

POSTER 75

PHYSICAL INACTIVITY RAPIDLY ALTERS GLYCEMIC CONTROL IN YOUNG, LEAN, PREVIOUSLY ACTIVE VOLUNTEERS

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Postprandial hyperglycemia is a better predictor of cardiovascular disease and all cause mortality than fasting blood glucose or hemoglobin A1c. Physical inactivity is associated with insulin resistance and cardiovascular disease. To determine whether transitioning from a high to low level of physical activity affects glycemic control, we equipped young (30 ± 1 y), lean (24 ± 1 kg·m⁻²), healthy, physically active ($>10,000$ steps·d⁻¹) volunteers (N=10) with continuous blood glucose monitors for 3 days during separate ACTIVE (habitual physical activity) and INACTIVE ($\leq 5,000$ steps·d⁻¹) phases (diet replicated across phases). During the INACTIVE phase, physical activity decreased $15,758 \pm 1,103$ to $4,334 \pm 294$ steps·d⁻¹, fasting blood glucose did not change (84 ± 3 to 87 ± 1 mg·dL⁻¹), fasting insulin increased (4 ± 1 to 6 ± 1 μ IU·mL⁻¹; $p = 0.02$), and, when blood glucose responses to all meals were pooled, the amplitude of glycemic excursions (post- minus pre-meal blood glucose; an index of glycemic control) increased at 30 (16 ± 4 to 30 ± 4 mg·dL⁻¹; $p = 0.02$) and 60 min (8 ± 2 to 22 ± 5 ; $p = 0.04$) post-meal. We conclude that brief reductions in physical activity rapidly diminish glycemic control in young, lean individuals, suggesting physical inactivity may 1) play a role in the development of insulin resistance, 2) affect glycemic control prior to changes in fitness and adiposity, and 3) be a useful tool to study early events in the etiology of insulin resistance. Support: MU iCATS, T32 AR048523 (CRM), VHA CDA (JPT).