Journal of Science & Cycling
Breakthroughs in Cycling & Triathlon Sciences

OPEN ACCESS

Conference Abstract

Performing High-Intensity Training Following Prolonged Exercise Impacts Durability-Related Adaptations

Gabriele Gallo [1,2,*], Bent Rønnestad [3], Øyvind Sandbakk [4], Knut Skovereng [4], Ed Maunder [2], Daniel Gotti [5], Leif Tallaksen [3], Emanuela Faelli [1,6*], Piero Ruggeri [1,6]. Andrea Meloni [5,7], Roberto Codella [5,7], Luca Filipas[5,7]

1 Department of Neuroscience, Rehabilitation, Ophthalmology, Genetics, Maternal and Child Health, University of Genoa, Genoa, Italy.
2 Sports Performance Research Institute New Zealand, Auckland University of Technology, Auckland, New Zealand
3 Section for Health and Exercise Physiology, Inland Norway University of Applied Sciences, Lillehammer, Norway
4 Centre for Elite Sports Research, Department of Neuromedicine and Movement Science, Norwegian University of Science and Technology, Trondheim, Norway.
5 Department of Biomedical Sciences for Health, Università degli Studi di Milano, Milan, Italy.
6 Department of Experimental Medicine, University of Genoa, Genoa, Italy.
7 Department of Endocrinology, Nutrition and Metabolic Diseases, IRCCS MultiMedica, Milan, Italy.

* Correspondence: (GG) gabriele.gallo.gg95@gmail.com

Received: 15 January 2024 **Accepted:** 26 March 2024 **Published:** 1 August 2024

Abstract: Durability refers to resilience to the effects of prolonged exercise on physiological profiling characteristics. The aim of this study was to investigate if performing high-intensity training (HIT) at the end of long low-intensity training sessions enhances durability. Twenty trained cyclists were randomly allocated to one of two four-week training interventions (CON, n=10 and INT, n=10). INT performed HIT at the end of long low-intensity sessions, while CON performed HIT and long low-intensity sessions on separate days. Weekly training was matched for overall volume and time in zones. An incremental test to determine the first (VT_1) and second (VT_2) ventilatory thresholds, and a 5-min time trial (TT), was performed in a rested state (-rest) and after 2.5-h cycling (-2.5h) pre- and post-intervention. Adaptations to VT_1-rest favored CON ($\eta_p^2 = 0.14$), although this was not significant ($p = 0.101$). There was a greater improvement in VT_2-rest in CON vs. INT ($p = 0.015$; $\eta_p^2 = 0.29$). Adaptations to VT_1-2.5h favored INT ($\eta_p^2 = 0.19$), although this was not significant ($p = 0.057$), while no group differences in adaptations to VT_2-2.5h were observed. Following prolonged exercise, VT_1 was better maintained after INT vs. CON ($p = 0.015$; $\eta_p^2 = 0.29$). Group differences in this effect for VT_2 were not significant, but there was a large effect size in favor of INT ($p = 0.058$; $\eta_p^2 = 0.19$). Adaptations to TT-rest and TT-2.5h were not different between-groups. These data indicate the timing of HIT impacts adaptations related to durability in trained cyclists.

Keywords: Durability.