



Changes of various hematological parameters in response to vigorous continuous endurance exercise training in healthy young men: a single group analysis

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Background

It has previously been observed that endurance exercise training affect hematological parameters including erythrocyte volume, hematocrit value, hemoglobin concentration, mean corpuscular volume (MCV), mean corpuscular hemoglobin (MCH) and mean corpuscular hemoglobin concentration (MCHC). Moreover, changes in hematological parameters contribute to changes in VO_{2max} with endurance exercise training, predominantly by influencing circulatory oxygen transport capacity to the working muscles. To date, there is little data on the effects of temporary changes in hematological parameters in response to vigorous continuous cycling training.

Aim

To assess the response of various hematological parameters with prolonged vigorous continuous exercise training.

Methods

N = 22 Age = 22.2 ± 3 BMI = 22.6 ± 1 VO_{2max} = 50.1 ± 4
Frequency 3 sessions pw **Intensity** 85% HRR **Mode** continuous **Volume** 60 minutes



Figure 1. Schematic representation of study procedure.

VO_{2max}

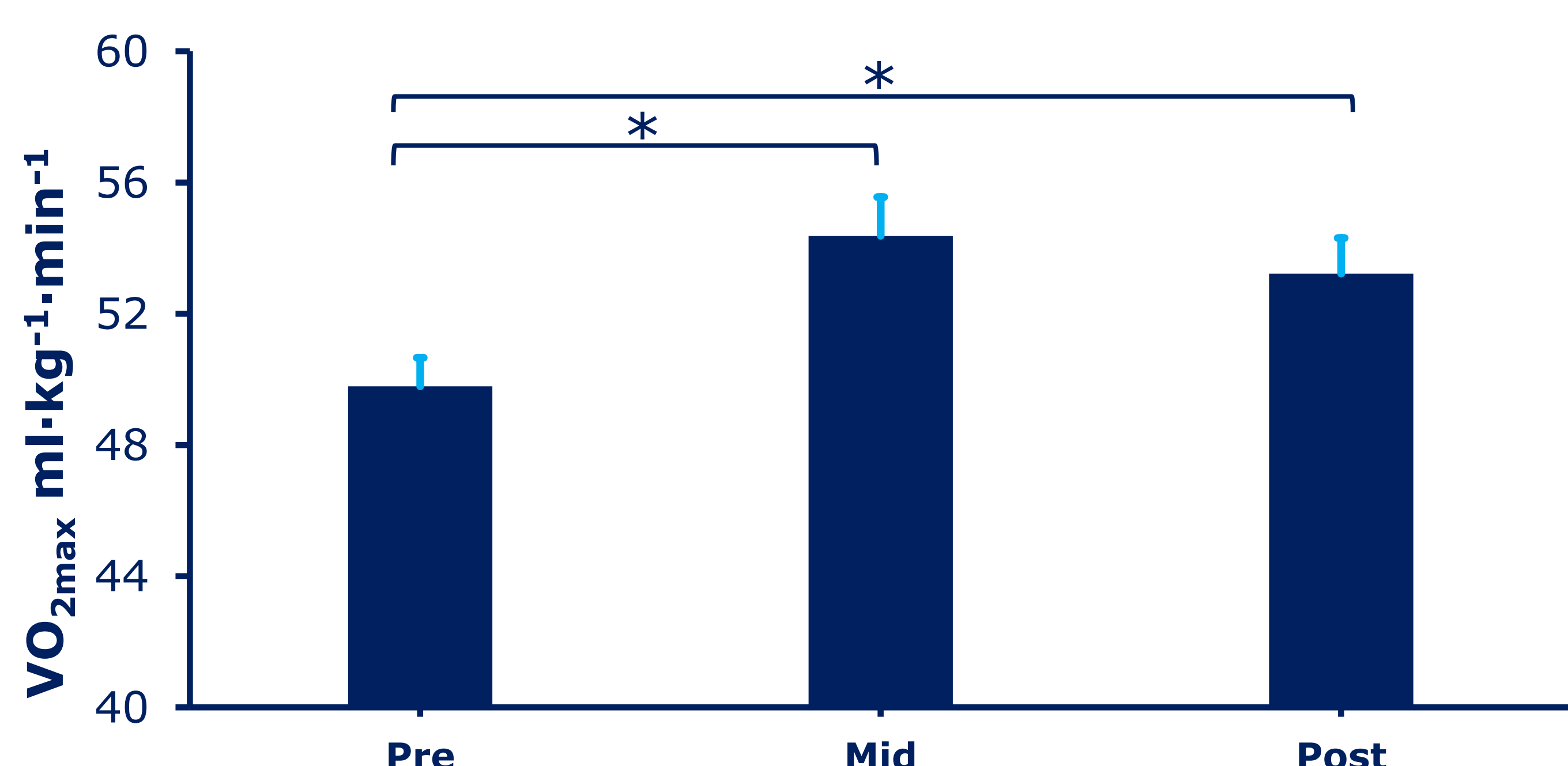


Figure 2. Changes in VO_{2max} in ml/kg/min determined with an progressive maximal aerobic exercise test. Mean ± SE. *Significantly different compared to baseline (P < 0.05).

Hematological parameters

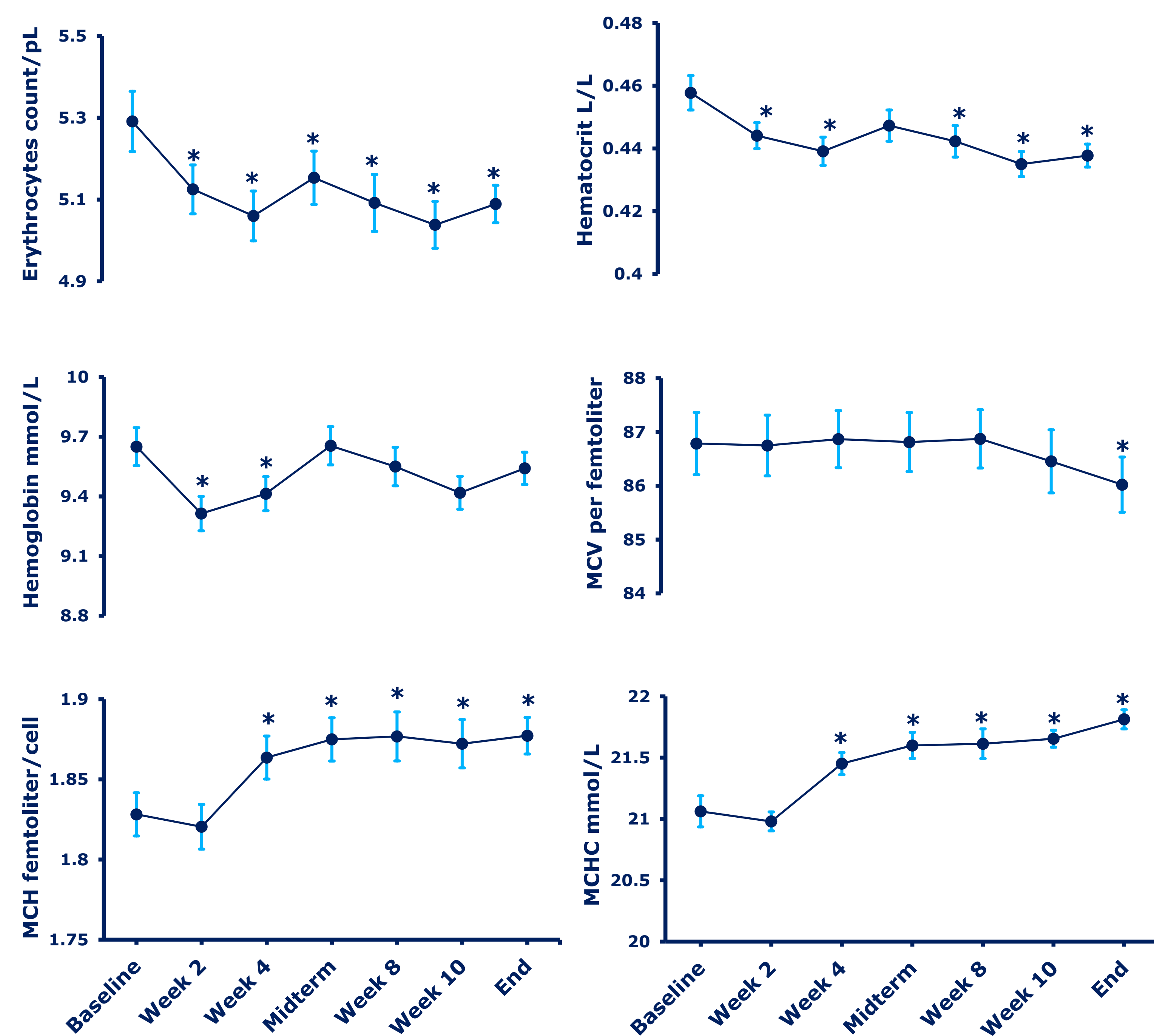


Figure 3. Erythrocytes, hematocrit, hemoglobin, MCV, MCH and MCHC responses during a 12-week continuous vigorous endurance training. Mean ± SE. *Significantly different compared to baseline (P < 0.05).

Interpretation

- The reduction in erythrocyte count, hematocrit and hemoglobin concentration are most likely explained by hemodilution secondary to plasma volume expansion.
- Intravascular hemolysis may contribute to the decrease in these hematological parameters.
- The increase in MCH and MCHC may reflect an improved oxygen carrying capacity of the red blood cells and might be a compensatory adaptation for the observed decreases in erythrocyte count, hematocrit and hemoglobin concentration secondary to hemodilution and hemolysis.