

RANDOMISED CROSSOVER PILOT TRIAL

Molecular hydrogen after controlled alcohol intake

A study of breath alcohol, hangover symptoms and cognitive tests in 20 healthy adults, published in The American Journal of Clinical Nutrition (2022).

The intervention combined two hydrogen methods

Participants inhaled hydrogen-oxygen gas before drinking alcohol and then consumed hydrogen-rich water. The study cannot show whether inhalation, water or their combination produced the reported effects.

Study at a glance

20 healthy adults

A small pilot using a matched, randomised, double-blind crossover design.

Two test days

Each participant completed both conditions at least one week apart.

Hydrogen condition

One hour of hydrogen-oxygen inhalation, 100 mL of 40% liquor within 10 minutes, then hydrogen-rich water.

Placebo condition

One hour of placebo air, the same alcohol dose, then ordinary water.

What the researchers measured

Breath alcohol concentration (BrAC), self-reported hangover symptoms and cognitive-test performance, including attention and executive function.

Why crossover design helps

Because each person served as their own control, stable individual differences in alcohol metabolism were reduced as a source of bias.

MAIN RESULTS

Lower breath readings and fewer reported symptoms in this small trial

Lower

BREATH ALCOHOL

BrAC was lower at 30, 60 and 90 minutes ($P < 0.05$).

Fewer

HANGOVER SYMPTOMS

Overall symptom severity was lower ($P < 0.001$).

Higher

COGNITIVE SCORES

Attention and executive-function scores favoured hydrogen ($P < 0.05$).

Hangover symptom distribution

Hydrogen vs placebo

Reported symptoms were absent in 88.6% of hydrogen-condition ratings and 77.0% of placebo ratings. Mild, moderate and severe symptom ratings were correspondingly less frequent with hydrogen.

Examples reported in the paper

The study described lower headache, sweating, fatigue and general discomfort ratings. Symptoms were subjective and the sample was too small for reliable conclusions about individual symptoms.

Sex-related findings

Female sex was associated with higher breath alcohol readings and greater hangover severity in the study models. With only 20 participants, these subgroup findings are particularly uncertain and should not be generalised.

Lower BrAC does not mean safe or sober

Breath readings can vary and are not proof that impairment has ended. Hydrogen must never be used to justify driving, operating machinery, drinking more alcohol or ignoring symptoms of intoxication.

EVIDENCE IN CONTEXT

An interesting experiment - not a licence to drink

Key limitations

- **Only 20 participants**
This very small pilot cannot provide precise estimates, robust safety conclusions or reliable subgroup findings.
- **Combined intervention**
Hydrogen-oxygen inhalation and hydrogen-rich water were given together, so their individual contributions are unknown.
- **One controlled alcohol dose**
Results from 100 mL of 40% liquor in healthy volunteers cannot be generalised to different drinks, doses, binge drinking or alcohol dependence.
- **Breath alcohol, not blood alcohol**
The study did not directly measure blood alcohol or alcohol-metabolising enzyme activity.
- **Short-term outcomes**
The trial examined acute breath readings, symptoms and tests. It did not assess liver injury, cardiovascular harm, cancer risk or other long-term consequences.
- **Hangover relief is not harm prevention**
Feeling better does not mean alcohol-related physiological damage or impaired judgement has been prevented.

Balanced conclusion

The combined hydrogen intervention was associated with lower BrAC, fewer reported hangover symptoms and better cognitive-test scores. Independent, larger studies are required before the finding can be considered reliable or clinically useful.

Original study

Lv X, Lu Y, Ding G, et al. Hydrogen intake relieves alcohol consumption and hangover symptoms in healthy adults: a randomized and placebo-controlled crossover study. *American Journal of Clinical Nutrition*. 2022;116(5):1208-1218. DOI: 10.1093/ajcn/nqac261.

[READ THE FULL STUDY](#)

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SAFETY NOTE

No supplement, drink or gas makes alcohol consumption risk-free. The safest option is not to drink. Never drive after drinking; only time reliably lowers alcohol impairment. Seek urgent help for confusion, vomiting, slow or irregular breathing, seizures or loss of consciousness.