Growth hormone responses to repeated bouts of aerobic exercise with different recovery intervals

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To the Editor: we read with interest the paper by Stokes et al., concerning growth hormone (GH) responses to two repeated 30-s bouts of sprint exercise with different recovery periods (60 min and 240 min) between bouts.

We have recently studied GH responses to two consecutive 30-min cycling sessions at 80% of individual maximal oxygen consumption (VO_2 max) in amateur competitive cyclists (mean age±SE: 28.7±2.3 yr; mean weight: 65.2±2.4 kg). Subjects were tested on three occasions with different time intervals between the two bouts: 120 min (*experimental* A), 240 min (*experimental* B) and 360 min (*experimental* C). As reported in Figures 1 and 2, peak GH concentration and GH incremental area under the curve (GH AUC, ng/ml/90 min) in response to the second bout was significantly lower (p<0.01) than that observed after the first bout in *experiments* A and *experiments* B, while no difference was detected between the two bouts in *experimental* C.

It is noteworthy the similarity in the pattern of GH responsiveness to short-term repeated bouts of exercise between the two studies, in spite of a markedly different duration (30 s vs. 30 min) and intensity of exercise (sprint vs. sub-maximal exercise). The ensemble of these results are also in line with those reported by Cappon et al., who demonstrated a marked reduction of GH responses in healthy non-athletes performing three repeated bouts of 10-min exercise (60 min interval in between) in the mid-range between lactate threshold and VO_2 max.

In our hands, the attenuation of the GH response was eliminated when greater recovery time (i.e., 360 min) was provided between exercise bouts, thus indicating that pituitary refractoriness was fully reversible. The trend of decreasing GH responsiveness to repeated bouts of exercise resembles the pattern of responsiveness found with repeated administration of 1 µg/kg body wt GH-releasing hormone at the same intervals in normal adults, thus suggesting that both pharmacological and exercise repeated stimuli may exert a comparable negative feedback on GH secretion and/or elicit a transient depletion of the promptly releasable pituitary GH pool.

The blunting of GH responsiveness to short-term repeated exercise bouts does not seem related to the intensity and duration of the exercise, being present in different experimental conditions, and to the amount of GH released after the first exercise bout (range of GH peaks: 6-23 ng/ml).

The knowledge of this pattern of exercise-induced GH secretion could be useful to athletes when planning their training sessions for producing physiological greater amounts of GH-IGF-I. Although all these data may have some implications for exercise prescription in athletes (in terms of the optimal combination of intensity and recovery in between training sessions), further additional studies are necessary to extend these observations to different sport activities, both aerobic and anaerobic.