The Best of Morning Report

University of Maryland Medical Center Midtown Campus

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• Formerly known as Maryland General Hospital
• 36 hard-working residents (p < .10)
Chief Complaint

• 32 year old man brought to medical care by his girlfriend

• She claimed that, "he was acting like he was drunk all the time."
HPI from Girlfriend

• Relationship began 6-8 months ago
• She began to be concerned about his regular alcohol use
• He agreed to stop completely one month ago
• Episodes of difficulty with gait, slurred speech, memory lapses, and smell of alcohol
• He staunchly denies any alcohol use
HPI from Girlfriend, Continued

- She brought him to ER in Glen Burnie two weeks ago, where alcohol level was positive.
- Girlfriend did research on internet and thought the patient might have Auto-Brewery Syndrome
- She brought him to office of a gastroenterologist, who referred the patient to hospital for admission
- On the night prior to admission, the girlfriend noted no smell of alcohol on his breath when he went to sleep. But there was alcohol on his breath at 3 AM when she awoke to check on him
History from the Patient

• Two years ago, he began to have early AM insomnia with daytime fatigue, lethargy, and irritability
• Took afternoon naps
• Very irritable if awoken from sleep
• Tried to eliminate starch from his diet
• Arguments with GF for waking him from sleep, and he would not remember afterwards
• Moody, lightheaded
Past Medical History

- Migraine Headaches - frequent. Usually takes acetaminophen PRN. Worse in AM upon rising from bed
- Smokes 1 PPD for past 10 years. Also smokes marijuana. No illicit drug use
- Drank beer and liquor socially, once every 2-3 weeks. Started at age 19. None in the past month
- Takes him 8-10 beers or 6 mixed drinks to become intoxicated
- Works in automobile repair and maintenance. Has a college degree. No accidents at work, no MVA’s
Past Medical History

• Medications: sumitriptan, acetaminophen, Immodium, Gas-Ex (all PRN)
• NKDA
• FHx: Noncontributory
• ROS:
  • Excessive thirst: drinks 3-4 large cups of water a day
  • Diarrhea stools 2-3 times a week
  • No BRBPR or melena
  • Chronic bloating and excessive flatus throughout the day
  • No weight loss
Physical Examination

- Vital Signs: T 99.4 F, BP 135/68, P 79, R 16
- Moist mucous membranes, normal skin turgor. Not diaphoretic. No smell of alcohol
- Non-icteric, no asterixis, no spider angiomas
- No thyroidomegaly, hepatosplenomegaly, LN’s
- Abdomen: soft, +BS, no masses, ascites. He was tender to deep palpation
- Rectal Exam: normal tone, no stool in rectal vault, no masses
- Neuro Exam: No tremor. Normal strength, reflexes, sensation, and cerebellar testing
A. Order a blood alcohol level, routine labs, and the requisite radiological studies
B. Test stool for bacterial culture and parasites
C. See if any of his medications are on the Beers list
D. Tell the girlfriend to dump him
E. Offer the girlfriend a position in your residency program
## Laboratory Tests

<table>
<thead>
<tr>
<th>Sodium</th>
<th>Potassium</th>
<th>Chloride</th>
<th>CO2</th>
<th>Glucose</th>
<th>BUN</th>
<th>Creatinine</th>
<th>Calcium</th>
</tr>
</thead>
<tbody>
<tr>
<td>142</td>
<td>3.5</td>
<td>104</td>
<td>28</td>
<td>72</td>
<td>10</td>
<td>0.78</td>
<td>8.4</td>
</tr>
<tr>
<td>137-145 mmol/L</td>
<td>3.5-5.1 mmol/L</td>
<td>98-107 mmol/L</td>
<td>22-30 mmol/L</td>
<td>65-140 mg/dL</td>
<td>9-20 mg/dL</td>
<td>0.66-1.5 mg/dL</td>
<td>8.4-10.2 mg/dL</td>
</tr>
</tbody>
</table>

**Urine toxicology screen:**
- Cannabinoids: Positive
- Vitamin B12: 445
- Folate: 4.1
- Vitamin B1:
  - MCV: 104
  - MCH: 34.1
Next Step: Research on Auto-Brewery Syndrome

- Rare condition!
- Due to overgrowth of yeast in GI tract: *Saccharomyces cerevisiae, Candida albicans, Candida krusei, Candida kefyr, and Candida glabrata*
- Consumption of carbohydrates leads to fermentation into ethanol in gut
- Signs of alcohol intoxication are present without ingestion of alcohol
Interventions during Hospitalization

- 9-hour observation period with sitter
- All possessions were inspected
- Obtain serum glucose and BAL for baseline
- Initiate thiamine 100 mg IV TID
- Administer 50 gm oral glucose challenge
- Monitor serum alcohol level Q2 hours, and serum glucose Q4 hours

## Laboratory Results

<table>
<thead>
<tr>
<th>TIME</th>
<th>Blood Alcohol Level (mg/dL)</th>
<th>Serum Glucose</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:40 AM (baseline)</td>
<td>118</td>
<td>72</td>
</tr>
<tr>
<td>11:40 AM</td>
<td>67</td>
<td></td>
</tr>
<tr>
<td>1:40 PM</td>
<td>12</td>
<td>142</td>
</tr>
<tr>
<td>3:40 PM</td>
<td>negative</td>
<td></td>
</tr>
<tr>
<td>5:40 PM</td>
<td>negative</td>
<td>89</td>
</tr>
</tbody>
</table>
What is the best Interpretation of these results?

A. Rare conditions are rare; common conditions are common
B. Patients with common conditions can still be educational
C. Don’t date men who drink
D. You should not believe the diagnoses that you read on the internet
E. The patient should confess his surreptitious behavior to you and to his girlfriend
Auto-Brewery Syndrome

- Iwata described 12 cases in Japan in 1972
- Called Drunkenness Disease, Endogenous Ethanol Fermentation, Gut Fermentation Syndrome, Auto-Brewery Syndrome
- 13 year girl with short gut syndrome who became intoxicated after ingesting carbohydrates
- Treatment with oral anti-fungal agents
A. May become more common with use of Brewer’s yeast (Saccharomyces cerevisiae) as a nutritional supplement

B. Five infant formulas were combined with common yeast species and incubated at 37°C. Ethanol was detected at 24 hrs. Proposed as etiology for SIDS

C. Used in defense of prosecution for drunk driving

D. DKA and candida sepsis?
References

• Iwata, “A Review of the Literature on Drunken Syndromes Due to Yeasts in the Gastrointestinal Tract,” University of Tokyo Press, Tokyo, 1972, p. 260-268
• Bivin and Heinen, “Production of Ethanol from Infant Food Formulas by Common Yeasts,” Journal of Applied Bacteriology, 1985; 58(4): 355-357