arrival was normal. No focal deficits.
• Patient started to become altered and somnolent again. Repeat glucose 54. Patient placed on D5 and later D10
Hypoglycemia Survey:
- Glucose 54
- C-Peptide 2.2 (N)
- Insulin 9.2 (N)
- Pro-insulin 26 (H)
- beta-hydroxybutyrate 0.1 (N)
- Insulin Antibody negative
- Sulfonylurea survey negative

CT abdomen obtained
Triple Phase Pancreatic CT Scan
CT ABDOMEN READ

- 9 mm mass in pancreas

- Working diagnosis: Insulinoma
**DIAGNOSIS OF INSULINOMA**

**Hypoglycemia: Interpretation of 72-hour fast**

<table>
<thead>
<tr>
<th>Symptoms, signs, or both</th>
<th>Glucose (mg/dL)/(mmol/L)</th>
<th>Insulin (microU/mL)/pmol/L</th>
<th>C-peptide (nmol/L)/(ng/mL)</th>
<th>Proinsulin (pmol/L)</th>
<th>Beta-hydroxybutyrate (mmol/L)</th>
<th>Glucose increase after glucagon (mg/dL)/(mmol/L)</th>
<th>Circulating oral hypoglycemic agent</th>
<th>Antibody to insulin</th>
<th>Diagnostic interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>&lt;55/3</td>
<td>&lt;3/20.8</td>
<td>&lt;0.2/0.6</td>
<td>&lt;5</td>
<td>&gt;2.7</td>
<td>&lt;25/1.4</td>
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<td>No</td>
<td>Normal</td>
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<tr>
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<td>&lt;55</td>
<td>&gt;&gt;3</td>
<td>&lt;0.2</td>
<td>&lt;5</td>
<td>≤2.7</td>
<td>&gt;25</td>
<td>No</td>
<td>Neg (Pos)</td>
<td>Exogenous insulin</td>
</tr>
<tr>
<td>Yes</td>
<td>&lt;55</td>
<td>≥3</td>
<td>≥0.2</td>
<td>≥5</td>
<td>≤2.7</td>
<td>&gt;25</td>
<td>No</td>
<td>Neg</td>
<td>Insulinoma, NPHS, PGBH</td>
</tr>
<tr>
<td>Yes</td>
<td>&lt;55</td>
<td>≥3</td>
<td>≥0.2</td>
<td>≥5</td>
<td>≤2.7</td>
<td>&gt;25</td>
<td>Yes</td>
<td>Neg</td>
<td>Oral hypoglycemic agent</td>
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<td>Yes</td>
<td>&lt;55</td>
<td>&gt;&gt;3</td>
<td>&gt;&gt;0.2*</td>
<td>&gt;&gt;5*</td>
<td>≤2.7</td>
<td>&gt;25</td>
<td>No</td>
<td>Pos</td>
<td>Insulin autoimmune</td>
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<td>No</td>
<td>Neg</td>
<td>IGF-1</td>
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<td>&lt;5</td>
<td>&gt;2.7</td>
<td>&lt;25</td>
<td>No</td>
<td>Neg</td>
<td>Not insulin (or IGF-1-mediated)</td>
</tr>
</tbody>
</table>

Patterns of findings during fasting or after a mixed meal in normal individuals with no symptoms or signs despite relatively low plasma glucose concentrations (i.e., Whipple's triad not documented) and in individuals with hyperinsulinemic (or IGF-mediated) hypoglycemia or hypoglycemia caused by other mechanisms.

Neg: negative; Pos: positive; PGBH: post gastric bypass hypoglycemia; NPHS: noninsulinoma pancreatic hypoglycemia syndrome; IGF: insulin-like growth factor.

* Free C-peptide and proinsulin concentrations are low.

* Increased pro-(IGF-I), free IGF-II, IGF-II/IGF-I ratio.

General surgery consulted and removed mass
Pathology Report: Islet cell tumor (clinically insulinoma) forming a 0.9 x 0.9 x 0.7 cm mass.
No further hypoglycemia after operation
Insulinoma

- Incidence: 0.4 per 100,000 person years
- Mean age 50 and 57% female
- Median duration of symptoms prior to diagnosis: 1.5 years
- 20% misdiagnosed with neuro or psych disorder
Questions?
A patient presents with hypoglycemia with a blood sugar of 50. Labs done on arrival reveal a low C-peptide, an elevated insulin level, and a low pro-insulin level. What is the most likely etiology to the patient’s low blood sugar?

1. Insulinoma
2. Oral hypoglycemic agent
3. Exogenous insulin
4. Autoimmune etiology
What is the best way to evaluate a patient with recurrent hypoglycemia without a known cause?

1. 72-hour fast
2. CT abdomen and pelvis
3. Hypoglycemia panel
4. Arterial calcium stimulation
Service, F, Vella, A; Hypoglycemia in adults without diabetes mellitus: Diagnostic approach; In: UpToDate, 2017