Case Report
Nutritional Management of Necrotizing Pancreatitis

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Necrotizing Pancreatitis

• Definition
  • Severe infection associated with acute pancreatitis with possible abscesses and psuedocysts

• Caused by:
  • Chronic alcoholism, trauma, biliary tract disease, certain drugs, some viral infections, hypertriglyceridemia, hypercalcemia, or combination

• Signs and Symptoms
  • Abdominal pain and distension, nausea, vomiting, steatorrhea
Case Presentation

- 28-year-old Female
- Diagnosis
  - Necrotizing acute pancreatitis and pseudocysts
- Reason for admit
  - ERCP/EUS and sphincterotomy
Client History

Past Medical History

- Past Medical History
  - Chronic acute pancreatitis
  - Pancreatic divisum
  - Status Post
    - pancreatic stent placement

Food/Nutrition-Related History

- Regular diet
Physical Findings

- Oral motor functions

- Food Intake
  - Poor oral food intake 2 days prior to admit
  - Nothing by mouth (NPO) for 3 consecutive days in hospital

- Gastrointestinal functions
  - Patient complained of nausea and abdominal pain
Anthropometric Measurements

- Last month 140 lbs
- Current weight 137 lbs
  - IBW 110 lbs (125%)
  - BMI 25.03 kilograms (kg) per meters squared
## Biochemical Measurements

<table>
<thead>
<tr>
<th></th>
<th>Assessment</th>
<th>Follow-up</th>
<th>Implication</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUN</td>
<td>2L</td>
<td>WNL</td>
<td>Possible malnutrition</td>
</tr>
<tr>
<td>Creatinine</td>
<td>0.5L</td>
<td>WNL</td>
<td></td>
</tr>
<tr>
<td>Glucose</td>
<td>57L</td>
<td>WNL</td>
<td>Pancreatitis</td>
</tr>
<tr>
<td>Total Protein</td>
<td>5.6L</td>
<td>5.7L</td>
<td>Infection, protein deficiency</td>
</tr>
<tr>
<td>Albumin</td>
<td>2.2L</td>
<td>2.1L</td>
<td>Moderate protein malnutrition, over-hydration</td>
</tr>
</tbody>
</table>

WNL: Within Normal Limits
Nutrition-Related Medications

- Antibiotic: Zosyn, Levaquin
- Vitamin: Folic Acid
- Mineral: Iron
- Analgesic (Opiod): Dilaudid
- Anti-Emetic: Zofran
Estimated Nutritional Needs

- Caloric
  - 1555 – 1870 kilocalories (kcal) (25-30 kcal/kg)
- Protein
  - 93 – 125 grams (g) (1.5-2 g/kg)
- Fluid
  - 1 ml/kcal or per MD
Medical Tests & Procedures

- Thoracentesis – removing 600 mL of fluid
- Dobhoff tube placement at level of ligament of Treitz
  - KUB pending
- Endoscopic retrograde cholangiopancreatography (ERCP) and stent placement pending
Diagnosis

- Inadequate energy intake related to GI dysfunction/pain as evidenced by NPO status times 3 days and poor oral intake prior to admit.
Evidence-Based Nutrition Recommendations

- A.S.P.E.N., 2009
  - Enteral Nutrition (EN) preferred
    - Fewer septic complications
    - Less costly
    - Time of resolution of disease is shortened compared to parenteral nutrition (PN)
A.S.P.E.N. Nutrition Recommendations

- Estimated Energy Requirements: 25 kcal/kg/day
- Estimated Protein Requirements: 1.5 g/kg/day
- Standard formula – 1kcal/mL
  - Ligament of Treitz
  - Intolerance
    - Fat-free elemental formula or semi-elemental formula
Support of A.S.P.E.N

• Aim (Xing-Mao et al. 2010)
  • Evaluate pancreatic infection in severe acute pancreatitis with Total Parenteral Nutrition (TPN) and Total Enteral Nutrition (TEN)

• Method
  • Cross-sectional study
  • Split into 2 groups
    • TEN group: Nasojejunal-gastric feeding, distal to ligament of Treitz
## Results

### TABLE 3. Characteristics of Surgical Intervention in the 2 Groups

<table>
<thead>
<tr>
<th>Variable</th>
<th>TPN</th>
<th>TEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surgical intervention, n (%)</td>
<td>43 (80)</td>
<td>12 (22)*</td>
</tr>
<tr>
<td>Days</td>
<td>16</td>
<td>27*</td>
</tr>
<tr>
<td>Reoperation</td>
<td>40 (74)</td>
<td>24 (42)*</td>
</tr>
<tr>
<td>Hemorrhage, mL</td>
<td>250</td>
<td>80*</td>
</tr>
<tr>
<td>Operation duration, h</td>
<td>2.5</td>
<td>2.5</td>
</tr>
</tbody>
</table>

*P < 0.05.

### TABLE 4. Necrosis, Morbidity, and Mortality in the 2 Groups

<table>
<thead>
<tr>
<th>Type of Necrosis</th>
<th>TPN</th>
<th>TEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Septic, n (%)</td>
<td>39 (72)</td>
<td>12 (23)*</td>
</tr>
<tr>
<td>Aseptic, n (%)</td>
<td>15 (28)</td>
<td>41 (77)*</td>
</tr>
<tr>
<td>Morbidity, n (%)</td>
<td>37 (68)</td>
<td>21 (40)*</td>
</tr>
<tr>
<td>Mortality, n (%)</td>
<td>23 (43)</td>
<td>6 (11)*</td>
</tr>
</tbody>
</table>

*P < 0.05.
Support of A.S.P.E.N.

• Aim (Viera el al. 2010)
  • Compare PN and EN to security, length of hospital stay, efficacy, morbidity, and mortality.

• Method
  • Cross-sectional study
  • Separated into two groups (PN & EN)
  • Feedings began 24-48 hours after admission
  • Both groups- 25-30 kcal/kg/day
# Results

**TABLE 5 - Distribution of patients with acute pancreatitis in groups A and B by presence of general complications or infections**

<table>
<thead>
<tr>
<th>Complications</th>
<th>A N (%)</th>
<th>B N (%)</th>
<th>Chi-squared</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>11(68.8)</td>
<td>6(40.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>5(31.2)</td>
<td>9(60.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>16(100.0)</td>
<td>15(100.0)</td>
<td>p=0.10</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Infections</th>
<th>A N (%)</th>
<th>B N (%)</th>
<th>Chi-squared</th>
<th>p</th>
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<tbody>
<tr>
<td>Yes</td>
<td>11(68.8)</td>
<td>3(20.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>5(31.2)</td>
<td>12(80.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>16(100)</td>
<td>15(100.0)</td>
<td>p=0.006</td>
<td></td>
</tr>
</tbody>
</table>
Interventions

- **Meals and snacks, fat-modified diet**
  - Recommend patient to advance to low-fat diet as medically able and as tolerated.

- **Enteral nutrition, composition/rate**
  - Osmolite 1.2
    - Start at 25 ml/hr increase to goal rate of 55 ml/hr
    - Provides 1584 kcal, 73g protein, and 1082 ml free water
Nutrition Classification

- **Moderate**
  - NPO for 3 days
  - Poor oral intake 2 days prior to admit
  - Pancreatitis
  - New tube feeding
Monitoring and Evaluation

• **Type of food/meals**
  • If diet is advanced to solid food, the patient is to consume 50%-75% of meals by follow-up.

• **Total energy intake**
  • Goal for patient is to meet at least 75% of nutritional needs by follow-up.
Follow-up

Physical Findings

- **Anthropometric Measurement**
  - New weight – 127 lbs
    - Weight loss
    - Fluid fluctuations

- **Oral and gastrointestinal function**
  - WNL
Estimated Nutritional Needs

- **Calories**
  - 1440-1730 kcal (25-30 kcal/kg)

- **Protein**
  - 87-115 g (1.5-2 g/kg)

- **Fluids**
  - 1 ml/kcal or per MD
Complications

- Enteral tube feedings until NJ tube migrated
  - NJ tube removed
  - NPO x2 days
  - Clear liquid diet
Follow-up

Medical Tests/Procedures

- ERCP & stent placement pending
- No plans for replacement of feeding tube
Interventions and Recommendations

- **Meals and snacks, fat-modified diet**
  - Recommend patient to advance to low-fat diet as medically able and as tolerated.

- **Enteral nutrition, composition/rate**
  - Osmolite 1.2
    - Start at 25 ml/hr increase to goal rate of 55 ml/hr
    - Provides 1584 kcal, 73g protein, and 1082 ml free water
Interventions and Recommendations

• **Parenteral Nutrition, composition/rate**
  - Recommend Clinimix E 5/15
  - Goal rate 83ml/hr
  - 1420 kcal, 100 g protein, Glucose Infusion Rate (GIR)
    - 3.7g/kg/min
    - 100% of caloric needs and protein needs
Follow-up

Monitoring & Evaluation

• None of the goals were met by follow-up

• Patient was discharged before next follow-up
  • Prior to discharge
    • Advanced to low-fat diet
    • ERCP and stent placed
Readmitted Nutritional Assessment

• Reason
  • 5 episodes- Diarrhea
  • Crampy abdominal pain
  • Vomiting

• Nutritional Assessment Required
  • TPN consult
Physical Findings

- Anthropometric Measurements
  - Weight: 132 lbs
- Gastrointestinal Function
  - Abdominal pain, slight distension, nausea
- Food Intake
  - Poor oral intake ~20 days
## Biochemical Measurements

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<td>Glucose</td>
<td>WNL</td>
<td>127H</td>
<td>Pancreatitis</td>
</tr>
<tr>
<td>AST</td>
<td>39 H</td>
<td>WNL</td>
<td></td>
</tr>
<tr>
<td>Albumin</td>
<td>2.2 L</td>
<td>WNL</td>
<td>Protein malnutrition, overhydration</td>
</tr>
<tr>
<td>Triglycerides</td>
<td>---</td>
<td>157H</td>
<td>Pancreatitis, high fat/sugar intake</td>
</tr>
<tr>
<td>Amylase</td>
<td>---</td>
<td>472H</td>
<td>Acute/chronic Pancreatitis</td>
</tr>
<tr>
<td>Lipase</td>
<td>---</td>
<td>94H</td>
<td>Acute/chronic Pancreatitis</td>
</tr>
</tbody>
</table>
Estimated Nutritional Needs

- No change from prior admit
Nutrition-Related Medications

- Analgesic (opioid): Dilaudid
- Anti-Emetic: Zofran
- Anti-Ulcer/Anti-GERD: Protonix
- Promotility: Reglan
- Hormone: Sandostatin
- Anticoagulant: Arixtra
Medical Tests/Procedures

- Planned PICC line placement
- Patient to remain on TPN for 2 weeks at home for complete pancreas rest
Diagnosis

- Inadequate energy intake related to compromised GI function and medical conditions as evidence by poor oral intake for approximately 20 days.
Intervention/Recommendation

• **Parenteral Nutrition, composition/rate**
  • Clinimix E 5/15
  • Goal rate: 83ml/hr
  • Additional 20% lipid infusion
  • 1563 kcal, 100 g protein, Glucose Infusion Rate (GIR) 3.7g/kg/min
    • 100% of caloric needs and protein needs
Monitoring & Evaluation

- **Total energy intake**
  - Goal for patient to meet at least 75% of nutritional needs by follow-up
Nutrition Status Classification

- **Moderate**
  - Poor oral intake ~20 days
  - Pancreatitis
  - New TPN
- Follow-up in 5 days
Physical Findings

- **Anthropometric measurements**
  - Weight: 121 lbs
    - 11 lb weight loss
    - Fluid fluctuations due to fluid retention

- **Nutritional Support**: TPN

- **Nutrient Needs**: Remained the same
Medical Conditions and Plan

- Multiple organizing fluid collections in abdomen area
- New ERCP & stent replacement pending
- TPN for 2 weeks at home for total pancreas rest

Baron and Morgan, 1997
Follow-up

Monitoring & Evaluation

- Monitoring and Evaluation
  - Total energy intake: The goal is for patient to meet 75% of nutritional needs by follow-up (met, ongoing).
Nutrition Status Classification

- **Moderate**
  - TPN
  - Pancreatitis
  - Weight loss
- Follow-up within 5 days
Status of Patient

- Patient was follow-up by RD
  - Continued to have more medical complications (i.e. infection, sepsis)
  - ERCP and stent placement
  - Discharged with TPN regimen
Conclusion

• Research recommendations for nutritional support
  • EN support – optimal
    • Less risk for infection, mortality, organ failure, and surgical intervention
    • Preserve gut function
  • TPN support
    • EN complications (i.e. migration of feeding tube)
Conclusion

• Followed recommendation guidelines
  • Medical complications noted

• Further studies
  • Pancreatic rest- still necessary?
    • Pancreatic rest with long-term nasojejunal tube feedings (Lordan et al., 2009)
    • New research: Feeding and Pancreatic Rest in Acute Pancreatitis
Questions?