**Abstract**

Background: GlycA is a composite measure of systemic inflammation that integrates both the protein levels and glycosylation states of the most abundant acute phase proteins in the circulation. In adults, GlycA predicts cardiovascular events and all-cause mortality. Obese youth with prediabetes are at increased risk for premature morbidity and mortality through multiple mechanisms, including increased systemic inflammation. Whether lifestyle intervention can reduce GlycA levels in high-risk populations has not been established. The purpose of the current study is to examine the effects of a lifestyle intervention on GlycA levels among obese, prediabetic Latino youth.

Methods: Obese, prediabetic Latino youth (n=24; 15.6 ± 1.3 years, 11 male/13 female) completed a 12-week lifestyle intervention that included weekly nutrition education sessions and moderate to vigorous physical activity sessions three times a week. Prediabetes was characterized by an expanded definition of impaired glucose tolerance, using 2-hour glucose ≥ 120 mg/dL after an oral glucose tolerance test. Outcomes assessed at baseline and 12 weeks included BMI, GlycA (measured using nuclear magnetic resonance spectroscopy), 2-hour post-challenge glucose, and fasting cholesterol panel.

Results: The lifestyle intervention resulted in significant reductions in BMI (34.9 ± 5.3 kg/m² to 34.0 ± 5.3 kg/m², p=0.001), total cholesterol (153.4 ± 28.1 mg/dL to 141.9 ± 25.8 mg/dL, p=0.002), and 2-hour glucose (141.5 ± 31.3 mg/dL to 113.8 ± 31.3 mg/dL, p=0.001). GlycA decreased by 7.5% (448.3 ± 52.8 μmol/L to 414.6 ± 49.3 μmol/L, p=0.001).

Conclusion: A 12-week lifestyle intervention significantly decreased GlycA levels in obese, prediabetic adolescent Latinos. Healthy lifestyle modifications among high-risk youth may decrease future risk of cardiometabolic disease through improvements in traditional risk factors as well as decreasing systemic inflammation.

**Lifestyle Intervention Improves GlycA a Novel Biomarker of Inflammatory CVD among Obese, Prediabetic, Adolescent Latinos**

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**Introduction**

- Obese children have an increased prevalence of cardiovascular risk factors during childhood as well as an increased risk of mortality from cardiovascular events during adulthood.
- Hyperglycemia and systemic inflammation are additional independent risk factors for CVD. GlycA is a novel marker of systemic inflammation and predicts cardiovascular events in longitudinal adult cohorts.
- It is not known whether lifestyle interventions are effective in reducing GlycA levels in pediatric or adult populations.

**Methods**

- Participants: 24 obese (BMI >95th percentile), prediabetic Latino adolescents (age 14-16).
- Prediabetes was characterized by an expanded definition of impaired glucose tolerance, using 2-hour glucose ≥ 120 mg/dL after an oral glucose tolerance test.
- 12-week lifestyle intervention delivered at a local YMCA.
- Weekly nutrition education classes delivered by bilingual/bicultural health educators to groups of families in addition to moderate-vigorous exercise 3 times/week.
- Outcomes assessed at baseline and 12 weeks included BMI, GlycA (measured using nuclear magnetic resonance spectroscopy), 2-hour post-challenge glucose, and fasting cholesterol panel.

**Results**

**GlycA Levels Pre and Post Lifestyle Intervention**

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**Within-Subject Repeated Measures Correlation Between GlycA and Other CVD Risk Factors**

- Correlation: 0.66, P < 0.001
- Triglyceride: 0.37, P = 0.086
- Non-HDL: 0.39, P = 0.063
- BMI: 0.49, P = 0.018

**Changes in 2-hour Glucose and GlycA by Participant**

**Conclusion**

- Systemic inflammation, as measured by GlycA level, was improved by a 12-week lifestyle intervention in obese, prediabetic adolescent Latinos.
- The improvement in GlycA was strongly correlated with decreases in 2-hour glucose.
- Healthy lifestyle interventions in high-risk youth improved multiple CVD risk factors, including systemic inflammation, and may lead to a decreased risk of future cardiometabolic disease.

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