69.

Changes in hemoglobin and iron status parameters after repeared exercise

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Background

Iron is an essential micronutrient that is required for the synthesis of blood hemoglobin (Hb). Concentrations of iron storage- and transport proteins are affected by pathological conditions such as inflammation or intense exercise. It is however not known how a less intense and repeated type of exercise may affect iron status parameters. In the current study we evaluated the dynamics of several iron status parameters during a 4-day walking event.

Methods

- 98 volunteers from the Nijmegen Four Days Marches 2015;
- Males & females, age 21-86 years, written informed consent;
- Blood collection at baseline (d0) and every day directly after finishing (d1-d4);
- Iron status assessment: Hb, iron, transferrin, transferrin saturation, and ferritin, using standard laboratory procedures in a clinical chemistry laboratory (ZGV, Ede);
- Statistical analyses using SPSS v23.0 software; linear mixed models analysis for the analysis of time effects.

Results

- Mean Hb levels increased from 9.4 mmol/L (d0) to 9.5 mmol/L (d1) and subsequently decreased to 9.0 mmol/L (d4) (Figure 1a/b);
- Mean iron levels decreased from 17.4 µmol/L (d0) to 11.1 µmol/L (d4) (Figure 2a/b);
- Mean transferrin & transferrin saturation showed similar decreasing patterns (Figure 3a/b);
- Mean ferritin levels increased from 102.4 µg/L (d0) to 115.6 µg/L (d2) and continued to be elevated at d3 and d4 (Figure 4a/b);
- The measured iron status parameter concentrations showed a large degree of inter-person variation over all days (Figures 1a, 2a, 4a).

Conclusions

Iron status parameters are significantly changed following repeated exercise. Except for transferrin, the results are comparable to what is observed after intense physical exercise.

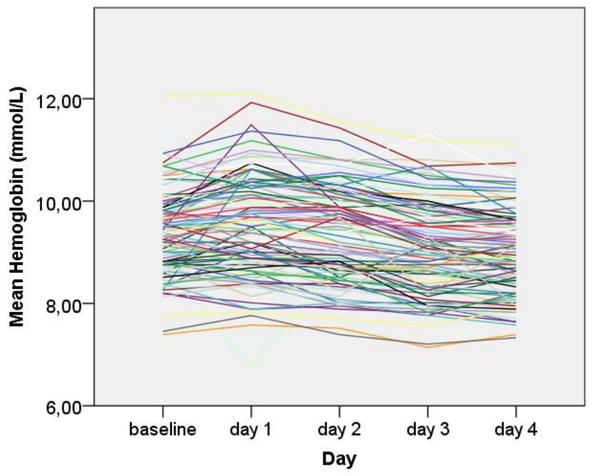

Figure 1a: individual time curves for Hb.

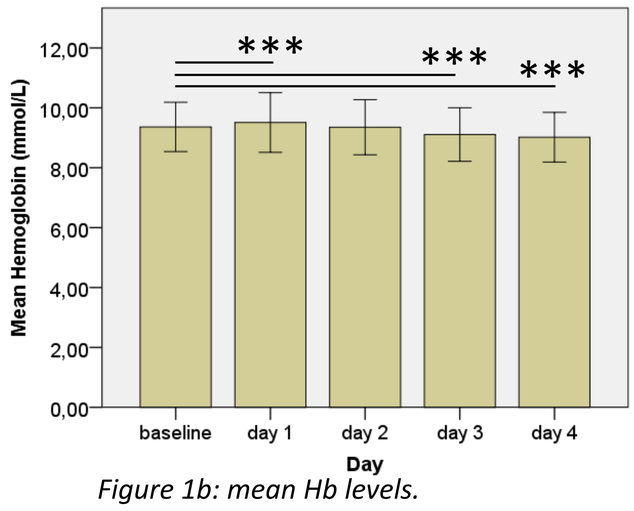

Figure 1b: mean Hb levels.

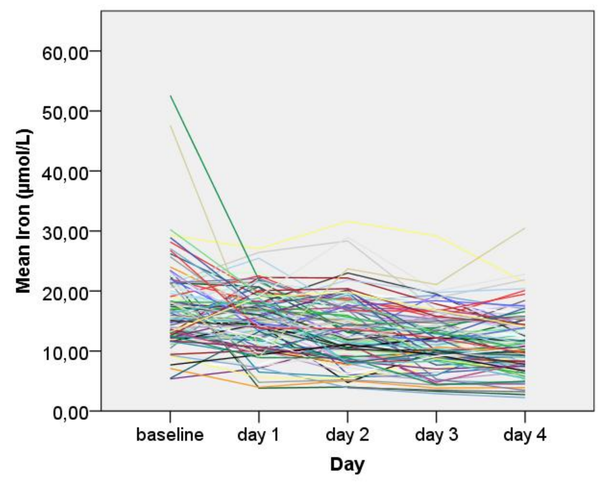

Figure 2a: individual time curves for iron.

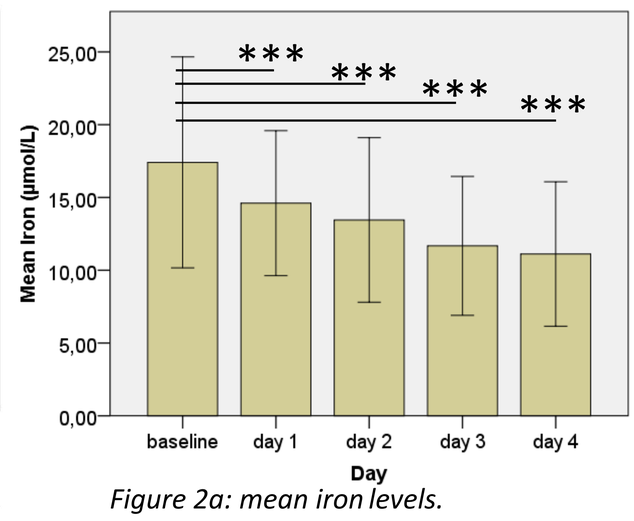

Figure 2a: mean iron levels.

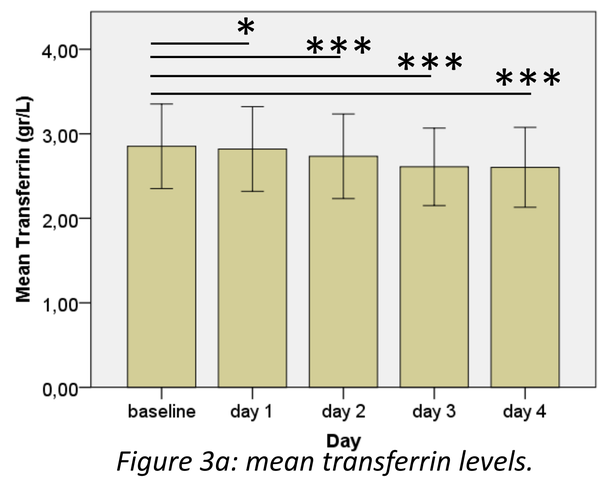

Figure 3a: mean transferrin levels.

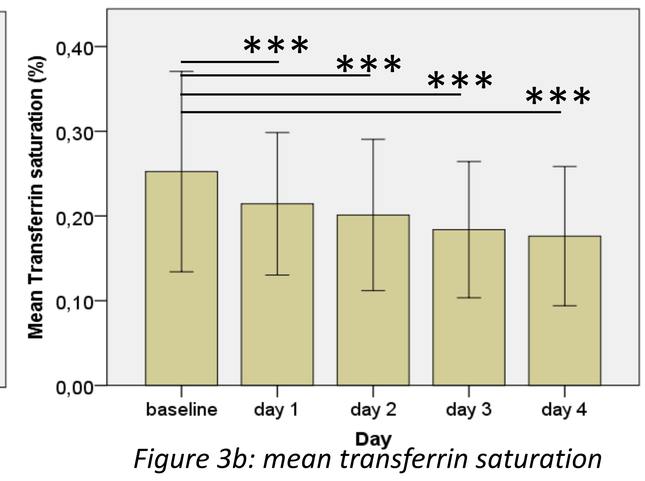

Figure 3b: mean transferrin saturation levels.

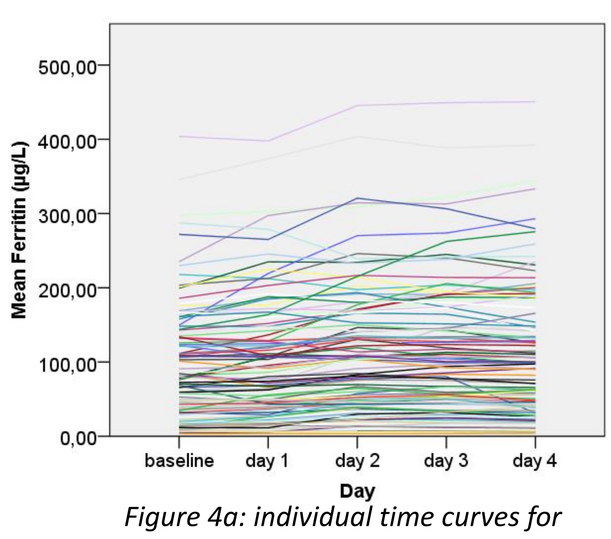

Figure 4a: individual time curves for ferritin.

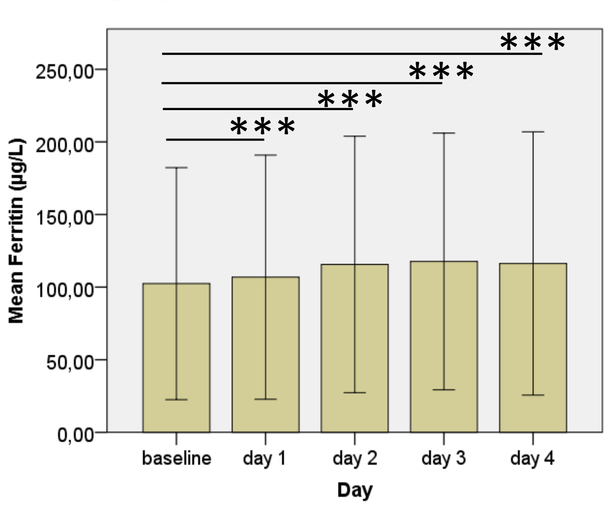

Figure 4b: mean ferritin levels.

*All figures: * P < 0.05 ** P < 0.01 *** P < 0.001*
Error bars represent standard deviation