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*Abstract*

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**Effects of a High Intensity Interval Training (HIIT) in lactate and heart rate during the menstrual cycle in young skater athletes**

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ABSTRACT

**INTRODUCTION:** High intensity interval training (HIIT) effects on heart rate and lactate concentration have been widely documented in male and female athletes. However, there few reports focused to study the dynamics of these cardiac and metabolic markers during the different phases of the menstrual cycle.

**PURPOSE:** The aim of this study was analyze the dynamics of heart rate and lactate concentration during a HIIT protocol in the different phases of the menstrual cycle (MC) in young eumenorrheic athletes women.

**METHODS:** Two young skater athletes (14.5±0.7 yrs.) with regular menstrual cycles were recruited. The normality of the cycle was measured with a menstrual calendar. The estimated VO<sub>2</sub> max was assessed in an electrically braked cycle ergometer (Lode) using a graded exercise test. The HIIT protocol consisted of 12 sessions of 6 high intensity intervals at 80% VO<sub>2</sub> max, and 6 rest intervals at 40% VO<sub>2</sub> max. Basal and post-exercise heart rate (HR) and lactate concentrations (LC) were measured with a pulsometer (polar FT1) or test strips (Nova Biomedical), respectively. The MC was divided in six phases: Early follicular (EF), Mid follicular (MF), Late follicular (LF), Early luteal (EL), Mid luteal (ML) and Late luteal (LL), using the date since their first menstrual discharge as the start of the EF phase.

**RESULTS:** There was a significant correlation between HR and LC (r: 0.37, p: 0.0034) throughout the 12 HIIT sessions, but this was not statistically significant in EF (r: 0.36, p: 0.21), MF (r: 0.86, p: 0.12), LF (r: 0.14, p: 0.68), ML (r: 0.04, p: 0.92) and LL (r: 0.67, p: 0.06). Interestingly, we did observe a highly significant correlation between HR and LC (r = 0.68, p = 0.0033) in the EL phase, characterized by rising progesterone levels and a transient decrease of estradiol concentrations.

**CONCLUSION:** These preliminary results suggest that the normal fluctuation of steroid hormone levels during the menstrual cycle can affect the dynamics of HR and LC in eumenorrheic athletes.