

Anti-Inflammatory Diet to Enhance Post-Colectomy Quality of Life: A Pilot Study

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Introduction

Background: Quality of life challenges faced by patients with bowel diversions are frequently related to nutrition. Chief complaints include maintaining adequate hydration, absorbing vitamins and nutrients, adapting to new or altered food responses, accidental bowel leakage, Bowel movement frequency, and flatulence. Although immediate dietary suggestions are often provided during the post-surgical recovery period, longterm nutritional needs are frequently left unaddressed. Strong evidence supports the efficacy of anti-inflammatory diets in the treatment of IBS, IBD, Crohn's Disease, and Colitis (Mullin & Swift, 2011). Identifying and reducing bioindividual food irritants decreases gastrointestinal inflammation, thereby improving nutrient absorption, reducing B12 and iron deficiencies, decreasing abdominal pain/discomfort, improving energy level, and promoting increased sleep quality.

Objective: This pilot study is a preliminary assessment of the efficacy of an anti-inflammatory diet on improving the quality of life for patients with bowel diversions.

Intervention

Participants were recruited from the member list of the Hereditary Colon Cancer Foundation. They received written and verbal instruction to follow an anti-inflammatory diet for 21 days. Specifically, they eliminated dairy, gluten, corn, soy, sugar, alcohol, caffeine, and other food additives. Support materials including food lists, shopping guides and recipes were provided.

Table 1: Food List

	Green Light	Yellow Light	Red Light
Vegetables	fresh or frozen vegetables		soy beans, corn, canned veggies with additives other than salt
Fruits	all fresh fruit	dried fruit <i>Limit to 2-3x week.</i>	canned fruit with added ingredients
Protein	beans (well-cooked), lentils, nuts, seeds, rice, fish, seafood, chicken, turkey, eggs, lamb, duck, wild game, organ meat, bone broth	Beef, veal, pork <i>Limit meats from this category to 2-3x week.</i>	sausage, hot dogs, lunch meat, bacon (with nitrites/nitrates) soy protein including tofu, milk, tempeh, soy cheese, miso, imitation meats
Dairy	milk, cheese or yogurt made from sheep or goat's milk. other: homemade almond milk, rice milk, coconut milk	butter and ghee organic, plain, full fat or 2%, yogurt	Cow's milk, cheese, cream, flavored yogurt Other: soy milk, lactose-free milk, commercially made almond, coconut or rice milks
Grains	quinoa, rice, buckwheat, amaranth, millet, sorghum, teff noodles made from rice, beans, quinoa, buckwheat	gluten-free oats <i>Package must be labeled gluten-free. Limit oats to 2-3x/week.</i>	Corn meal Gluten: wheat, wheat germ, wheat flour, barley, oats, bran, rye, spelt, semolina, couscous, kamut, triticale
Snacks	nuts, nut butters, seeds, coconut based snacks, rice cakes, pickles, olives, hummus, babaganoush, homemade smoothies bars or trail mix made with only fruit, nuts and seeds (without ingredients from the red list) crackers made from seeds, nuts or rice flour, and without ingredients from the red list	potato chips made with only salt and avocado oil or olive oil	crackers, snack chips, pop corn, cookies, cakes
Sweeteners	cooked fruit	pure maple syrup, honey <i>Use to lightly sweeten.</i>	refined sugars including agave, white sugar, brown sugar, cane sugar, beet sugar, coconut sugar, corn syrup, sucrose, glucose, fructose, maltose, dextrose, succinate, sorbitol, mannitol, isomalt, xylitol, molasses, stevia
Beverages	water, green tea, herbal tea	pure fruit juice, black tea, wine	juice with added sweeteners, coffee, soda, beer, liquor
Oils, Seasonings, Condiments	virgin olive oil, ghee, coconut oil, all spices without additives, homemade salad dressing, tamari, some ketchups and mustards, miso made from chickpeas, not soybeans	butter	margarine, vegetable oil, corn oil, canola oil, rapeseed oil soy sauce, any condiment containing corn, soy, natural flavoring, citric acid, gum, soy natural flavoring, citric acid, gum, soy lecithin, baking powder
Additives in processed foods			natural flavoring, citric acid, gum, soy lecithin, baking powder

Table 2: Participants

Participant #	Sex	Diseases	Surgical Outcome
1	M	Lynch	total colectomy, J-pouch
2	F	FAP, GERD	total colectomy, ileostomy
3	F	FAP, GERD	total colectomy, J-pouch
4	F	FAP, GERD	total colectomy, J-pouch

Outcome Measures

Participants self-assessed their symptoms before and after the intervention using each of the following seven tools.

Table 3: Lichtiger Index (modified Truelove & Witts Severity Index)

Symptom	Score
Diarrhea (# of daily stools)	
0 - 2	0
3 or 4	1
5 or 6	2
7 - 9	3
10	4
Nocturnal Diarrhea	
No	0
Yes	1
Visible Blood (% of movements)	
0	0
Less than 50	1
Greater than 50	2
100	3
Fecal Incontinence	
No	0
Yes	1
Abdominal Pain or Cramping	
None	0
Mild	1
Moderate	2
Severe	3
General Well Being	
Perfect	0
Very Good	1
Good	2
Average	3
Poor	4
Terrible	5
Abdominal tenderness	
None	0
Mild and Localized	1
Mild to Moderate and Diffuse	2
Sever or Rebound	3
Need for Antidiarrhea Drugs	
No	0
Yes	1

Table 4: Medical Symptoms Chart

Rate each of the following symptoms based on the past 30 days .
0= Never
1= occasionally, mild
2= occasionally, severely
3= frequently, mild
4= frequently, severe

HEAD SYMPTOMS - PHYSICAL

- | | |
|--|--|
| <input type="checkbox"/> faintness | <input type="checkbox"/> hair loss |
| <input type="checkbox"/> acne | <input type="checkbox"/> dark circles under eyes |
| <input type="checkbox"/> swollen/puffy eyes | <input type="checkbox"/> blurred vision |
| <input type="checkbox"/> dizziness | <input type="checkbox"/> yellowish tint in eyes |
| <input type="checkbox"/> watery/itchy eyes | <input type="checkbox"/> itchy ears |
| <input type="checkbox"/> headaches | <input type="checkbox"/> hearing loss |
| <input type="checkbox"/> earaches | <input type="checkbox"/> coated tongue |
| <input type="checkbox"/> ringing in ears | <input type="checkbox"/> mouth sores |
| <input type="checkbox"/> sinus infections | <input type="checkbox"/> faintness |
| <input type="checkbox"/> sore throat | <input type="checkbox"/> chronic cough |
| <input type="checkbox"/> phlegm in throat | <input type="checkbox"/> sneezing attacks |
| <input type="checkbox"/> itchy nose | <input type="checkbox"/> stuffy nose |
| <input type="checkbox"/> runny nose | |
| <input type="checkbox"/> swollen/discolored tongue | |

HEAD SYMPTOMS - MENTAL

- | | |
|---|---|
| <input type="checkbox"/> foggy brain | <input type="checkbox"/> poor concentration |
| <input type="checkbox"/> mood swings | <input type="checkbox"/> anger, irritable |
| <input type="checkbox"/> depression | <input type="checkbox"/> anxiety, nervousness |
| <input type="checkbox"/> fatigue/low energy | <input type="checkbox"/> lethargic |
| <input type="checkbox"/> poor memory | |

BODY SYMPTOMS

- | | |
|--|--|
| <input type="checkbox"/> muscle weakness | <input type="checkbox"/> joint aches |
| <input type="checkbox"/> stiffness | <input type="checkbox"/> arthritis |
| <input type="checkbox"/> muscle pain | <input type="checkbox"/> hives |
| <input type="checkbox"/> heart racing | <input type="checkbox"/> heart pounding |
| <input type="checkbox"/> chest pain | <input type="checkbox"/> shortness of breath |
| <input type="checkbox"/> asthma | <input type="checkbox"/> bronchitis |
| <input type="checkbox"/> rapid weight gain | <input type="checkbox"/> rapid weight loss |
| <input type="checkbox"/> faintness | |

SLEEP SYMPTOMS

- | | |
|--|---|
| <input type="checkbox"/> insomnia | <input type="checkbox"/> wake to use bathroom |
| <input type="checkbox"/> difficulty falling asleep | <input type="checkbox"/> restless sleep |
| <input type="checkbox"/> feel tired upon waking | |

GASTROINTESTINAL SYMPTOMS

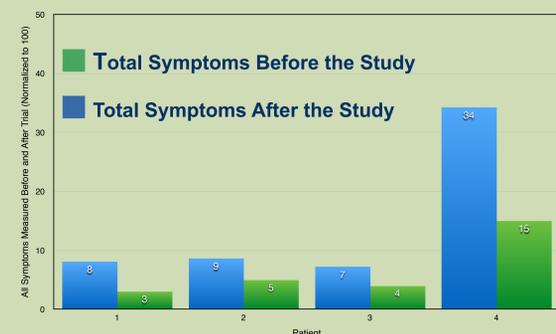
- | | |
|---|--|
| <input type="checkbox"/> indigestion | <input type="checkbox"/> burping |
| <input type="checkbox"/> bloated | <input type="checkbox"/> cramps |
| <input type="checkbox"/> stomach spasms | <input type="checkbox"/> feel like food sits heavy |
| <input type="checkbox"/> get full quickly | <input type="checkbox"/> pain |
| <input type="checkbox"/> bad taste in mouth | <input type="checkbox"/> full blockage |
| <input type="checkbox"/> partial blockage | <input type="checkbox"/> gassy |
| <input type="checkbox"/> nausea | |
| <input type="checkbox"/> feel hungry 1-2 hours after meal | |

STOOL SYMPTOMS

- | | |
|--|---|
| <input type="checkbox"/> diarrhea/loose stool | <input type="checkbox"/> constipation |
| <input type="checkbox"/> undigested food | <input type="checkbox"/> mucus in stool |
| <input type="checkbox"/> rectal pain | <input type="checkbox"/> rectal/stoma itching |
| <input type="checkbox"/> blood in stool | <input type="checkbox"/> accidental bowel leakage |
| <input type="checkbox"/> stool consistency changes throughout day | |
| <input type="checkbox"/> 3 or more bowel movements/day | |
| <input type="checkbox"/> feel continuous need to have bowel movement | |

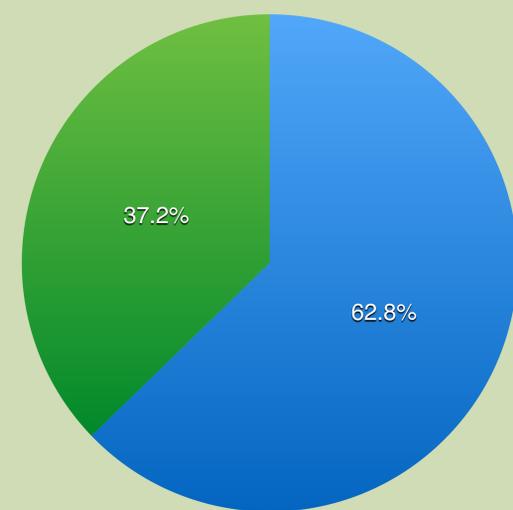
Results

Graph 1: All Symptoms Measured Before & After Study



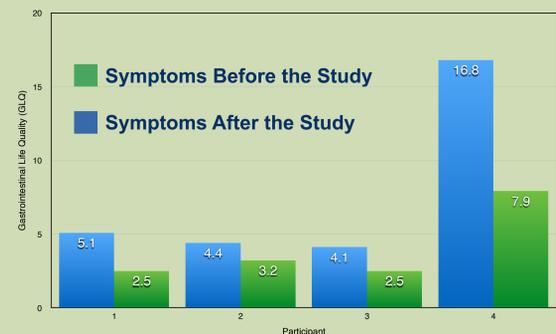
Improvement in overall symptoms were experienced by all participants as a result of the 21 day pilot study. On average, participants saw a 51% (± 9.9) reduction in symptoms. Symptoms included head-physical, head-mental, body, sleep, gastrointestinal, stool, and all those measured with the Lichtiger Index,

Chart 1: Gastrointestinal Symptoms Measured



The inadequacy of the Lichtiger Index (LI) to measure the gastrointestinal symptoms faced by those with bowel diversions, is evident in Chart 1, where 62.8% (± 7.5) of the reported symptoms were not measured by the LI.

Graph 2: Gastrointestinal Life Quality (GLQ)



Improvements in gastrointestinal symptoms were experienced by all participants as a result of the 21 day pilot study. On average, participants saw a 43% (± 11.9) reduction in symptoms. Symptoms included in the GLQ index include all of those measured with the Lichtiger Index, plus the non-duplicate symptoms in the "Gastrointestinal Symptoms" and "Stool Symptoms" measured in Table 4: Medical Symptoms Chart.

Conclusions and Future Work

Incorporating a bio-individual, non-inflammatory diet as part of the standard of care for post-colectomy patients can improve the patients' health and quality of life. The long-term affect of a non-inflammatory diet also may potentially reduce GI polyp burden through a mechanism similar to usage of NSAIDs. We are actively seeking a research partners to develop a formal study.

Additionally, a new tool, such as the GLQ index, should be utilized to effectively capture the pertinent symptoms experienced by those with bowel diversions.