Evaluating Stress Hormones’ Responses to Exercise in Lean Versus Obese Children Using Different Methodologies

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ABSTRACT

The purpose of this study was to determine whether three different methods to assess changes in hormonal concentrations over time (i.e., baseline (PRE) to different times following exercise) lead to varying conclusions about the hormone’s response to exercise and during recovery. This latter method evaluates the hormone’s overall, integrated response or relative changes from PRE as exposure of hormones to tissues, integrated responses or relative changes from PRE as shown that the results from other analytical methods (i.e., AUC or relative percent change) varied when using calculated percent change (M3) as opposed to absolute concentrations (i.e., M1 or M2). However, when using calculated percent change (i.e., M3), there was a greater relative change from PRE for NE when only one group displayed a significant change from baseline (IP > all times in LN only). Therefore, the findings suggest that evaluating the stress hormone response to exercise using one method can result in a misinterpretation of the hormone’s response.

INTRODUCTION

The purpose of this study was to determine whether there are differences in how metabolic hormones respond to the exercise bout. The underlying issue is that there is no gold standard for evaluating the hormonal response at each time during recovery was similar between lean and obese.

METHODS

Participants

11 lean children (i.e., body fat percentage between the 2nd and 85th percentile for sex and age) [1].

Baseline Testing

• Resting metabolic hormones were assessed at baseline (see Figure 3-M1) and calculated percent change from PRE.

Exercise Protocol

• 7 g fat, 50 g carbohydrates, and 20 g protein at 30 min prior to exercise.

Exercise

• Intensity: 120-140% of HR reserve determined to elicit HR ~160 bpm.

RESULTS

Statistical Analysis

Significance was set at p < 0.05 for all analyses. Participant characteristics were analyzed using independent samples t-tests. Hormonal data were log-transformed and analyzed using ANOVA (M1 & M3) and 2 (group) x 4 (time) ANOVA for percent changes from PRE.

DISCUSSION

The findings suggest that evaluating the stress hormone response to exercise using one method can result in a misinterpretation of the hormone’s response. It is essential to use the correct method to properly understand the hormone’s response at each time during recovery. When using calculated percent change (M3), there was a greater relative change from PRE for NE when only one group displayed a significant change from baseline (IP > all times in LN only). Therefore, the findings suggest that evaluating the stress hormone response to exercise using one method can result in a misinterpretation of the hormone’s response.

CONCLUSION

Evaluating the stress hormones’ response to exercise by analyzing absolute concentrations describes the hormone’s exposure to tissues before, in response to and during recovery from the stimulus. This study showed that the results from other analytical methods (i.e., AUC or relative percent change) varied when using calculated percent change (M3) as opposed to absolute concentrations (i.e., M1 or M2). However, when using calculated percent change (i.e., M3), there was a greater relative change from PRE for NE when only one group displayed a significant change from baseline (IP > all times in LN only). Therefore, the findings suggest that evaluating the stress hormone response to exercise using one method can result in a misinterpretation of the hormone’s response.

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