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D-lactate and Low Molecular AGEs Are Elevated in Obese Adolescents: Evidence for Carbonyl Stress in Adolescent Obesity

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replicability of the results. 43.2% were overweight and 16% of all participants had dyslipidemia. Most vitamins responded positively and many clinical parameters changed in directions consistent with improved metabolic health to the intervention (fasting levels of LDL-c and glucose decreased). Simple and multivariate statistical models showed that starting baseline levels of any metabolite predicted response of that same metabolite to the intervention and predicted response to intervention on the basis of multiple vitamin/clinical baseline measures. Linear regressions between ancestral components and baseline vitamin levels show lower TMP with a higher percentage of European ancestry. Lower vitamin B_{12} and folate levels were associated with a higher percentage of Native American ancestry as was folate response to intervention. The experimental design, computational methods, and results are a first step toward developing targeting recommendations for optimizing circulating vitamin levels and clinical parameters related to health.

Poster Presentations

D-lactate and Low Molecular AGEs are Elevated in Obese Adolescents: Evidence for Carbonyl Stress in Adolescent Obesity

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Abstract

Glycation and carbonyl stress produced by methylglyoxal (MG) as a consequence of triose flux in glycolysis has been implicated in the etiology of metabolic syndrome and diabetes complications. An integrated estimation of MG flux is provided by measuring concentrations of its catabolite D-lactate in serum. However, no studies have explored the pathway in childhood obesity.

Objective: Study serum concentrations of D-lactate and low molecular weight advanced glycation end-products (LMW-AGE) in lean vs adolescents with obesity.

Material and Methods: We conducted a cross-sectional study of 30 lean and 30 obese adolescents between the ages of 15-19 years. D-lactate was measured kinetically in serum ultrafiltrates by an adaptation of a colorimetric method from Sigma. Total and LMW-AGEs were measured by fluorescence (Excitation: λ 370 nm, Emission: λ 440 nm). The Ethical Committee of the Institution approved this study and informed consent was obtained from the participant adolescents and their parents.

Results: The obesity group showed significantly (* $p < 0.01$, ** $p < 0.001$) higher levels of: % body fat 35.0 ± 9**, systolic BP 116.0 ± 8.1 mmHg** and diastolic BP, 72.9 ± 7.1*mmHg, waist 96.1 ± 11.6 cm** and hip circumferences 110.2 ± 8 cm**, HbA1c 5.1 ± 0.6*. D-lactate was 4.5 +/- 2.5 nmol/l in controls vs 7.4 +/- 4.2 vs. nmol/l in obese subjects **. LMW/total AGE were 0.48 (0.44-052) AU in controls vs 0.61 (0.55-0.67) AU in obese subjects**.

Conclusions: D-lactate levels and LMW-AGEs are higher (64% and 27% respectively) in adolescents with obesity as compared to lean controls. Our data is compatible with the presence of an increased production of MG associated with protein modification that results in LMW-AGE (partial proteolysis of AGE proteins) increases in serum. This increased carbonyl stress may be of etiological significance. Sources of Research Support: Project supported by DAIP Universidad de Guanajuato (project 011/2015) and Touro University

Feeding Schedule does not Play a Role on Energy Homeostasis in Rats

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Abstract

Evidence in mice indicates that limiting food access to the active phase, termed time-restricted feeding (TRF), can prevent diet-induced obesity without the necessity of reducing food intake (FI). We compared TRF with pharmacological treatment using Melanotan 2 (MTII), an appetite suppressor that decreases FI and body weight. We hypothesized that TRF would be as efficacious as MTII and that morning MTII treatment would be more efficacious than evening MTII. High-fat fed rats (6/group) treated with vehicle; MT II at ZT 0 (beginning of light phase) and vehicle ZT 12; or vehicle at ZT0 and MTII at ZT