



DRUNKEN WITHOUT DRINKING

Nursing

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KEYWORDS

INTRODUCTION

Imagine a normal Sunday: you wake up, get dressed, have some coffee, and drive to church with your wife. After church at lunch, the room starts to sway, you lose coordination, and when you talk, your words are slurred. You feel like you pounded a handle of hard liquor but you haven't had a drop to drink.¹



A very rare case had come in front of Police and doctors didn't believe on a 46-year-old man who swore that he hadn't had alcohol before he was arrested on suspicion of drunken driving. They found that, His blood alcohol level was 0.2, more than twice the legal limit for operating a car. The man refused a Breathalyzer test, was hospitalized and later released. But the facts remained in contention. Then a researchers discovered the unusual truth: Fungi in the man's digestive system was turning carbohydrates into alcohol - a rarely diagnosed condition known as "auto-brewery syndrome." This condition a very rare and uncommon disease which is known as Auto-Brewery Syndrome. People with this syndrome, fermenting fungi or bacteria in the gut produce ethanol and can cause the patients to show signs of drunkenness. The condition, also known as gut fermentation syndrome, can occur in otherwise healthy people but is more common in patients with diabetes, obesity or Crohn's disease. "A person is intoxicated from this fermenting yeast, and it's a horrible illness," said by Barbara Cordell, a researcher of auto-brewery syndrome and the author of "My Gut Makes Alcohol."²

DEFINITION

Auto-brewery syndrome or gut fermentation syndrome is a condition in which ethanol is produced through endogenous fermentation by fungi or bacteria in the gastrointestinal (GI) system.³ This is sometimes called "intoxication." (Fig.1)⁴

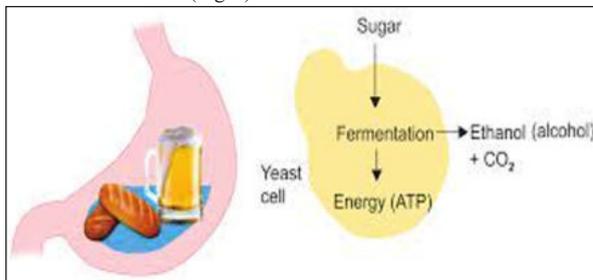


Fig 1. Digestive Tract

This rare condition can make you intoxicated without alcohol. This is when your body converts sugars and carbs (carbohydrates) into alcohol. *Saccharomyces cerevisiae*, a type of yeast, has been identified as pathogenic to this condition. Recent research has shown that *Klebsiella pneumoniae* bacteria can dissolve carbohydrates in alcohol, which can accelerate nonalcoholic fatty liver diseases. (Fig 2)^{5,6}



Fig 2. Food converts into alcohol

EPIDEMIOLOGY

Auto-brewery syndrome is a rare condition. The disease has been identified in both male and female adults and children in many countries.⁷

ETIOLOGY

In auto brewery syndrome, your body makes — "brews" — alcohol (ethanol) out of the carbohydrates you eat. This happens inside the gut or intestines. It may be caused by too much yeast in the gut. Yeast is a type of fungus.⁸

Some kinds of yeast that might cause auto brewery syndrome are:

- *Candida albicans*
- *Candida glabrata*
- *Torulopsis glabrata*
- *Candida krusei*
- *Candida kefir*
- *Saccharomyces cerevisiae* ("brewers yeast").⁸

Various yeasts from the *Candida* and *Saccharomyces* families are commensals turned pathogenic that cause auto-brewery syndrome. Two strains of bacteria are also known to ferment ethanol. Fermenting yeasts such as *Saccharomyces cerevisiae*, *S. boulardii*, and various strains of *Candida*, including *C. glabrata*, *C. albicans*, *C. kefir*, and *C. parapsilosis* are identified as causes of this condition.

PATHOLOGY

Perturbation of the gut microbiome is the underlying condition that allows fermenting microbes to over-colonize. Such gut disturbances are caused by a diet high in carbohydrates and refined foods and the overuse of antibiotic and non-antibiotic drugs in food and medicine.⁸

INDICATION

High intake of food items
Starchy foods

Carbohydrates Irritable bowel syndrome (IBS)

Some types of yeast that cause auto-brewery syndrome: *Saccharomyces cerevisiae*, *Candida albicans*, *Candida cruci*, *Candida mabrata* Auto-brewery syndrome is likely to develop to maintain medical condition.

- **In addition to**
- Chron's disease,
- Internal bacterial overgrowth,
- Diabetes,
- Obesity, and
- A weak immune system More or prolonged antibiotic use alters the gut microbiome, resulting in increased fungal growth.
- Excessive intake of carbohydrates and processed foods can also cause gastrointestinal problems.⁹

DIAGNOSIS

The following points will help to diagnosis the auto brewery syndrome:

- A doctor can diagnose auto-brewery syndrome using a combination of laboratory and observational tests.
- It is a rare condition, so a person will usually undergo testing for more common illnesses first.
- Doctors typically begin the diagnostic process by reviewing a person's medical history, asking about their current symptoms, and performing a physical examination.
- A doctor may recommend additional tests if they suspect that the person's symptoms are due to auto-brewery syndrome or another gastrointestinal disease.
- The doctor may collect a small stool sample, which they will send to a laboratory for analysis. This analysis usually involves checking for abnormal concentrations of bacteria and fungi.
- Doctors can also use a long, thin tube called an endoscope to collect fluid from different parts of the gastrointestinal tract. These samples will go to a laboratory, where people will look for bacterial or fungal overgrowth.
- Some doctors may use a carbohydrate challenge test to test for auto-brewery syndrome. They will ask the individual to eat a carbohydrate-rich meal or take a glucose (sugar) capsule on an empty stomach.
- After a few hours, they will check the person's blood alcohol level. People who do not have auto-brewery syndrome have almost undetectable blood alcohol levels. An increase in blood alcohol levels after the carbohydrate challenge test may, therefore, indicate auto-brewery syndrome.
- Doctors may run additional tests on a person's blood and urine to rule out any possible underlying conditions that could explain their symptoms.¹⁰

TREATMENT:

A coordinated treatment program should include patient input for compliance.

- **Immediate Care:** The patient with an extremely high blood alcohol level should be treated for acute alcohol poisoning and stabilized.
- **Drug therapy:** Prescribe drug therapy based on culture and sensitivity results for the identified yeast or bacteria. Most patients require a course of one or more of the azoles or polyenes. Rare or resistant microbes require an echinocandin or an antibiotic.
- **Diet therapy:** An essential treatment of auto-brewery syndrome is diet modification requiring a high protein and low carbohydrates until symptoms subside. Sugar is fermented into alcohol, and a diet that eliminates simple and complex sugars will decrease the alcohol fermented from the gastrointestinal tract.
- **Supplements:** Multistrain probiotic supplements help balance bacteria in the gastrointestinal tract and have been used in the treatment of auto-brewery syndrome but have yet to be studied as a treatment¹¹

Avoiding carbohydrates and processed foods can help relieve some symptoms of auto-brewery syndrome. People who choose to restrict their carbohydrate intake can try eating more protein to help them feel fuller for longer. People who have auto-brewery syndrome should avoid simple carbohydrates and refined foods with added sugars, such as:

- white bread
- white rice
- flour
- pasta

- pastries and desserts
- high fructose corn syrup
- sugars, including glucose, fructose, and dextrose
- sugary beverages, such as soda and fruit juice

A doctor will likely recommend that people follow a low sugar diet until their symptoms resolve. People who no longer experience symptoms can try gradually reintroducing carbohydrates to their diet.

Medication Doctors can treat auto-brewery syndrome with antifungals and, in some cases, antibiotics. Antifungals can help reduce the amount of fungus in the gut. Doctors also use these drugs to treat fungal infections that cause gastrointestinal symptoms. Antifungal drugs that people may take to treat auto-brewery syndrome include:

- fluconazole (Diflucan)
- itraconazole (Sporanox)
- nystatin (Mycostatin)
- echinocandins, such as caspofungin (Cancidas)

People who do not respond to first-line treatment may require stronger medication.

Probiotic supplements may help balance the microbiota in the gut by introducing beneficial bacteria and inhibiting fungal growth.

However, the exact role of probiotic supplementation as a treatment for auto-brewery syndrome remains unclear.¹²

CONCLUSION

Auto-brewery syndrome is a condition that occurs when the intestinal yeast produces large amounts of ethanol, which is similar to aesthetic properties. People with auto-brewery syndrome report abnormally high blood alcohol levels even when they do not drink alcohol. It is diagnosed by multiple investigations, including endoscopy and stool testing, and corrected through antifungal medications and dietary management.

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