

Hydrogen-rich gas inhalation can alleviate exercise-induced fatigue

July 30 2024



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A new study [published](#) in the *International Journal of Sports Medicine*, titled "Inhalation of hydrogen-rich gas before acute exercise alleviates exercise fatigue," has found a possible novel intervention for exercise-induced fatigue. A cross-discipline international team of U.S. and

Chinese researchers, including at Hebrew SeniorLife's Hinda and Arthur Marcus Institute for Aging Research, has found that inhaling hydrogen-rich gas (HRG) before engaging in acute exercise can significantly reduce fatigue and enhance performance.

The research involved 24 healthy adult men who were tested for their maximum cycling power (W_{max}) and maximum cycling time (T_{max}). In a double-blind, counterbalanced, randomized and crossover design, participants inhaled either HRG or placebo gas (air) for 60 minutes before cycling at 80% W_{max} until exhaustion.

Key findings from the study include:

- **Reduced perceived fatigue:** Participants who inhaled HRG reported significantly lower scores on the Visual Analog Scale (VAS) for fatigue compared to those who inhaled placebo gas.
- **Improved [exercise](#) performance:** HRG [inhalation](#) improved cycling frequency during the final 30 seconds of the exercise and reduced the rating of perceived exertion (RPE) at both the beginning and end of the ride.
- **Oxidative stress markers:** HRG inhalation showed a significant improvement in the ability to inhibit [hydroxyl radicals](#) and lower serum lactate levels after exercise, indicating reduced oxidative stress.
- **Functional performance:** While HRG did not significantly impact counter-movement jump (CMJ) height or glutathione peroxidase activity, the overall benefits on fatigue and oxidative stress markers were notable.

"The study's findings suggest that HRG inhalation prior to exercise could be a valuable strategy for athletes and fitness enthusiasts looking to enhance performance and recovery. By mitigating fatigue and improving markers of oxidative stress, HRG has the potential to support more

effective training and better overall health outcomes," said Junhong Zhou, Ph.D., assistant scientist II, Hinda and Arthur Marcus Institute for Aging Research, Hebrew SeniorLife.

The study opens new avenues for exploring the benefits of hydrogen-rich gas in sports and exercise science. As further research continues, HRG inhalation may become a widely adopted practice for enhancing athletic performance and combating exercise-induced [fatigue](#).

More information: Gengxin Dong et al, Inhalation of hydrogen-rich gas before acute exercise alleviates exercise fatigue, *International Journal of Sports Medicine* (2024). [DOI: 10.1055/a-2318-1880](https://doi.org/10.1055/a-2318-1880)

Provided by Hebrew SeniorLife Hinda and Arthur Marcus Institute for Aging Research

Citation: Hydrogen-rich gas inhalation can alleviate exercise-induced fatigue (2024, July 30) retrieved 31 July 2024 from <https://medicalxpress.com/news/2024-07-hydrogen-rich-gas-inhalation-alleviate.html>

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