Changes in the relationships between aerobic capacity and hematological variables after a diet and exercise intervention

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Introduction: The relationships between maximum oxygen uptake (VO2max) and hematological variables related to oxygen transport are obviously established, but it is unknown if these associations are different between responders and non-responders to VO2max. The aim of this study was to evaluate whether VO2max relates to hemoglobin and hematocrit measured before and after a weight loss program (WLP) intervention, in responders and non-responders to VO2max. Methods: One hundred eighty-six overweight (W) and obesity (O) (body mass index [BMI] 25-34.9 kg/m2), aged from 18 to 50 years, performed an incremental test until exhaustion on a treadmill, using a modified Bruce protocol, before (pre) and after (post) the 22 weeks of diet and exercise intervention. Blood samples were taken to measure hematological parameters (H). Responders to VO2max were defined as those who achieved an increase higher than 5% in VO2max and non-responders those who achieved less than 5%. Relationships between VO2max, hemoglobin and hematocrit were measured using Pearson’s correlation coefficient in responders and non-responders. The significant level was set at 0.05. Results: Maximum oxygen uptake was associated with hemoglobin in non-responders, both pre intervention (r=0.574, p<0.001) and post intervention (r=0.596, p<0.001). There was also a positive relationship between VO2max and hemoglobin in responders, even though this association was greater both pre and post intervention (r=0.754, p<0.001; r=0.623, p<0.001, respectively). Non-responders had lower correlations between VO2max and hemocrit than responders pre weight loss program (WLP) (r=0.574, p<0.001; r=0.723, p<0.001, respectively), while the relationship was similar in both groups post WLP (r=0.567, p<0.001; r=0.555, p<0.001). Discussion: Applying Fick’s law, these results suggest that the improvements in VO2max obtained post WLP in responder group could be due to an increase in the use of carbohydrate intake during the race, and finish time. Finish time was also associated with rate of nutritional intake. Additional research is warranted on potential genetic factors (analysis forthcoming) and on the effect of increasing nutritional intake to current recommendations up to 90 g multi-transportable carbohydrate/h. Jeukendrup A (2011). J Sports Sci, 29(sup1), 591-99.

Sex differences in the effects of mental work and moderate-intensity physical activity on energy intake in young adults

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The aim of this study was to examine the acute effects of mental work and moderate-intensity physical activity on various components of energy balance in young and healthy adults. With the use of a randomized crossover design, 35 participants aged 24±3 years completed three 45-min conditions, namely (i) resting in a sitting position (control), (ii) reading-writing (mental work [MW]), and (iii) exercising on a treadmill at 40% of peak oxygen uptake (exercise), followed by an ad libitum lunch. The endpoints were spontaneous energy intake (EI), energy expenditure (EE), appetite sensations, and EI for the remaining day. We observed that the energy cost of the control and MW conditions was about the same whereas the exercise condition increased EE to a greater extent in men than women. Exercise induced a decrease in EI relative to EE compared to the control condition that was more pronounced in men than women. However, women tended to increase their energy intake after the MW condition compared to the control one whereas an opposite trend was observed in men. None of the appetite sensation markers differed significantly between both sexes. In conclusion, men and women have specific food intake patterns when submitted to cognitive and physical stimuli.

Association between objectively measured physical activity and serum 25-hydroxyvitamin D concentration in Japanese adults

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Introduction: Although some studies have found an association between physical activity (PA) and serum vitamin D status, most of these studies assessed PA using self-reported measures. Self-reported PA measures are subject to social desirability and recall biases and are inability to accurately assess unstructured and incidental PA. Less is known about the association between objectively measured PA and serum vitamin D status. This may represent one reason why associations of PA with serum 25-hydroxyvitamin D [25(OH)D] levels show weak and inconsistent results. The aim of this study was to examine the association of accelerometer-based PA levels with serum 25(OH)D concentration in Japanese adults. Methods: Ninety participants aged 20–69 years took part in this study (57 females and 33 males), and their blood samples were collected at the same laboratory in April. Serum 25(OH)D concentration measured by ELISA, was defined as sufficient (>75 nmol/L), insufficient (50 < 75 nmol/L), or deficient (< 50 nmol/L. PA was measured by accelerometry, and