

630: Metabolic effects of short-term whey protein supplementation in polycystic ovary syndrome

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Objective

This study evaluated the effects of short-term whey protein ingestion on incretins and glycemic regulation in women with and without polycystic ovary syndrome (PCOS and CON respectively).

Design

Repeated measures design with convenience sampling method was used. Twenty-nine young, body mass index- matched women (PCOS=14 and CON=15) underwent 150-min oral glucose tolerance test (OGTT) without protein preload (Day 0) followed by tests on the first and last days of 1-wk supplementation (Days 1 and 7 respectively). Subjects ingested 35g whey protein per day. Eight venous blood samples were collected during each test to assess levels of glucose, insulin, active glucagon-like peptide 1 (aGLP-1) and total glucose-dependent insulinotropic polypeptide (tGIP).

Materials and Methods

Multiplex assays was used for quantification of tGIP and aGLP-1. Insulin concentrations were analyzed using ELISA. Repeated measures ANOVA with Bonferroni post hoc tests were used to compare the effects of PCOS status, time, Day and their interactions on glucose and hormone levels. P-value $\leq .05$ was considered significant.

Results

In both groups, postprandial changes in glucose levels were significantly lower on Days 1 and 7 compared to Day 0 ($p < .05$). Preloading also increased insulin levels ($p < .05$; Day 0=55.2 vs Day 1=69.9 vs Day 7=84.8 $\mu\text{IU/ml}$). Day, time ($p < .05$), and time x group ($p = .04$) interactions significantly affected insulin responses. In both groups insulin increased successively on Days 1 and 7 compared to Day 0 (Day 0=55.2 vs Day 1=69.9 and Day 7=84.8 $\mu\text{IU/ml}$). During all OGTTs CON group had higher aggregated tGIP levels compared to PCOS group ($p = .04$; 322 vs 234.8 pg/ml) whereas aGLP-1 increased significantly on days of preloading compared to Day 0 ($p = .03$) in both groups.

Conclusions

A 35g whey bolus before the glucose load enhanced insulin release and consequently lowered circulating glucose in women with and without PCOS. The insulinogenic effect of preloading can be attributed to higher aGLP-1 levels. Women without PCOS exhibited notably sustained and greater glycemic control in response to short-term protein supplementation compared to women with PCOS. The study concludes that the incretin mimetic effect of whey may aid women with PCOS in achieving glycemic homeostasis and reducing risk of type 2 diabetes mellitus.

Support

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Disclosure

None