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MECHANICAL, CARDIORESPIRATORY, AND MUSCULAR OXYGENATION RESPONSES TO SPRINT INTERVAL EXERCISES UNDER DIFFERENT HYPOXIC CONDITIONS

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Introduction

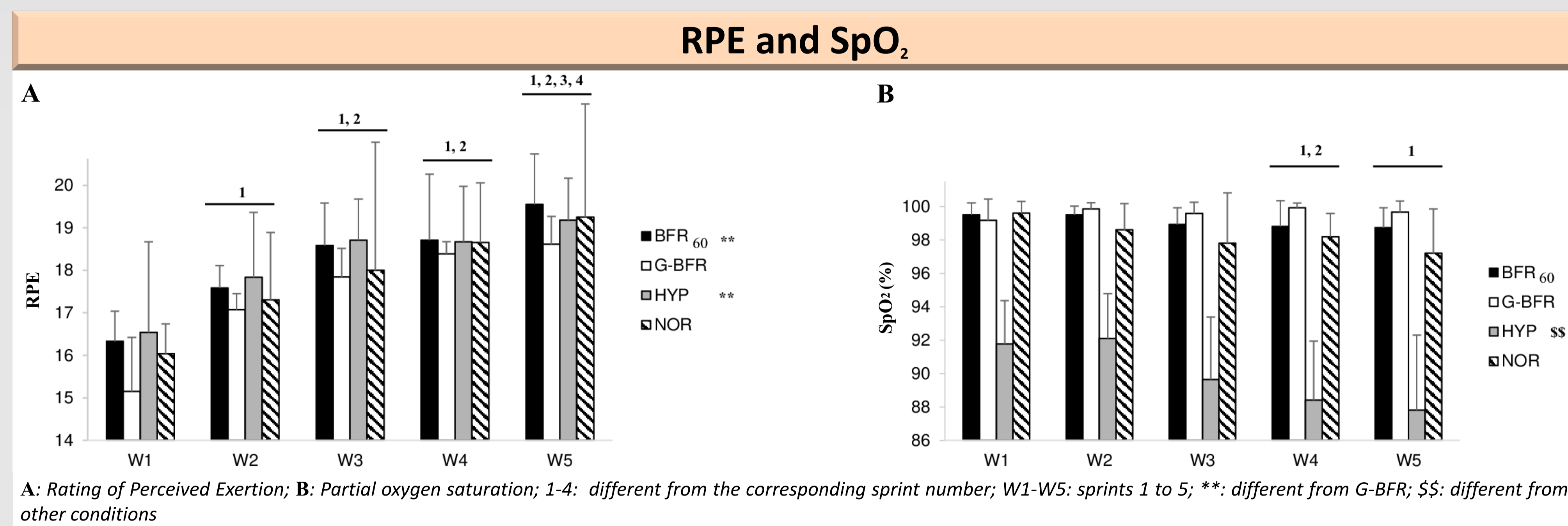
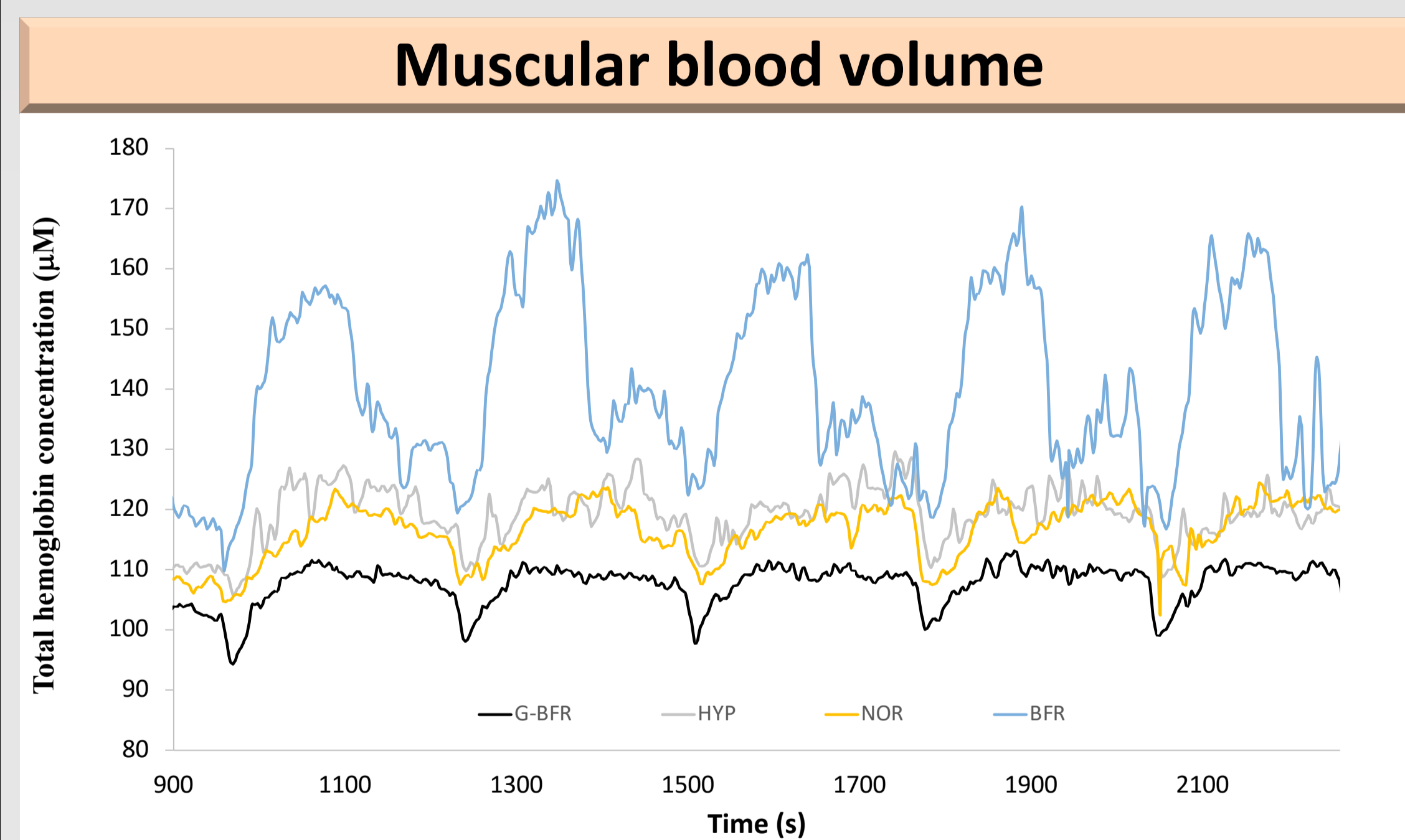
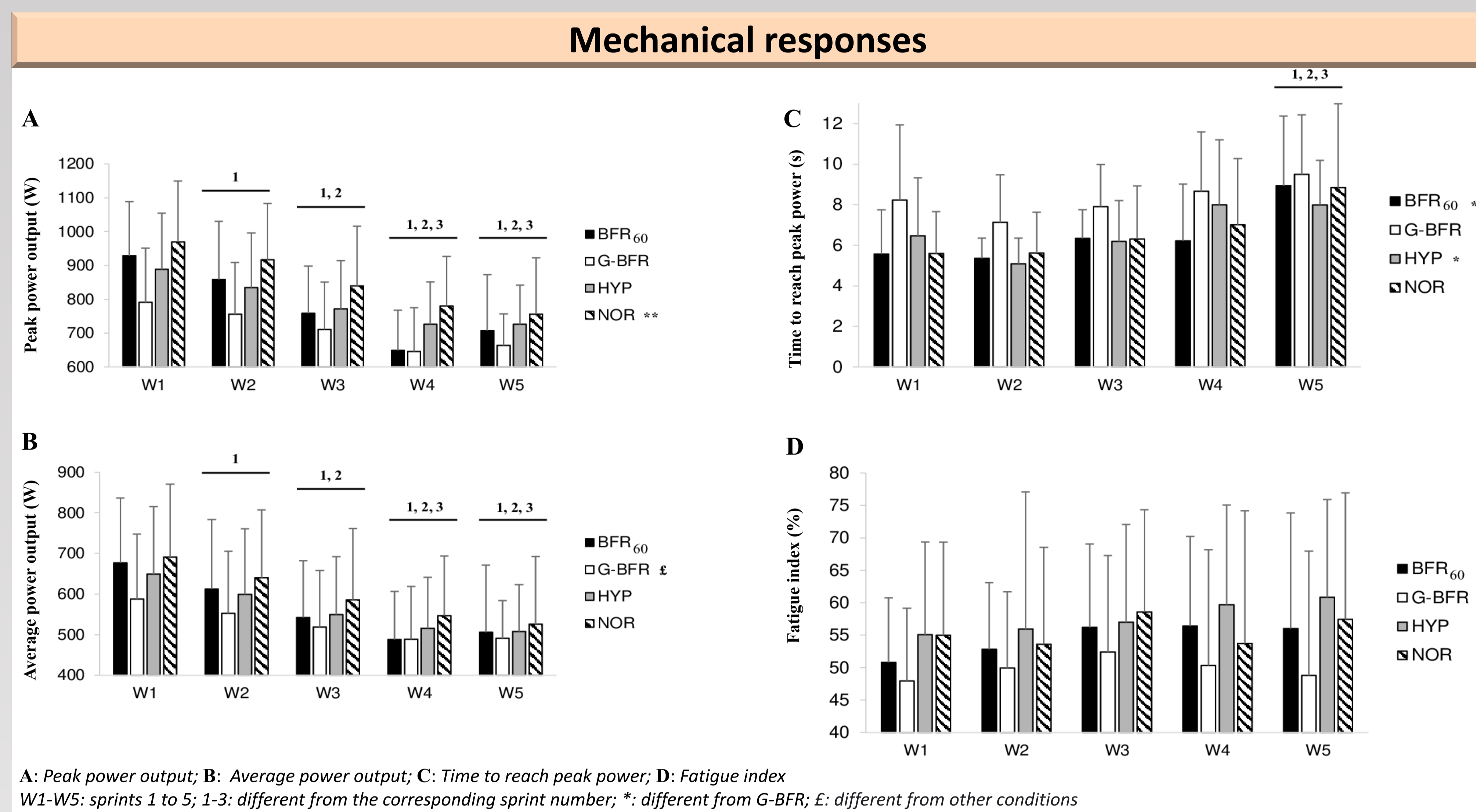
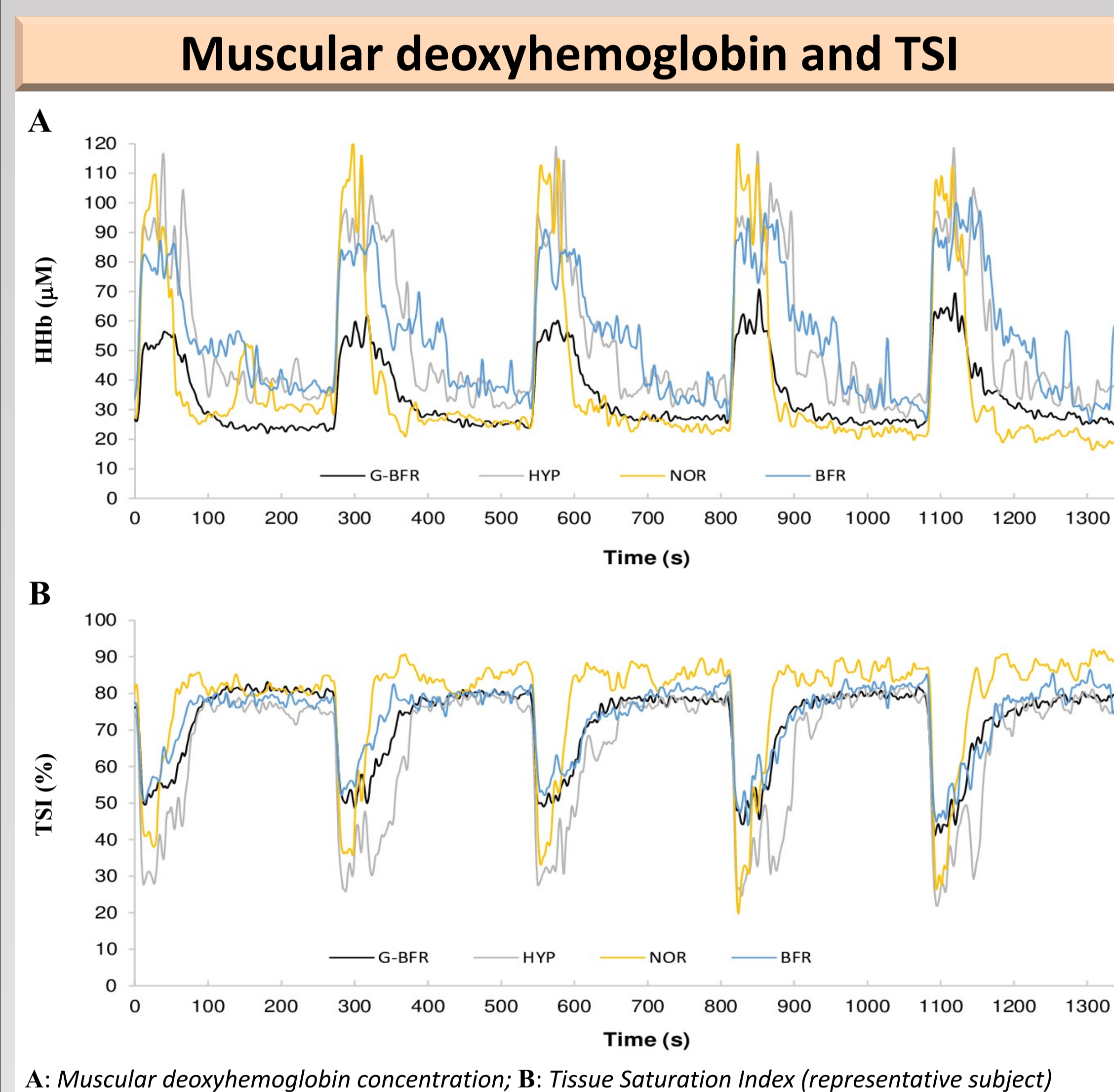
Sprint interval training (SIT) is a training method in vogue that shortly improves aerobic performance and repeated sprint ability [1,2]. An additional hypoxic stress added to repeated sprint sessions amplifies some training adaptations [3]. However, little is known about the use of hypoxia during SIT protocols and their acute effects on mechanical, cardiorespiratory, and muscle oxygenation outcomes. The aim of the study was to compare the responses to SIT exercises under different hypoxic conditions.

Methods

13 young men performed 4 SIT sessions (5x30 s all-out with 4 min of passive recovery) under different conditions in a random order:

NORMOXIA (NOR) < 400 m above sea level (SL)	HYPOXIA (HYP) FiO ₂ =13% (4000 m above SL)	Blood Flow Restriction (BFR _{60%}) Compression cuffs 2 min post-sprints	Gravity-induced BFR (G-BFR) Supine position
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Results



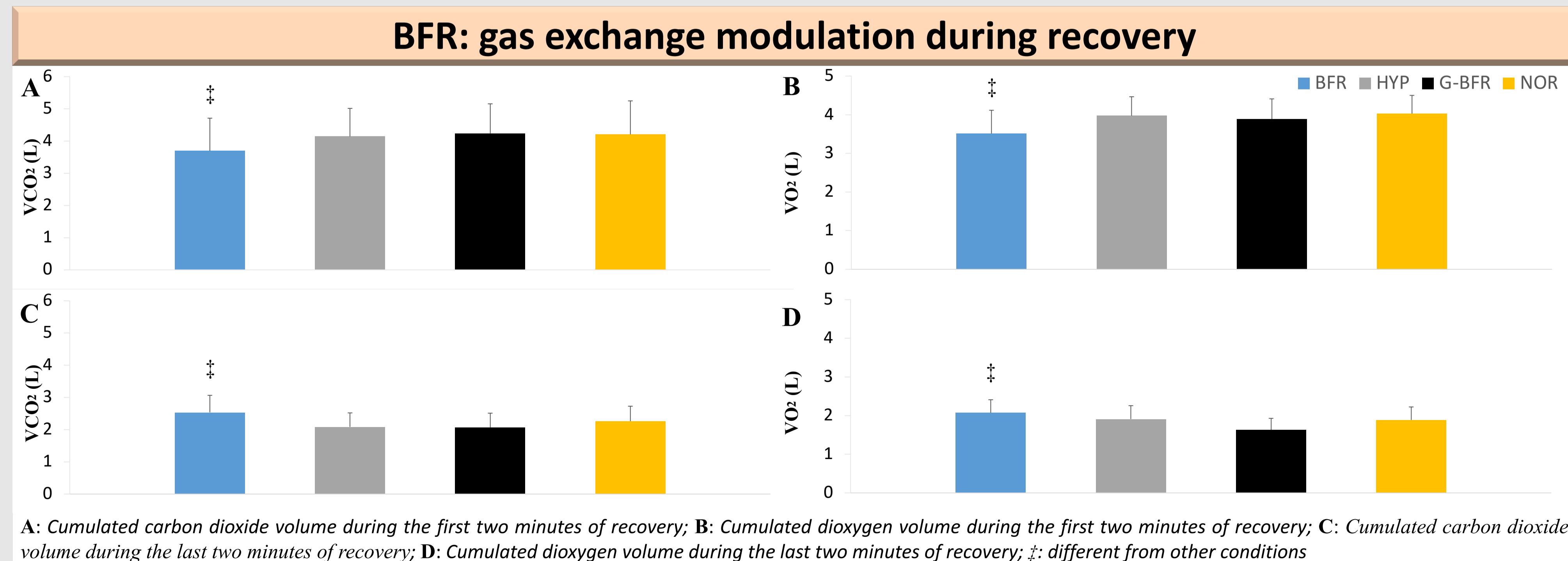
Cardiorespiratory parameters

Lower in G-BFR:

- $\dot{V}E$, $\dot{V}E_{\text{peak}}$, $\dot{V}E_{\text{min}}$, $\Delta\dot{V}E$
- $\dot{V}O_2$

HYP:

- $\dot{V}E_{\text{peak}}$ increased
- $\dot{V}O_2$ & $\dot{V}O_{2,\text{peak}}$ decreased



Conclusions

G-BFR: minor mechanical and cardiorespiratory stress but ischemic effect [4]

BFR: blood accumulation in muscles \rightarrow metabolic stress

HYP: preserved performance with systemic hypoxia

