

## **P51 - The Effect of a Plant-Based Nutritional Supplement on Symptoms and Calorie- and Protein-Deficits in Patients With Gastroparesis**

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**Background:** Despite caloric deficient diets, greater than 50% of patients with gastroparesis have a BMI >25. Additionally, the traditional gastroparesis diet, which is low fat and low fiber, tends to be higher in carbohydrates than recommended. To explore this weight discrepancy, the aims of our study were to (1) compare metabolic needs of patients with gastroparesis using indirect calorimetry (REE) compared to their calculated total energy expenditure (TEE) and (2) determine if improving the protein deficit can improve patient symptoms.

**Methods:** Baseline and 12-week metabolic needs were measured and calculated using indirect calorimetry and dietitian assessed caloric need, respectively. Patients also underwent measurement of weight and height at baseline, 4-week, and 12-week timepoints. Gastroparesis symptoms were measured with the gastroparesis cardinal symptom index (GCSI) and the patient assessment of upper gastrointestinal disorders-symptom severity index (PAGI-SYM). Kate Farms 1.5 liquid nutritional supplement with 500 total kcal and caloric distribution of 19% Protein, 36% carbohydrate, and 45% fat was added to patients diets to meet protein and caloric needs as determined by dietitian based on height, weight and reported activity level using predicted TEE.

**Results:** Five patients consented and four completed the study (75% female, median BMI 23.9; range 22.6-42.3). The baseline REE and calculated TEE were within 100 kCal of each other in 2 of 4 patients. In the two patients with discordant metabolic calculations, the patient with a BMI of 42 had a higher REE than TEE by over 1000 kCal while the patient with a BMI of 22 had a higher TEE than REE by 288 kCal. Three patients had a protein deficit of 20% or more which equates to 14-49 grams of protein per day. These patients also consumed a caloric deficient diet. Average required nutritional supplement intake was 745 kcal corresponding to ~1.5 cartons and all patients required nutritional supplementation. After 4 weeks of therapy with a liquid nutritional supplement, all 4 patients had a reduction in their gastroparesis symptoms (GCSI). Seventy-five percent of patients had a clinically meaningful reduction in their GCSI scores (>0.5 reduction). There was also a statistically significant reduction in GCSI ( $p = 0.01$ ) and vomiting ( $p = 0.04$ ) at 4-week follow-up. Caloric and protein deficits decreased throughout the study in all patients with increase in patient weight after 12 weeks (range 1.6-4.8 kg).

**Conclusion:** This study highlights several challenges and opportunities in conducting nutrition studies in patients with gastroparesis. (1) There appears to be poor correlation between measured and calculated energy needs in patients with the gastroparesis, especially in those who are morbidly obese. (2) Caloric and protein deficiencies are common in patients with gastroparesis. These deficiencies can be corrected with use of a liquid nutritional supplement and are independent of BMI. Meeting protein requirements may reduce gastroparesis symptom burden; however, the symptom reduction may be due to consuming a more liquid diet. Larger studies are required to further confirm these findings and determine if there are differences in plant vs animal-based protein in patient outcomes.

**Financial Support:** Funding from Kate Farms and Colleen & Robert D. Haas

Karhu E, Nguyen L, Sun S, and Gardner C. P51 - The Effect of a Plant-Based Nutritional Supplement on Symptoms and Calorie- and Protein-Deficits in Patients With Gastroparesis. GI and Other Nutrition and Metabolic-Related Topics Poster Abstracts. ASPEN Nutrition Science & Practice Conference: April 20-23, 2023 (Las Vegas, NV). JPEN J Parenter Enteral Nutr. 2023 April;47(S71-246): S127-128 <https://doi.org/10.1002/jpen.2491>

Table 1. Baseline Characteristics, Metabolic Need, and Caloric Intake.

Patient	Sex	BMI	% Calorie deficit	% Protein deficit	Resting EE vs Calorie Needs at Baseline (Kcal)		
					Resting EE	Caloric need	Difference
1	F	42.3	66%	63%	2191	1100	1091
3	F	23.9	15%	39%	1215	1143	72
4	M	22.6	7%	20%	1670	1958	-288
5	F	33.3	20% excess	2%	1365	1409	-44
Mean							207.75

Table 2. Baseline, Week 4, and Week 12 Patient Weight, Nutrient Deficit, and Symptom Scores.

Patient	Baseline					Week 4					Week 12				
	Weight (kg)	GCSI	PAG-SYM	% Calorie deficit	% Protein deficit	Weight (kg)	GCSI	PAG-SYM	% Calorie deficit	% Protein deficit	Weight (kg)	GCSI	PAG-SYM	% Calorie deficit	% Protein deficit
1	111.1	3.90	3.65	66%	63%	111.7	3.68	3.23	8%	39%	114.5	3.67	2.33	7%	28%
3	55.5	3.06	2.91	15%	39%	57.1	2.42	2.89	5%	19%					
4	68.5	3.33	3.04	7%	20%	69.9	2.44	2.12	5%-excess	10% excess	71.8	2.35	1.69	3%	11%
5	83.3	2.50	2.33	20% excess	2%	87	1.54	1.35	3%	2% excess	88.7	1.67	1.85	0%	10% excess

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