


## Addiction

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# Ketogenic diet improves alcohol withdrawal

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Alcohol abuse carries substantial complications for the individual, even during treatment. Treating alcohol addiction is especially difficult because of alcohol withdrawal symptoms. These symptoms, both physical and emotional, make it very challenging to stop drinking. It is also very common for treated individuals to relapse, with relapsing rates of up to 60%. Benzodiazepines, commonly used for treating withdrawal symptoms, are addictive drugs. Therefore, a non-addictive alternative for the treatment of alcohol withdrawal symptoms is necessary.

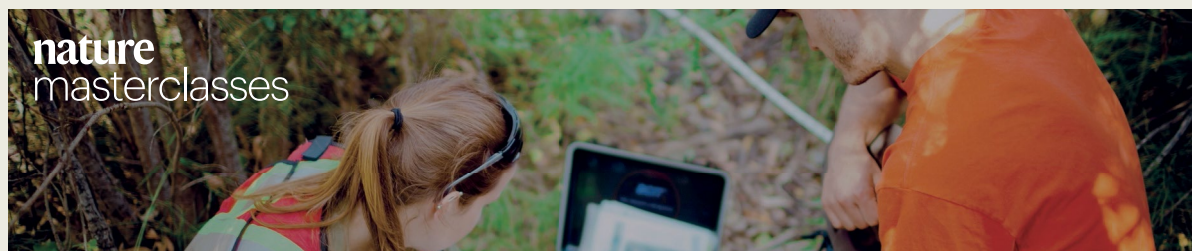
Acute and chronic alcohol intoxication alter brain metabolism, reducing and increasing glucose and acetate metabolism, respectively. Energy depletion might be the cause of the persistence of withdrawal symptoms, and providing an alternative energy source, such as ketone bodies, might improve withdrawal symptoms. A study in *Scientific Reports* shows

that inducing ketosis through diet in female C57BL/6J mice improved the symptoms of alcohol withdrawal.

By treating animals previously exposed to alcohol vapor or control air with different diets and inducing ketosis through carbohydrate restriction (ketogenic diet) or ketone supplementation, the team saw a reduction in blood glucose and cholesterol when compared to animals fed a control diet. Behaviorally, nutritional ketosis mitigated depressive-like symptoms induced by alcohol exposure, with animals showing better results on the tail-suspension test and a higher saccharin preference. Nutritional ketosis modestly reduced alcohol-induced anxiety-like symptoms, with animals on a ketogenic diet exploring more of the light area of the apparatus in a light/dark test, while administration of ketone esters had no effect. When testing ultrasonic vocalizations

associated with alcohol withdrawal, ketogenic animals vocalized less when compared with control animals. Alcohol addiction is known to dysregulate noradrenergic and serotonergic signaling. Here, exposure to alcohol lowered norepinephrine levels and showed potential to lower serotonin. Supplementation with ketone ester ameliorated the impact on serotonin levels.

This study suggests that a ketogenic diet might be a more effective approach than ketone supplementation for easing alcohol withdrawal symptoms, making it a potentially beneficial treatment. Such a therapeutic strategy would make alcohol treatment easier and potentially reduce the burden of alcohol addiction, improving the quality of life of people struggling with addiction.

**Jorge Ferreira**Original reference: Tonetto, S. et al. *Sci. Rep.* **14**, 5092 (2024)

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