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WHAT IS THE EFFECT OF A FAST FOOD VERSUS A MEDITERRANEAN MEAL IN THE ADIPOKINE RESPONSE TO AN EXERCISE CHALLENGE?

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BACKGROUND

Adipose tissue-derived adipokines are pro-inflammatory cytokines thought to be involved in metabolic-related diseases. Obesity and poor diet can affect levels of adipokines. Acute exercise challenge can also influence the adipokine, myokine and adipo-myokine response. We aimed to compare the effect of a Mediterranean (MdM) vs. fast food meal (FFM) on the response of adipokines to an acute exercise challenge.

METHODS

In a double blinded cross over trial, 46 participants were randomly assigned to eating one of two standardized iso-energetic meals: a FFM including a burger, French fries and Cola or a MdM, comprised of vegetable soup, pasta, tomato, olive oil, herbs, garlic, bread, sardines, fruit and water. Three hours after eating the meal, participants completed a tread-

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mill exercise test (EC). After a seven day wash out period, the intervention was repeated with the opposite meal. Blood samples were obtained before and after each meal, and immediately after the EC. Demographic, anthropometric characteristics, moderate-to-vigorous physical activity, dietary intake during wash out period and serum cortisol were assessed and included as potential confounders. Blood level of adipokines were determined by a Luminex magnetic bead immunoassay, with a human adipokine panel (HADK1MAG-61K, EMD Millipore®) that included Adiponectin, Resistin, PAI-1, Lipocalin-2/NGAL and Adipsin. Wilcoxon signed rank test applied to compare changes before/after meal and before/after EC. A linear mixed model (LMM) was used to evaluate the effect of meals on the adipokine response to exercise.

RESULTS

Thirty-nine participants (mean age 25 years) completed the trial (56% females). There were no differences in oxygen consumption, carbon dioxide production or respiratory exchange ratio during EC. The post EC heart rate was higher in the group who ate the FFM ($p=0.001$). In both intervention arms there was a statistically significant reduction of adipsin after each meal (Variation MdM -234.3(-1099.8;197.7); Variatin FFM -304.5(-623.7;-100.42), with no difference between groups $p=0.936$). After the EC, adipsin, lipocalin, PAI-1 and resistin, significantly increased in both intervention groups. Results did not differ between meals. Using a LMM, adjusted for confounders, when EC was preceded by a MdM there was a higher increase in adipsin serum levels. PAI-1 and resistin results were similar after adjusting for potential confounders.

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CONCLUSION

A pre-exercise Mediterranean meal potentiates the increase of adipsin after treadmill exercise test, which possibly relates to the immune regulatory role of adipsin; nevertheless, an increase in adipsin levels has recently been correlated with an improvement of α cell function. Adipsin, PAI-1 and resistin increased after an exercise challenge. This response might vary accordingly to the type and intensity of exercise, therefore should be considered when assessing the adipokine responses to acute or long term exercise interventions.