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Change in Levels of Circulating Angiogenic Proteins in Response to an Acute Bout of HIFT

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High Intensity Functional Training (HIFT) includes multimodal movements emphasizing functional outcomes. While the number of individuals participating in HIFT has increased, little is known about the acute and chronic changes it triggers. Exercise can induce micro-trauma to the muscle that is followed by a well-orchestrated systemic and local response that allows skeletal muscles to properly regenerate and adapt to the stimulus. This response involves the activation of circulation factors involved in angiogenesis. While previous studies have evaluated changes in levels of circulating angiogenic factors in response to an acute bout of exercise, no study has evaluated the responses due to HIFT. **PURPOSE:** to evaluate changes in circulating levels of angiogenic proteins in response to an acute bout of HIFT. **METHODS:** Recreationally active men (n = 7) and women (n = 6) (age: 27.1 $\pm$ 9.2 years and body mass index: 23.6 + 2.5 Kg/m^2) completed four sets of a dynamic exercise bout consisting of high-intensity movements targeting eccentric contraction of the lower extremity. Plasma samples were collected before exercise (pre), 15 min post- (post) and 24 h post-completion (24h) of the training session and frozen until analysis using the Angiogenesis 18-Plex Human Panel which allowed simultaneous evaluation of 18 different proteins in each sample. **RESULTS:** Subjects completed the workout in 23.4 $\pm$ 5.3 minutes. We reported an increase in bone morphogenetic protein-9 (BMP-9) from pre vs. post (45% increase, p=0.02), while three other proteins showed a decrease from pre vs. post [platelet endothelial cell adhesion molecule-1 (PECAM-1): 25%, p=0.01; vascular endothelial growth factor-A: 19%, p=0.03; Tie-2: 39%, p=0.001]. Leptin levels increased by 37% (p=0.01) from post vs. 24h. Three proteins showed an increase from pre vs. 24h (epidermal growth factor: 33%, p=0.02; granulocyte colony-stimulating factor: 29%, p=0.01; vascular endothelial growth factor-D: 34%, p=0.02), while two proteins showed a decrease (PECAM-1: 19%, p=0.004; lymphatic vessel endothelial receptor-1: 13%, p=0.02). **CONCLUSION:** Our results suggest that acutely (pre vs. post), HIFT induces a systemic decrease in angiogenic circulating factors (BMP-9 has been shown to be both pro- and anti-angiogenic). Additionally, our data shows that HIFT induces varied responses in levels of different proteins from pre vs. 24h. **SIGNIFICANCE/NOVELTY:** This is the first report evaluating the acute changes in levels of multiple angiogenic proteins in response to HIFT.

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