Combined parenteral and enteral nutrition

Crohn’s disease

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EDUCATIONAL SESSION
COMBINED PARENTERAL AND ENTERAL NUTRITION

CASE BASED INTRODUCTION

Crohn’s disease
Flight schedule

- Introduction to the field
- Case report
- Guidelines
December 11th 1931:

“I have an important scientific contribution I would like to present before the American Gastroenterological Association. I have discovered, I believe, a new intestinal disease, which we have named Terminal Ileitis. I would like to present the facts before the Association in connection with the general subject of Benign Granulomata of the Intestinal Tract...”. Dr. Burril Crohn

Crohn BB, Ginzburg L, Oppenheimer GD. Regional ileitis: a pathologic and clinical entity. JAMA 1932; 99: 1323-1329
FIGURE 44-2. Sites of nutrient absorption. A. The entire small intestine absorbs carbohydrates, proteins, and lipids. However, the absorption is greatest in the duodenum, somewhat less in the jejunum, and much less in the ileum. The thickness of the arrows in the inset indicates the relative magnitude of total absorption at the indicated site in vivo. The maximal absorptive capacity of a specific segment under optimized experimental conditions (e.g., substrate concentrations) may be greater. B, Some substances are actively absorbed only in the duodenum. C, Bile acids are absorbed along the entire small intestine, but active absorption occurs only in the ileum. D, The vitamin cobalamin is absorbed only in the ileum.
Current “Step-Up” Approach to Crohn’s Disease (CD) Therapy

- Infliximab
- Adalimumab

- Surgery
- Nutrition?

Levels:
- Severe
- Moderate
- Mild

Treatment Options:
- Antibiotics
- Aminosalicylates
- Corticosteroids
- Prednisone
- Budesonide
- AZA/6-MP/MTX
Flight schedule

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Introduction

Spring 2006

18-years old girl, few months before the onset of symptoms

Height: 160 cm
Weight: 70 kg
BMI 27.5
History

- smoker
- during year 2006, she lost her appetite,
- developed diarrhea,
- abdominal pain
- weight loss
  - 30 kg weight loss/ 6 months
History

- **County Hospital** (60 km from University Hospital Center)

- Treated as **anorexia nervosa**, because of the appetite loss and decreased food intake as leading signs
- EN- “sip feeding” (200-300 ml/d)- irregular intake

- After therapeutic failure, transfer from a County Hospital to the University Hospital Center

- **38 kg weight loss**!
History

- At admission she was severely malnourished with a body mass index (BMI) of 12.6 kg/m².

- Investigation revealed a diagnosis of Crohn’s disease involving the ileum and colon, with a penetrating phenotype.

- **Nutritional team:**
  - EN via NGT (500ml/50/h) + PN
  - NGT was rejected after 24 h
  - PN + EN (300 ml per os)
Disease history and nutrition: PN+EN

- A **presacral abscess** was found at this initial presentation.
- **Surgery after a week:** drainage of the abscess, **ileocolonic resection** with an **ileotransverse anastomosis** and **stoma** in the sigmoid colon above the abscess site.

- **Therapy** at discharge:
  - Metronidazol + ciprofloxacin / 3 m
  - Azathioprine 75 mg
  - Mesalazine 3x 1000 mg
  - Folic acid 5 mg
  - **Enteral nutrition** (different polymeric formulae) - “sip feeding” up to 500 ml
After 1 y she represented with three active enterocutaneous fistulas on the anterior abdominal wall and a further abscess in the right iliac fossa.

Second laparotomy at which a resection of the transverse colon with excision of the enterocutaneous fistulas was performed.

**Therapy** at discharge:
- Metronidazol + ciprofloxacine/ 3 m
- Azathioprine 75 mg
- Mesalazine 2x 1000 mg
- Folic acid 5 mg
- **Enteral nutrition** (different polymeric formulae) - “sip feeding” up to 500 ml

**Weight:** 33 kg  
**BMI:** 12.89
In January 2009, she presented with fever, pain in the left lower quadrant, and again with three active enterocutaneous fistulas.

She weighed 34 kg at this time with a BMI of 13.3 kg/m².
Diagnostic workup revealed an abscess in the left iliac fossa and she underwent surgery for the third time.

A further segmental resection of the left colon with a terminal ileostomy was performed.
In the postoperative period in the surgical ICU the patient was started on PN at a rate that delivered **49 kcal/kg/d**!

- A standard AIO (Kabiven Central 1500 mL; Fresenius Kabi AB) was given together with 1750 mL of 5% glucose solution, thus comprising 1666 kcal/d,
  - 7.9 g N,
  - 233.7 g glucosae,
  - 58.5 g lipid,
  - 46.8 mmol Na,
  - 35.1 mmol K,
  - 2.9 mmol Ca,
  - 5.8 mmol Mg,
  - and 14.6 mmol phosphate.

- The patient also received a polymeric enteral formula (Modulen IBD, Nestle, 1 kcal/mL) 350-500 mL/d as an oral nutritional supplement and in preparation for weaning from PN.
Refeeding syndrome

- **After 5 days**
  - acute confusion, decreased conscious level
  - dizziness, dyplopia, nistagmus,
  - weakness,
  - palpitations, hypotension
  - nausea
Wernicke’s encephalopathy suspected

- **Laboratory Studies**
  - without significant electrolyte disbalance
  - CBC-normal
  - Slight metabolic acidosis
  - Glucose levels- normal
  - **Cerebral MR**- bilateral and symmetrical hyperintensities in the subthalamus, the floors of the third and fourth ventricles had shown

*Serum thiamine levels are not routinely measured in our hospital*
Empiric therapy applied - 100 mg of thiamine parenterally

Within a week neurologic symptoms vanished
Improved mental state
Nutritional support (PN+ EN):
- TPN- olive oil based formula (Oliclinomel N7, Baxter)
  - 30 kcal/kg/d
- Glucose 128 g/day
- MV added
- Polymeric enteral formula (Modulen, Nestle) - 250 ml/d
# Nutrition plan

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Name</strong></td>
<td>K.R.</td>
</tr>
<tr>
<td><strong>Body weight/Height/Age</strong></td>
<td>35 kg/1.60 m/22 y</td>
</tr>
<tr>
<td><strong>BMI /description</strong></td>
<td>13,7 / severe malnutrition</td>
</tr>
<tr>
<td><strong>Diet type</strong></td>
<td>Crohn’s disease</td>
</tr>
<tr>
<td><strong>Daily energy requirements</strong></td>
<td>~ 1703 kcal</td>
</tr>
<tr>
<td><strong>Average daily energy value of diet</strong></td>
<td>~ 2300 kcal</td>
</tr>
<tr>
<td><strong>Recommended weekly weight gain</strong></td>
<td>0,5 kg</td>
</tr>
<tr>
<td><strong>Recommended dietary supplement</strong></td>
<td>Modulen IBD x 500 mL (500 kcal) or Ensure plus 2x220 mL (660 kcal)</td>
</tr>
</tbody>
</table>
August 2009.

- Clinical remission of CD
- Weight: 48 kg
- BMI: 18.75
- Good mental and physical state
- Ordinary food and additional enteral nutrition (sip feeding)
- Therapy:
  - Azathioprine 100 mg
  - Mesalazine 3x 1000 mg
  - Folic acid 5 mg
  - **Enteral nutrition** (different polymeric formulae)- “sip feeding” up to 500 ml
Letter to the editor

Wernicke’s encephalopathy during parenteral nutrition in a Crohn’s disease patient
August 2009.- August 2011.

- In the care of GP
  - Azathioprine 100 mg
  - Mesalazine 2x 1000 mg
  - Folic acid 5 mg
  - **Enteral nutrition** (different polymeric formulae)- “sip feeding” up to 500 ml

- A very few control check-up’s at UH
- She have been in contact with UH via e-mails (irregularly):

  “...i feel fine, there is no need to travel for control visit”

- **Several times (2007-2011) she refused suggested screening for biological therapy** (”lymphoma fears”)

August 2011.

- ICU in County Hospital
  - Neurological symptomatology
  - Epi attacks
  - Septic (CRP 132 mg/L)
  - Na 104, K 3.2, Mg 0.80, phosphorus 0.60
  - Albumin 26 mg/L
  - Severly malnourished (weight 38 kg height 158 cm BMI 15.22)

  - **Nutrition**: volume replacement, electrolyte corrections and partial PN

- Transfer to University Hospital
August 2011.

Peristomal fistulae and abscesses

Hemato-liquidothorax (CVC !)

Pictures made and used with patients permission
• **AIO PN** - Oliclinomel N7 900 mL (Baxter S.A.) is used comprising 1080 kcal/d or 28 kcal/kg/d with an infusion rate of 50 mL/h.

• **Thiamine** 100 mg iv/ 5 days

• PN is supplemented with one vial of **vitamins** (Cernevit, Baxter) and 1 vial of **trace elements** (Decan, Baxter) to meet the basal requirements for micronutrients.

• The amount of **semielemental enteral formula** (Alitraq 1 kcal/mL, Abbott Nutrition) is 300 mL/d.
Flight schedule

- Introduction to the field
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- Guidelines
Guidelines


- Croatian guidelines for use of enteral nutrition in Crohn’s disease (2010.)

- The second European evidence-based consensus on the diagnosis and management of Crohn's disease: Current management (2010.)
Indications

- prevention and treatment of undernutrition,
- improvement of growth and development in children and adolescents,
- **peri-operative** nutrition,
- improvements in quality of life,
- acute phase therapy,
- maintenance of remission in chronic active disease.
Guidelines

• ESPEN Guidelines on Enteral Nutrition: Gastroenterology (2006.)

• Croatian guidelines for use of enteral nutrition in Crohn’s disease (2010.)

• The second European evidence-based consensus on the diagnosis and management of Crohn's disease: Current management (2010.)
Oral enteral nutritional support (500-1000 kcal daily) is recommended as supportive therapy in all malnourished patients and in all patients with increased risk of malnutrition.
Guidelines


- Croatian guidelines for use of enteral nutrition in Crohn’s disease (2010.)

- The second European evidence-based consensus on the diagnosis and management of Crohn's disease: Current management (2010.)
it is important not to underestimate the role of nutrition as supportive care in patients with Crohn's disease, even if there is limited evidence to support its use as a primary therapy to induce remission.

TPN in complex, fistululating disease.

Dignass A. et al. JCC 2010;4: 28-62
However, it is important not to underestimate the role of nutrition as supportive care in patients with Crohn's disease, even if there is limited evidence to support its use as a primary therapy to induce remission.

TPN in complex, fistulating disease.

Dignass A. et al. JCC 2010;4: 28-62
Specific indications in patients with CD include an obstructed gut, a short bowel, often with a high intestinal output or an enterocutaneous fistula.

Instead of conclusion

- Malnutrition is common in IBD patients
- Nutritional support, either enteral or parenteral or both of them simultaneously has been helpful
- Prefer enteral nutrition whenever is possible
- Use guidelines!