

Post-Exercise Hyperbaric Oxygenation Improves Recovery for Subsequent Performance

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- PMID: 35389333
- DOI: [10.1080/02701367.2021.2002797](https://doi.org/10.1080/02701367.2021.2002797)

Abstract

Background: The improvement of athletes' recovery seems crucial to maintaining a high-performance level. Since hyperbaric oxygenation (HBO) could be a valuable recovery method, this study aimed at determining the effects of post-exercise HBO at modest pressure (97% O₂; 1.3 ATA) on physiological response and subsequent cycling performance compared to passive recovery (PR; 21% O₂; 1 ATA).

Methods: Twelve trained cyclists completed two testing sessions in a random crossover design. Both sessions consisted of one fatiguing exercise immediately followed by either HBO or PR recovery intervention (75 minutes), then a 5-minute maximal cycling effort. Cycling power output, heart rate variability (HRV) during recovery, blood lactate, and the rating of perceived exertion (RPE) were analyzed and compared between conditions.

Results: Compared with PR, the cycling power output was significantly higher after HBO (307.5 ± 19.0 W vs 314.5 ± 19.3 W; $p = .005$; ES = 0.11 [-0.70-0.90]). Moreover, several HRV indices revealed an improvement in HRV recovery in HBO condition. Blood lactate was not significantly different between conditions, neither following the fatiguing exercise nor the maximal effort. HBO decreased RPE after maximal cycling effort and improved the perceived recovery the day after testing sessions ($p < .001$).

Conclusion: This study suggests that HBO is an efficient strategy to improve cardiac parasympathetic reactivation and is beneficial for subsequent performance.