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The effects of resistance exercise on insulin sensitivity in adolescents

PEDIATRICS

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n escalating incidence of type 2 diabetes among adolescents is thought to be sparked by rising population-wide prevalence of insulin resistance. Resistance exercise has been shown to reduce insulin resistance, however only immediate, postintervention effects have been demonstrated. The purpose of this study was to assess the effects, up to six months, of resistance exercise on insulin sensitivity, cardiorespiratory fitness, muscle strength, activity levels, and anthropometric measures among adolescents with insulin resistance. Participants, recruited from a chronic disease prevention program, completed a physiotherapist-supervised 10-week resistance exercise program, 60-minutes, three times per week. A body positive approach was used focusing on health behaviours. Using a repeated-measures design, participants were assessed during a control period then at pre, post, and 6-month follow-up assessments. The primary outcome was insulin sensitivity, measured by the oral glucose tolerance test. Secondary outcomes included cardiorespiratory fitness, muscle strength, activity level, and anthropometric measures. Thirteen participants (14.16±1.19 years old; 8 males, 5 females) completed the intervention. Improvements in insulin sensitivity were found, observed as reduced fasting insulin [F(2,22)=7.54, p=0.003,  $\eta p = 0.41$ ], fasting glucose [F(2,22)=3.58, p=0.045, np2=0.25], and HOMA-IR [F(2,22)=7.60, p=0.003, np2=0.41], which were maintained at follow-up. Cardiorespiratory fitness, waist circumference, and waist-to-hip ratio significantly improved at post and follow-up. The findings suggest that a supervised 10-week resistance exercise program improves insulin sensitivity, cardiorespiratory fitness, waist circumference, and waist-to-hip ratio in adolescents who are at high risk of developing type 2 diabetes. Importantly, these benefits are maintained up to six months. Supervised, resistance exercise adds significant long-term benefit in the management of insulin resistance in adolescents.

## Biography

Sarah Critch is the Physiotherapist with the Janeway Lifestyle Program at the Janeway Children's Health and Rehabilitation Centre, Eastern Health. She obtained a Master's of Science in Medicine (Clinical Epidemiology) from Memorial University, a Bachelor's degree in Kinesiology (Honours) from Memorial University, and a Bachelor's degree in Science (Physiotherapy) from Dalhousie University.

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