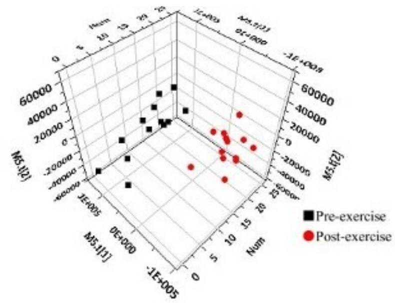
RESULTS: After training, the body fat percentage, 2-hour OGTT plasma glucose, and low density lipoprotein cholesterol of PDM patients were significantly reduced (by 4.6%, 16.22% and 9.27%, on average). The metabolic characteristics were significantly different before and after exercise, there were 31 endogenous metabolites (VIP > 1 and P < 0.05), of which 25 were increased and 6 were decreased. Main metabolites that changes with training included phosphatidylcholine, lysophosphatidylcholines, sphingomyelin, betaine, linoleic acid,oleic acid and docosahexaenoic acid.

CONCLUSION: Aerobic exercise intervention has a marked effect on the plasma metabolites in PDM patients, which can improves the glucose and lipid metabolism by regulating the metabolic pathway of linoleic acid and phospholipid. These findings may lead to a better understanding of the mechanism of aerobic exercise in preventing T2DM. Supported by Key Projects of State General Sports Administration of China (2014B007),Specialized Research Fund for the Doctoral Program of Higher Education of China (20131112110002).



PLS-DA models of LC/MS metabolomics data for pre and post exercise

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989 Board #250 May 30 2:00 PM - 3:30 PM

A Curious Relationship Between Obesity, Diabetes, and Dementia

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(No relevant relationships reported)

Among American adults (age ≥ 18), 36.5% have obesity, 9.3% have diabetes, and more than 4 million have dementia. These pathologies do not develop and progress independently. Compared to adults with a body mass index (BMI) less than 23, overweight adults (BMI>25) have a 10-fold increase in the odds of developing diabetes. In turn, body weight and diabetes appear to exert independent effects on the risk of dementia. More work is necessary to elucidate these relationships.

PURPOSE: To assess the effects of obesity and diabetes on incidence of dementia.

METHODS: We analyzed a hospital population that included 2,306 consecutively admitted patients. We conducted a health history, diagnosed cerebral, metabolic, and cardiovascular diseases, and measured anthropometric and cardiometabolic parameters. Chi-square tests analyzed rates of dementia among patients with and without obesity and diabetes. Logistic regression tested the effects of obesity and diabetes on odds of a dementia diagnosis, holding constant potential confounders.

RESULTS: Across the total sample, 16.3% of patients were obese, 14.3% had diabetes, and 4.6% had dementia. Among obese patients, 26.0% had diabetes; 12.0% of non-obese subjects had diabetes (p<0.001). Among obese patients, 1.6% had dementia; 5.1% of non-obese patients had dementia (p=0.003). Among patients with diabetes, 8.8% had dementia; 3.8% of patients without diabetes had dementia (p<0.001). Logistic regression, holding age and history of stroke constant, found trends for obesity to reduce odds of dementia by 56% (p=0.079) and diabetes to increase odds by 63% (p=0.060). Sex (p=0.418), depression (p=0.608), mean arterial pressure (p=0.837), smoking status (p=0.920), and histories of heart attack (p=0.250), congestive heart failure (p=0.627), and peripheral vascular disease (p=0.943) were not significant. Among patients age ≥ 65 (n=724), 13.8% were obese, 27.2% had diabetes, and 14.0% had a diagnosis of dementia. The same logistic regression preserved its trends for obesity (OR=0.376; p=0.054) and diabetes (OR=1.600; p=0.079).

CONCLUSIONS: Obesity appears to carry a protective role, lowering risk of dementia, while diabetes elevates risk. Given the absence of a relationship with vascular disease, this is more likely a consequence of glucose, insulin, and amyloid metabolism.

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990 Board #251 May 30 2:00 PM - 3:30 PM

The Dose Effect of Whey Protein on Insulin Responses in Pre-Diabetic and Type 2 Diabetics

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(No relevant relationships reported)

BACKGROUND: People with pre-diabetes and type 2 diabetes have shown an increase in insulin secretion after ingesting 55 g of whey protein coupled with a glycemic challenge. However, the effect of lower amounts of whey protein on insulin responses remains unclear. Our hypothesis was that both 20 g and 30 g of whey consumption prior to an oral glucose tolerance test (OGTT) would produce an increase in insulin secretion, with 30 g producing the greatest increase compared to a control.

PURPOSE: The purpose of this study was to examine the effect of two different doses of whey protein ingested 30 min prior to a 50 g OGTT on glucose, insulin, C-peptide, and glucagon responses.

METHODS: Diabetic or pre-diabetic participants (n=9, mean ± SD; age: 64.3 + 8.1 yrs; BMI: 29.4 + 6.0 kg/m^2; body fat percentage: 42.5 + 7.8 %; fasting plasma glucose: 6.9 ± 1.2 mmol/l; HbA1c: 6.4 ± 0.6 %) completed three trials. The randomly assigned trials consisted of: 250 ml of water (CON), 250 ml of water + 20 g whey (20g), and 250 ml of water + 30 g whey (30g), followed by an OGTT. Blood was collected at -30, 0, 15, 30, 60, 90, 120, and 150 min for the measurement of glucose, insulin, C-peptide, and glucagon. The whey protein mixture was administered immediately following the -30 min blood draw, and the 50 g OGTT began immediately following the 0 min blood draw. Glucose was analyzed using a YSI 2900D glucose analyzer and insulin, C-peptide, and glucagon were measured via multiplex fluorescent detection (MagPix). A one-way repeated measures ANOVA (p<.05) with a Bonferroni post hoc was used for statistical analysis for each dependent variable.

RESULTS: Integrated area under the curve (AUC) for glucose presented no difference between the 3 trials. Insulin AUC was significantly increased from CON to 20g (p=0.004, 36.3%), CON to 30g (p=0.002, 61.7%), and 20g to 30g (p=0.030, 18.6%). C-peptide and glucagon AUC significantly increased from CON to 20g (p=0.018, 20.6%; p=0.046, 33.1%) and CON to 30g (p=0.001, 30.1%; p=0.017, 33.7%).

CONCLUSION: Whey protein elicited a dose response on plasma insulin, increasing concentrations from CON to 20g, and 20g to 30g, however plasma glucose was unaffected. 20g and 30g displayed similar responses for glucagon. Neither 20 g nor 30 g of whey protein may be adequate to provide glycemic improvement in the disease management of type 2 or pre-diabetes.