

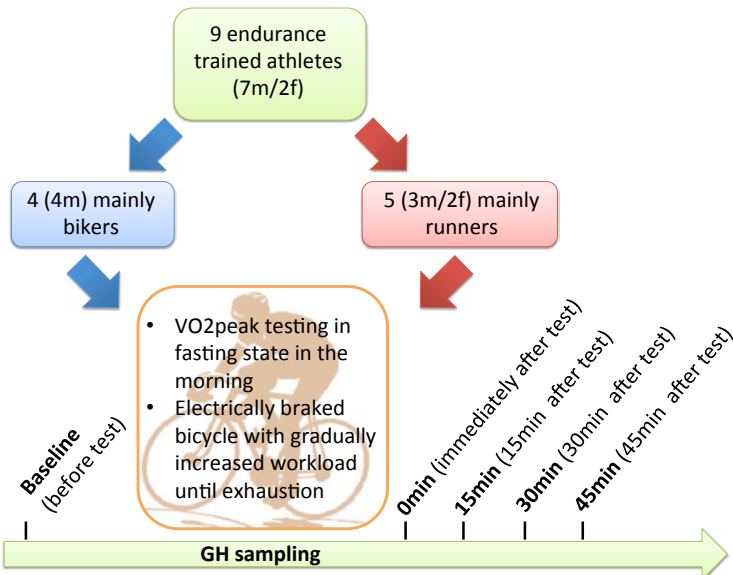
Thomas Zueger, Julie Bucher, Emanuel Christ, Christoph Stettler

Division of Endocrinology, Diabetes & Clinical Nutrition, Inselspital, University Hospital and University of Bern, Switzerland

Background & Aims

- As previously shown a standardized aerobic exercise of moderate intensity and a duration of around 60 minutes is a reliable test with high diagnostic accuracy in predicting severe growth hormone (GH) deficiency (GHD) in adult individuals.
- To improve clinical applicability of exercise testing in the diagnosis of GHD a shorter test protocol would be preferable.
- The present study investigated the exercise-induced GH response in healthy athletes during an incremental VO₂ peak testing on a bicycle.
- We hypothesized that GH response would be smaller in bikers investigated on the bicycle compared with their running counterparts.

Materials & Methods



Results

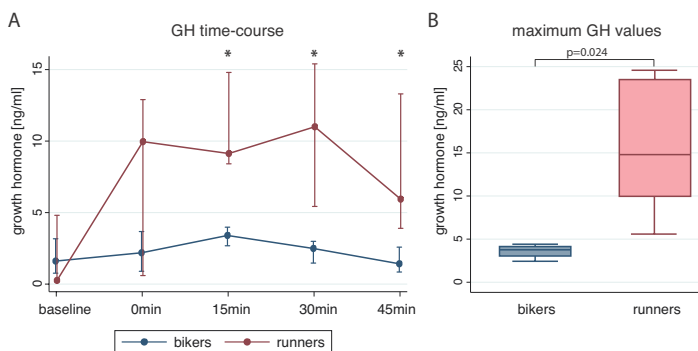


Figure 1
A: GH time-course for bikers (blue dots/lines) and runners (red dots/lines) before (baseline), immediately after (0min) and 15, 30 and 45min after the exercise test (15min, 30min, 45min, respectively; displayed as median and interquartile range); * $p < 0.05$.
B: Comparison of peak GH-values in response to the exercise for bikers and runners.

- Mean±SD age was 33±9.7 years, mean exercise duration was 11.0±1.5 min and mean VO₂ peak was 54.6±5.8 ml/kg.
- Age, BMI, VO₂max and gender did not significantly differ in the two exercise groups ($p > 0.05$).
- For athletes mainly exercising on bike mean GH values were 1.97±1.9, 2.29±1.8, 3.33±0.8, 2.23±1.0 and 1.72±1.4 ng/ml before, directly after exercise and at 15, 30, and 45 min after the test, respectively.
- The corresponding GH values in athletes whose exercise mainly consisted of running were 2.51±3.3, 8.48±7.9, 12.50±7.5, 10.90±6.6, and 9.82±8.7 ng/ml, respectively.
- Peak GH was significantly lower in bikers compared with runners (3.59±0.8 vs 15.69±8.3, $p = 0.0244$).

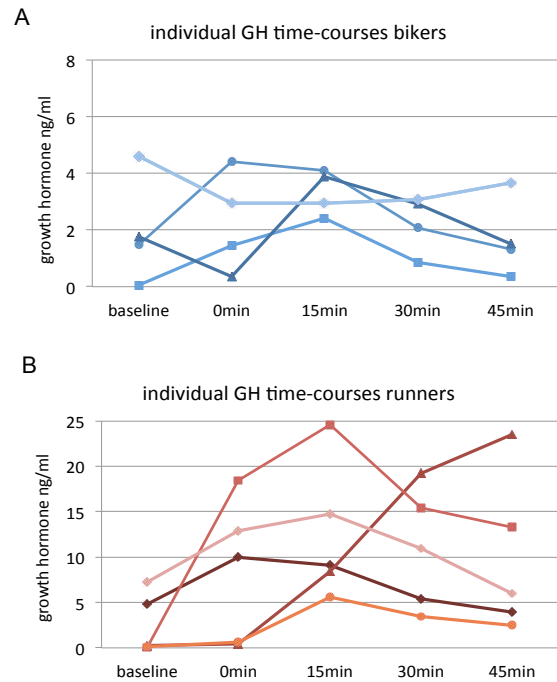


Figure 2: Comparison of individual GH-response in runners (fig. 2A) and bikers (fig. 2B) before (baseline), immediately after (0min) and 15, 30 and 45min after the exercise test (15min, 30min, 45min, respectively).

Conclusion

- In athletes a short exercise test appears a promising test to provoke pituitary GH secretion.
- When investigating individuals performing regular exercise the type of activity may be of importance in the choice of the test conditions:
 - While bicycle testing induced a strong GH response in runners it resulted in considerably lower GH stimulation in bikers.
 - This difference may be due to habituation effects resulting in a weaker stimulus.
 - Whether testing bikers on a treadmill will revert this effect will have to be studied in a next step.