

# Intoxicated without a Drop to Drink: A Case Report of Auto-Brewery Syndrome

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## Introduction

- Auto-brewery syndrome, also known as gut fermentation syndrome, is a rarely described condition in which one's gut microbiota is altered by certain strains of yeast and bacteria that causes carbohydrates and sugars to be fermented into ethanol (1).
- High ethanol levels have been linked to high anion gap metabolic acidosis which can cause encephalopathies and psychosis (2,3.)
- We describe a previously unreported case of metabolic encephalopathy manifesting as psychosis due to auto-brewery syndrome.

## Case

- A 64 year-old Caucasian male with a history dementia, agitation, and falls presented to the emergency department (ED) for aggressive behavior at home.
- Physical exam was notable:
  - Agitation
  - Confusion
  - No nystagmus, scleral icterus, or asterixis.
- Laboratory findings:
  - Blood ethyl alcohol at 184mg/dL
  - CO2 at 17 (21-32mmol/L)
  - Anion gap of 18 (8-12mmol/L).
  - Ammonia at 50 (11-32mcg/dL).
- Patient and family denied alcohol consumption by the patient prior to admission, but did report patient was eating pizza and candy bars.

### Micro-organisms

- Candida albicans
- Candida glabrata
- Candida intermedia
- Candida parapsilosis
- Candida kefyr
- Saccharomyces cerevisiae
- Klebsiella pneumoniae
- Escherichia coli
- Streptococcus species
- Bacteroides species
- Bifidobacterium species
- Clostridium species

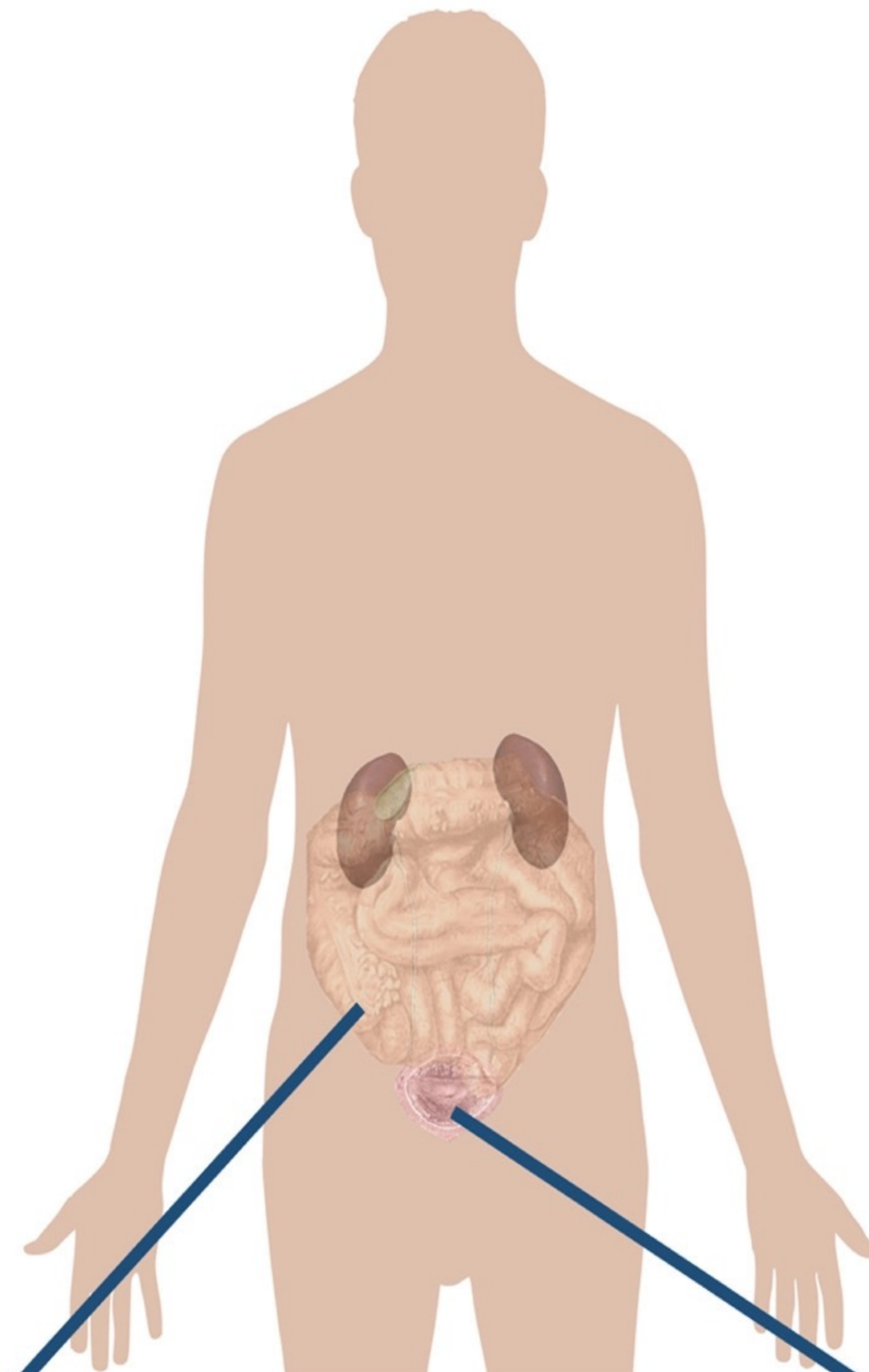
No cases found with underlined micro-organisms

### Treatments

- Low-carbohydrate diet
- Probiotics
- Fluconazol
- Nystatin
- Amphotericin B
- Antibiotics
- Fecal microbiome transplant

### Diagnostics

- History taking and physical exam (incl. neurological exam)
- Assessment of alcohol intake.
- Laboratory testing
- Blood, urinary and breath alcohol levels.
- Carbohydrate challenge test.
- Bacterial and fungal testing.
- Endoscopy



Gastrointestinal variant

Urinary variant

Suspicion of auto-brewery syndrome

Complete history and physical exam

Lab testing: CBC, CMP, ethanol level, stool testing for fungal growth

Exclude all other causes (head CT, psychiatric eval, surreptitious drinking, family history)

Provocative carbohydrate challenge testing with 200g of glucose with blood and breath alcohol testing at timed intervals of 0, ½, 1, 2, 4, 8, 16, and 24 hours

Confirmation of auto-brewery syndrome if ethanol levels are elevated during any phase of glucose challenge test

## Results

- Patient underwent carbohydrate challenges with blood alcohol concentration (BAC) testing at serial intervals which confirmed the diagnosis of auto-brewery syndrome.
- With intravenous hydration and cessation of carbohydrate consumption, the patient's anion gap closed and his metabolic encephalopathy and psychosis resolved.

## Conclusions

- The history and laboratory testing in this case confirmed the diagnosis of auto-brewery syndrome.
- The patient's psychotic symptoms resolved as his blood BAC lowered and his anion gap closed.
- Metabolic encephalopathies have been known to cause psychosis (3) and an anion gap is also known to cause metabolic encephalopathies (4).
- Treatment includes antifungal administration with concurrent use of probiotics. Intravenous antifungals are reserved for refractory cases.

## References & Acknowledgements

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