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PGC-1α ISOFORMS ARE UPREGULATED AFTERTRADITIONAL ENDURANCE EXERCISE AND NOT AFTER LOW-INTENSITY ENDURANCE EXERCISE WITH BLOOD FLOW RESTRICTION

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INTRODUCTION: It is well established that High-intensity endurance exercise (HIEE) increases peak oxygen uptake (VO2peak) while high-intensity resistance exercise (HI-RE) improves muscle hypertrophy. However, blood flow restriction (BFR) during low-intensity endurance exercise (LIE-BFR) has been shown to concurrently improve VO2peak, muscle strength and hypertrophy, but the molecular response to understand that concurrent muscle adaptation after LIE-BFR is not clear yet. It has been demonstrated that peroxisome proliferator-activated receptor-γ coactivator 1α (PGC-1α) regulates mitochondrial biogenesis and leads to rise of endurance capacity, especially after HIEE. On the other hand, it has been described a new transcript from the PGC-1α gene, called PGC-1α4, that is expressed after HI-RE and leads to muscle hypertrophy. **PURPOSE:** To **c**ompare the mRNA expression of PGC-1α1, PGC-1α2, PGC-1α3 and PGC-1α4 after LIE-BFR, HI-EE and HI-RE. **METHODS:** 9 healthy young male subjects (22.4±3 yr, 73.5±9 kg, 1.79±0.05 m) voluntarily participated. The study employed a randomized counter-balanced, cross-over design where each subject completed a resting biopsy (*vastus lateralis*) and one biopsy 3h after either HI-RE, HIEE or LIE-BFR, separated by one week. The exercise session of HI-RE was composed by 4 sets of 10 repetitions leg press exercise (45° leg press) at 70% of 1-RM, HI-EE was 30 min of continuous cycling at a power output that elicited ~70% of individual VO2peak while LIE-BFR was composed for 15 min continuous cycling with a cuff strapped (80% of the maximum tibial arterial pressure) over the thigh at a power output that elicited 40% of VO2peak. The mRNA expression was assessed using a One-way ANOVA followed by Tukey. **RESULTS**: All PGC1-α isoforms, PGC1-α1, PGC1-α2, PGC1-α3 and PGC1-α4 increased significantly ($P<0.0001$) above resting levels, HI-RT and LIEBFR after HI-EE. **CONCLUSION:** In summary, PGC1-α1, PGC1-α2, PGC1-α3 and PGC1-α4 were highly increased after HI-EE compared to LIE-BFR after HI-EE.

Key words: Exercise, PGC1-α1, PGC1-α4.