Herbal drug reduces the effects of alcohol

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A photo of the tree Hovenia dulcis. Image: Wikipedia.

(Medical Xpress) -- Alcohol consumption can lead to those dreaded hangovers and even alcohol dependence. However, a new study published in the *Journal of Neuroscience* has found a natural ingredient in the Asian tree *Hovenia dulcis* that seems to produce anti-alcohol effects.

Led by Jing Liang from the University of California, researchers began looking at different herbs that have natural anti-alcohol properties. They found descriptions of anti-alcohol properties of the Asian tree Hovenia dulcis that dated back to 659. These descriptions listed it as a prime

hangover remedy.

The main ingredient in Hovenia dulcis is known as dihydromyricetin, or DHM. The team of researchers used rats to test out the effects. Rats react similar to humans when it comes to the effects of alcohol so they are a perfect candidate.

The rats were given the human equivalent of 15-20 beers in a time frame of under two hours. As expected, the rats passed out drunk and lost the ability to flip themselves over when placed on their back. Within an hour, the effects of the alcohol started to wear off and they were able to again control their bodies.

When the rats were given the same alcohol with a shot of the DHM, they still eventually lost the ability to flip over but it took a longer time period and they were able to recover from the effects in about 15 minutes.

The effects of the DHM went beyond that though. Two days after the alcohol consumption, the rats that were given the DHM showed less signs of hangover symptoms such as anxiety and seizures.

The other noted result was the reduction in addiction. When the rats were allowed to drink freely, they would gradually start consuming more. However, those rats that had received the DHM did not increase consumption.

While these results will not lead to a magic pill that will allow you to drink and not face consequences, the results do hold some promise when it comes to the treatment of alcohol addiction.

Liang and her team of researchers plan to begin testing humans and their response to the DHM.

More information: Dihydromyricetin As a Novel Anti-Alcohol Intoxication Medication, *The Journal of Neuroscience*, 4 January 2012, 32(1): 390-401; doi: 10.1523/JNEUROSCI.4639-11.2012

Abstract

Alcohol use disorders (AUDs) constitute the most common form of substance abuse. The development of AUDs involves repeated alcohol use leading to tolerance, alcohol withdrawal syndrome, and physical and psychological dependence, with loss of ability to control excessive drinking. Currently there is no effective therapeutic agent for AUDs without major side effects. Dihydromyricetin (DHM; 1 mg/kg, i.p. injection), a flavonoid component of herbal medicines, counteracted acute alcohol (EtOH) intoxication, and also withdrawal signs in rats including tolerance, increased anxiety, and seizure susceptibility; DHM greatly reduced EtOH consumption in an intermittent voluntary EtOH intake paradigm in rats. GABAA receptors (GABAARs) are major targets of acute and chronic EtOH actions on the brain. At the cellular levels, DHM (1 μM) antagonized both acute EtOH-induced potentiation of GABAARs and EtOH exposure/withdrawal-induced GABAAR plasticity, including alterations in responsiveness of extrasynaptic and postsynaptic GABAARs to acute EtOH and, most importantly, increases in GABAAR α4 subunit expression in hippocampus and cultured neurons. DHM anti-alcohol effects on both behavior and CNS neurons were antagonized by flumazenil (10 mg/kg in vivo; 10 μM in vitro), the benzodiazepine (BZ) antagonist. DHM competitively inhibited BZ-site [3H]flunitrazepam binding (IC50, 4.36 μM), suggesting DHM interaction with EtOH involves the BZ sites on GABAARs. In summary, we determined DHM anti-alcoholic effects on animal models and determined a major molecular target and cellular mechanism of DHM for counteracting alcohol intoxication and dependence. We demonstrated pharmacological properties of DHM consistent with those expected to underlie successful medical treatment of AUDs; therefore DHM is a therapeutic candidate.