Race Cycling: biological variations

Caroline Le Goff
PhD Student
Clinical Biologist
University Hospital of Liège
Belgium
The metabolic and cardiac impact of a cycling effort on blood biology is not very well described in the literature.

We aimed to measure the concentration of different biomarkers (cardiac and metabolic) released during an international cycling race.
Materials and methods

• The race = international cycling race = « la flèche Ardenaise »
• Subjects:
  ➢ 15 young men (25.1 ± 6.4 y.o)
  ➢ Amateur and elite/hope categories
• Protocol: 3 blood samples:
  ➢ One just before = T0
  ➢ Just after = T1
  ➢ 3 hours after the race = T3
• Mean Performance = 4h02±16min
Materials and methods

Determination of cardiac and metabolic biomarkers:
- Red blood cells (RBC)
- Haemoglobin (HgB)
- Creatinin (Cr)
- Highly sensitive troponin T (hsTnT)
- Myoglobin (MYO)
- NT-proBNP
Results
Red blood cells

Inferior Decision Limit: 4.40 \times 10^6/mm^3

Superior Decision Limit: 5.7 \times 10^6/mm^3

\( p = 0.0026 \)
Haemoglobin

Decision limit: 16.9 g/dL

R1; Muy. Moindres Carrés
Effet courant : F(2, 26)=7,6477, p=0,00244
Décomposition efficace de l'hypothèse

Les barres verticales représentent les intervalles de confiance à 0,95

p=0.002
Creatinin

R1; Moy. Moindres Carrés
Effet courant : F(2, 26)=29.233, p=.00000
Décomposition efficace de l'hypothèse
Les barres verticales représentent les intervalles de confiance à 0.95

Decision limit: 11.8 mg/L

p<0.0001 T0-T1, p=0.0326 T1-T3, p=0.0001 T0-T3
Myoglobin

\[ T_0 - T_1 \ (p<0.0001), \ T_0 - T_3 \ (p=0.014) \]

Decision limit = 72 µg/ml
TnThs

T0-T1: p<0.0001 and T0-T3: p<0.0001

Decision limit: 0.014 µg/L
NT-proBNP

Decision limit: 103 ng/L

T0-T1: p<0.0001 and T0-T3: p<0.0001
Conclusions

• Our results show that stress generated by a cycling race could be the cause for the different metabolic variations observed.

• Troponin T stays the most specific marker for stress related to myocardial tissue.

• Its increase can then be considered as being of interest.
Thank you very much for your attention!