

Nutrition in IBD

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Paul Cezanne Still Life with Apples Oil on canvas; The Museum of Modern Art, New York



Background

Nutrition and IBD

- CROHN'S DISEASE
10-12:100,000
- ULCERATIVE COLITIS
18-30:100,000
- 10% UNDER AGE 18

Nutrition and IBD

- Most people with IBD have lower BMI, fat mass, fat free mass & bone mineral content
- 85% of children with Crohn's have growth failure at diagnosis

Nutrition & IBD; Children

- Height velocity is most sensitive parameter
- Weight loss or failure to gain weight precedes impairment in linear growth

Nutrition & IBD

- Adequate nutrition is a factor of dietary intake, absorption & metabolic rate
- People with IBD may avoid eating because of abdominal pain, malabsorb due to inflammation with inflammation creating a higher metabolic rate

Willem Claesz Heda, Dutch, *Banquet Piece with Mince Pie*, 1635, oil on canvas, National Gallery of Art, Washington,



Nutrition & IBD

Energy Requirements and macronutrients

Nutrition & IBD

Energy Requirements

- Active disease has been estimated to decrease dietary intake by 20%
- Dietary restrictions are to be **AVOIDED** unless intestinal obstruction is present
- Increasing complaints of food intolerances by patient signals **UNCONTROLLED** disease

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Energy Requirements

- Resting energy expenditure (REE) increased in CD due to lower fat free mass
- When compared with a group of anorexic girls, those with CD had 35% higher REE -- presumed inflammatory effect
 - Azcue et al Gut, 1997

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Energy Requirements

- Children demonstrate catch up growth with increase in calorie intake to 60-75 cal/kg
 - Polk et al JPEN, 1992; Belli et al Gastro, 1988
- Changes in REE are reversible & sustainable with aggressive enteral nutrition

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Protein

- Whole body protein turnover is increased with disease activity
- Glutamine supplementation studies show inconsistent results
- No specific recommendations exist for quantitative or qualitative protein/AA supplementation

Pieter Claesz, Dutch, *Breakfast Piece with Stoneware Jug, Wine Glass, Herring, and Bread*, 1642, Museum of Fine Arts, Boston,



Nutrition & IBD Vitamins/Minerals

Nutrition & IBD

Vitamins/Minerals

- During disease exacerbation there have been reported deficiencies of nearly every vitamin & mineral
- Altered blood levels may not truly reflect body tissue stores
- Disease or removal of the last part of the small intestine may result in the need for B12 supplementation

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Vitamins/Minerals

- Deficiencies rarely cause symptoms except for iron & folate depletion
- Folate is protective against colon cancer
- Folate needs increase 6-8x normal in IBD
- Sulfasalazine & MTX interfere with folate metabolism

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Vitamins/Minerals

- Hyperhomocystinemia common in IBD & thought to occur due to decreased folate, B12 and B6
- Elevated homocystine levels are a risk factor for venous & arterial thrombosis
- Vitamin supplementation has not been shown to decrease thrombosis in IBD

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Vitamins/Minerals

- IBD patients have high rates of osteopenia & osteoporosis; (CD > UC)
- Newly diagnosed CD demonstrate hypercalciuria (*calcium loss in urine*)
- inflammation inhibits new bone development
- Corticosteroids @ >7.5mg/day, 5 g cumulative lifetime dose or > 12mons continuous use are risk factors for low bone mineral density

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Calcium/Vitamin D

- Children at greater risk for height deficits along with fractures
- Supplementation with Vit D & calcium **ALONG** with physical activity prescriptions provide best protection
- Bisphosphonate therapy inhibits bone reabsorption

Nutrition & IBD - micronutrients

- Suboptimal micronutrient levels are common in IBD
- Deficiencies in iron/folate and calcium/
Vit D result in overt symptoms
- Other nutrient deficiencies have sub-clinical impact resulting in defects in mechanisms of tissue repair

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Antioxidants

- Nutrient anti-oxidants protect cells from free radical injury
- Vitamins A, C, and E & selenium have been studied
- No definitive recommendations exist

Willem Kalf, Dutch, 1619–
1693, *Still Life*, c. 1660, National
Gallery of Art, Washington,



Nutrition as
Therapy for IBD

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Therapeutic Applications

- *Meta-analysis* have shown that enteral nutrition as primary therapy is inferior to corticosteroids to induce remission however in children improves growth
- Studies showing benefit generally use elemental formulas & are most effective for those with primarily small bowel disease

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Therapeutic Applications

- Many studies in this area are flawed by wide differences in formula types & high drop out rates
- Recent work is looking at fat content of enteral feeding
- Linoleic acid > than oleic acid
- No definitive recommendations exist

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Therapeutic Applications

- Enteral therapy is preferred due to cost & safety issues
- Parenteral therapy indicated pre & post op, severe malnutrition or those with perforation/fistualzing disease
- TPN as primary therapy for CD is as good as steroids with some studies showing benefit in UC

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Therapeutic Applications

- Increased omega-6 fatty acid, linoleic & arachidonic acid increase the inflammatory response
- Omega-3 fatty acid (fish oil) competes with omega-6
- Some studies show clinical benefit with decreased symptoms, steroid reduction & remission maintenance
- Larger studies needed

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Therapeutic Applications

- Colonic bacteria use up CHO/fiber & protein to short chain fatty acids (SCFA): acetate, butyrate & propionate
- SCFA concentrations decreased in UC
- Butyrate is the preferred 'food' for the intestinal lining of the colon
- Initial observations showed benefit however the findings are variable

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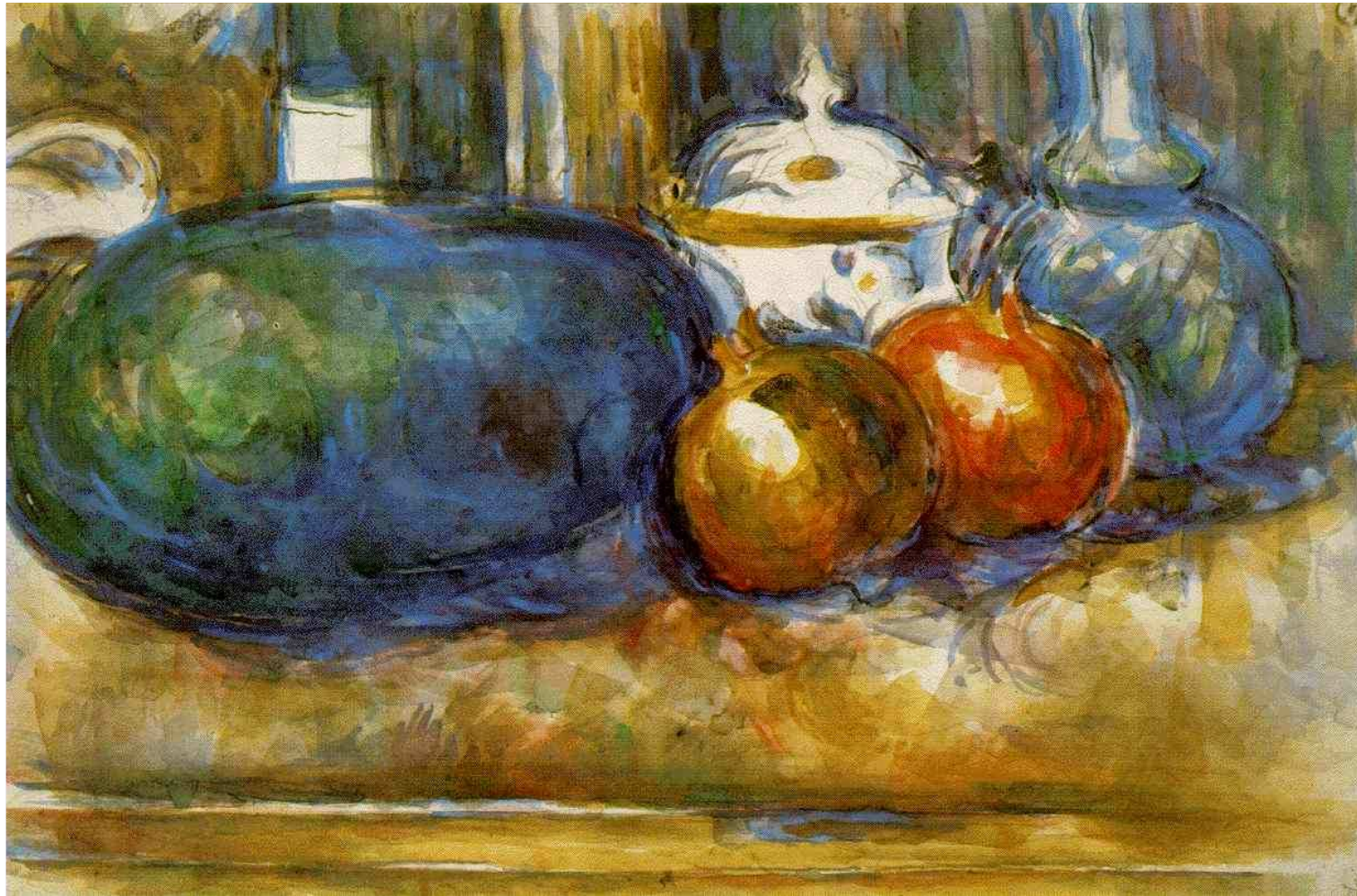
Therapeutic Applications

- New therapies have revolved around enteral formulas with added anti-inflammatory cytokines and dietary supplements composed of prebiotics & probiotics
- Insufficient studies exist to support the routine use of these nutrient components but more research is needed

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Summary

- Under-nutrition, nutrient losses, inflammatory factors & medications all contribute to the S/S of IBD
- Attention to the prevention of deficits as well as use of nutritional therapy deserve consideration in all patients with IBD



Cézanne, Paul
*Still Life with Watermelon
and Pomegranates*
Philadelphia Museum of
Art