

P18-33-26 Dietary Fat Shapes Bile Acid-Insulin Coupling in Adults With Obesity

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Objectives: Diet shapes the bile acid (BA) pool through host and microbial biotransformation, altering the primary/secondary balance, 12 α -hydroxylation, and conjugation patterns. Distinct BA species differentially influence insulin secretion via FXR and TGR5 signaling.

Methods: Twenty-four adults (age = 43.7 $\pm$ 11.3 y; BMI = 37.0 $\pm$ 6.02 kg/m²) completed a randomized, controlled, crossover, complete feeding trial consisting of three 21-day periods differing only by the addition of whole walnuts, walnut oil, or corn oil. Blood samples were collected during a 6-hour mixed-meal tolerance test at baseline (t0) and every 30 min postprandially (t30-t360). For each bile acid, we fit linear models of baseline-corrected insulin, including treatment, bile acid concentration, and time modeled as a cubic polynomial.

Results: In the corn oil condition, cholic acid (CA; 12 α -hydroxylated BA) and deoxycholic acid (DCA; 12 α -hydroxylated BA) were positively associated with insulin. These associations were attenuated in the walnut treatments, including the walnut x CA interaction (β = -0.49; p < 0.001) and the DCA x Treatment interactions for both walnuts (β = -0.16; p < 0.01) and walnut oil (β = -0.22; p < 0.01). Taurodeoxycholic acid showed significant BA x Time interactions. Glycolithocholic acid (GLCA) was treatment-invariant; higher GLCA was associated with lower insulin (β = -0.73; p < 0.01). When BA x Treatment terms were not significant, both walnut and walnut oil lowered insulin relative to corn oil (β = -19.9; p < 0.01; β = -17.65; p < 0.02). Exploratory mediation analyses did not identify statistically significant indirect effects of treatment on insulin.

Conclusions: These findings indicate that walnuts and walnut oil attenuate bile acid-insulin coupling in a bile acid-specific manner, with the strongest effects observed for 12 α -hydroxylated bile acids such as CA and DCA. The consistent Treatment x Bile Acid interactions suggest that walnuts modify bile acid-insulin coupling (moderation) rather than acting primarily on insulin through shifts in bile acid concentrations. Future analyses will integrate BA profiles with microbiome data to identify microbial drivers of diet-microbiome-host interactions.

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P18-34-26 Feasibility of Adjunctive Nutritional Therapy for Patients With Crohn's Disease Starting New Immunologic Therapy

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Objectives: Evaluate feasibility and nutritional impact of an 8-week standardized inflammatory bowel disease (IBD) diet with an oral nutrition supplement (ONS) on nutrient intake,

body composition, and fecal microbiome in adults starting immunologic therapy for a Crohn's disease (CD) flare.

Methods: In this 8-week, exploratory, open-label, 1:1 randomized study, participants starting biologics received either IBD-AID instruction (control) or IBD-AID plus ONS (Plant-based, yellow pea protein formula) at 50% of caloric needs. Dietary intake (24-hour recalls and 3-day records) captured at baseline and weeks 0-2, 2-4, and 4-8 and quantified with NDSR software. Non-hydrated lean tissue (NHLT) and fat-free mass percent (FFM%) measured via bioimpedance spectroscopy at weeks 0, 4, and 8. Data analyzed using linear mixed models (Model: Response ~ Treatment*Timepoint + (1|Participant)); treatment effects reported as estimated marginal mean difference from baseline with 95% CIs. Stool samples collected at weeks 0, 2, 4, and 8. Microbial Virulence Factors (VF) identified by k-mer alignment of metagenomic reads against MetaVF and normalized as RPKG.

Results: Twenty participants were recruited. Protein intake (g/day) improved with ONS at weeks 2 and 4 (29 [10,49] and 12 [-7.5,31.4]), but was unchanged in controls (-7.4 [-27.6,12.8] and -1.6 [-21.8,18.6]). Calorie intake followed a similar pattern: weeks 2 and 4 ONS (164 [-249, 578] and 105 [-309, 519]) and control (-234 [-662, 195] and -202 [-631, 226]). Improvements in NHLT (kg) and FFM% occurred at week 4 with ONS (2.1 [-0.7,4.9] and 2.2 [-0.6,5.0]); similar improvements delayed until week 8 in controls (3.1 [-0.1,6.2] and 2.8 [-0.3,5.8]). VF burden improved to median of 0 with ONS by week 4 (RPKG < 0.01 and 0 week 8), whereas VF burden persisted through week 8 in controls (0.79 week 4 and 0.14 week 8).

Conclusions: Patients with CD are nutritionally vulnerable due to metabolic demands and physiologic changes of chronic inflammation. Adjunctive ONS with immunologic therapy is a feasible strategy to increase nutrient intake beyond diet education alone. Accelerated improvements in body composition and microbial VF burden suggest ONS-based support may help preserve FFM and accelerate recovery in patients with CD experiencing a flare initiating new immunologic therapy.

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P18-35-26 Functional Longevity Intervention With Mediterranean Diet Improves Body Composition and Muscle Performance in Older Women in an Assisted Living Setting: A Pilot Study

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Objectives: Changes in body composition contribute to frailty in older adults. The study evaluated the feasibility and effects of the Functional Longevity Intervention With Mediterranean Diet (FLOW-MedDiet) on body composition and muscle performance in women residing in assisted living.