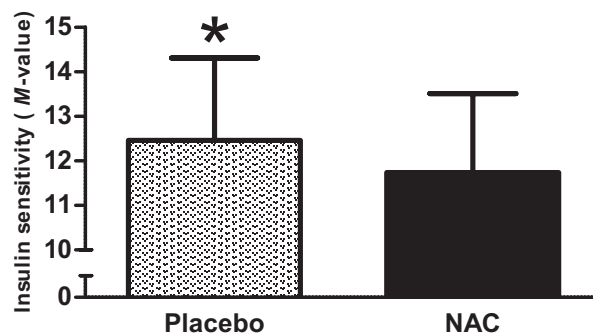


## N-acetylcysteine decreases insulin sensitivity after moderate intensity exercise

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This study examined the effect of the antioxidant N-acetylcysteine (NAC) on acute insulin sensitivity after exercise in seven young, healthy participants. Moderate intensity aerobic exercise increases acute insulin sensitivity (Hawley & Lessard, 2008; Howlett *et al.*, 2008) and recent evidence has suggested that regular antioxidant supplementation ablates the increase in insulin sensitivity seen through a structured exercise program (Ristow *et al.*, 2009). This study thus seeks to test if an antioxidant can alter insulin sensitivity after a single bout of exercise. Seven untrained, healthy participants ( $22.1 \pm 3.2$  years of age, BMI:  $24.8 \pm 3$  kg.m<sup>-2</sup>, VO<sub>2</sub> peak,  $50.6 \pm 4$  ml/kg/min) underwent a blind crossover study design, consisting of two identical trials separated by ~14 days. In each trial NAC or saline was intravenously infused before and during sub-maximal exercise for a total of 95 minutes (62.5 ml/kg/min for 15 min, followed by 25 ml/kg/min for 80 min). During this infusion time, the participant underwent 35 minutes of passive rest, followed 60 minutes of sub-maximal exercise (55 min at 68% VO<sub>2</sub> peak followed by 85% VO<sub>2</sub> peak for five min) on an electronically braked cycle ergometer. After three hours rest, a hyperinsulinemic euglycemic insulin clamp was used to determine insulin sensitivity *via* a modified M-value (glucose infusion rate/ mean insulin concentration). NAC infusion during exercise resulted in ~5.8% decrease in insulin sensitivity post-exercise (Figure,  $p = 0.041$ ).



This research demonstrates that NAC alters insulin sensitivity after a single bout of intensified exercise. These data also suggest that reactive oxygen species produced during exercise have a role increasing post-exercise insulin sensitivity.

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