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TNF- α PRODUCTION IN LPS-STIMULATED WHOLE BLOOD CULTURES IN OBESE ADULTS IS DECREASED AFTER 3-WEEK OF HIGH-INTENSITY INTERMITTENT TRAINING

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INTRODUCTION

Obesity is characterized by pro-inflammatory condition, with high levels of tumor necrosis factor – alpha (TNF- α) especially released by macrophages and monocytes (CD14) pathway lipopolysaccharide (LPS) from Gram-negative bacteria-binding to receptor Toll-like receptor 4 (TLR4). The excess of TNF- α can trigger insulin resistance that increases lipolysis, leading to accumulation of free fatty acids in the bloodstream, which can induce cardiovascular diseases. Exercise has been effective to decrease both TNF- α and TLR4 independently of weight loss. However, it is not known if the intensity of exercise can influence this response.

AIM

To compare the effectiveness of two different types of aerobic exercise performed during three weeks in the production of TNF- α stimulated by LPS in whole blood in response to short-term training.

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METHODS

12 sedentary obese men (age: 30.9 $\pm$ 5.1 years; BMI: 35.2 kg/m²; VO_{2peak}: 36.26 $\pm$ 4.9 mL/kg/min) were randomized into two different groups with isocaloric training protocols

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(291.5 ± 32.8 Kcal): HIIT (10 bouts of 1-min at 100% $\text{VO}_{2\text{peak}}$: 1-min passive recovery) or moderate intensity continuous training (MICT) at 65% $\text{VO}_{2\text{peak}}$. Blood samples were collected after overnight fasting at baseline and after three weeks. We used whole blood in short time (1h) LPS-stimulated cultures for analyses of TNF- α levels. Independent t-test compared delta percentages ($\Delta\%$) of blood samples in HIIT and MICT.

RESULTS

We found an effect between groups regarding $\Delta\%$ of TNF- α (HIIT versus MICT: -27.8 ± 25.8 versus 47.3 ± 63.8 ; $t=2.466$; $p=0.033$).

CONCLUSION

HIIT (but not MICT) was able to decrease levels of TNF- α after nine sessions of isocaloric exercise. This finding could be explained by different intensities of exercise, since the organism is trying to adjust to the new metabolic stimuli.