Nutrition in Pediatric Acute Pancreatitis

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Objectives

• Summarize the current recommendations with regards to nutritional therapy in adult acute pancreatitis (AP)
• Review the existing literature in pediatrics
• Identify possible barriers in implementing the adult data into pediatric management
Background

- Incidence of pancreatitis in children is increasing\(^1\)
- Burden of recurrent and chronic forms of the disease are substantial\(^2,^3\)
- Nutrition is an important aspect in management of the disease
- Historically, nutritional therapy in AP has been nil per os (NPO) until clinical improvement followed by a gradual introduction of nutrition

1. Morinville et al. Pancreas 2010
2. Ting et al. JPGN 2016
Background

• Enteral nutrition is thought to maintain gut barrier function and prevent bacterial translocation

• Recent adult studies in severe AP:
  – Enteral nutrition has less infectious complications and mortality when compared to parenteral nutrition (PN)\(^1,2\)
  – Early enteral nutrition with improved outcomes - less incidence of severe disease and decreased LOS\(^3\)
  – No difference between nasogastric vs nasojejunal feeds\(^4\)

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Background

- Adult studies in mild AP
  - Various oral diets (clear, low fat, regular) tolerated similarly with no increased readmission rates\(^1\)
  - Immediate oral nutrition and patient directed nutrition with decreased LOS, no increase in adverse events compared to conventional mgmt\(^2,3\)
  - Meta-analysis of 5 RCTs, early oral nutrition associated with decrease LOS\(^4\)

3. Li et al. Pancreas 2013  
Adult Guidelines

• Several guidelines: AGA, IAP/APA, ACG, ESPEN, ICGC

• General recommendations include:
  – Mild AP
    • Gradual introduction of an oral diet, tube feeds if PO not tolerated after 5-7 days (all)
    • Immediate oral feeds if no nausea, vomiting or pain (ACG)
    • Low fat as safe as clear liquid as initial therapy (ACG)
  – Severe disease
    • Enteral nutrition over PN in predicted severe or severe AP (all)
    • Nasogastric and nasojejunal are equally safe (ACG, IAP/APA, ICGC, ESPEN)
Pediatric Data

- Lack of data overall
- No prospective or randomized studies
- Few retrospective studies in mild AP focusing on the type and timing of oral nutrition
Order set developed introducing early enteral (oral) nutrition and high intravenous fluids in mild AP

Retrospectively reviewed before and after implementation

201 patients divided into 4 groups combining:
- NPO vs PO (48 hours)
- Hi vs Low IVF (>1.5x maintenance)
Early Enteral Nutrition and LOS

- Early enteral nutrition (<48 hrs) associated with decreased LOS
  - 2.9 vs 4.4 days, p< 0.0001
  - Regardless of amount of fluid
Early Enteral Nutrition and Severe AP

- Early enteral nutrition also associated with decreased rate of severe AP
  - 6 vs 24%, p=0.0025
  - Difference was more pronounced with high IVF
• Evaluate NPO time and fat content on pain and LOS
• 38 patients evaluated retrospectively
• NPO vs early PO (within 24 hrs)
  – No difference in pain scores
  – LOS shorter but not statistically significant
Dietary Fat Content and Outcomes

- Fat intake had no effect on LOS
- Higher fat intakes was associated with decreased pain scores (p<0.001)
Dietary Fat Content and Outcomes

• Higher fat intake was not associated with higher lipase levels ($p=0.004$)

• Lipase levels also decreased with LOS, no significant difference after adjusting for this
Early Oral Nutrition in Mild AP

• Patient-directed nutrition (PDN) vs Treatment team-directed nutrition (TTDN)

• PDN group (n=30):
  – Enrolled within 24 hrs of diagnosis and followed prospectively
  – Allowed PO at enrollment

• TTDN group (n=92):
  – Retrospectively reviewed
  – Diet was advanced per physician discretion

Unpublished data
Nutritional Outcomes

• PDN group:
  – Dietary regression in 3 due to pain
  – All successfully advanced to low fat diet

• TTDN group:
  – Dietary regression in 16
    • Pain (10), elevated lipase (5), nausea/vomiting (5)
  – Tube feeds in 6
  – PN in 9 with 4 starting within 48 hrs of diagnosis

Unpublished data
Early Oral Nutrition and LOS

- Primary outcome was LOS
- PDN group: 48.5 hrs (IQR 30-70)
- TTDN group: 105 hrs (IQR 53-150)
- p<0.001

Unpublished data
Early Oral Nutrition and Outcomes

- **NPO time**
  - PDN group (14 hrs) vs TTDN group (34 hrs), \( p<0.0001 \)

- **Adverse events:**
  - No episodes of severe disease in PDN group
  - One readmission within 30 days, discharged within 24 hrs

Unpublished data
Summary of Pediatric Data

• Mild AP
  – Early oral nutrition may decrease LOS and appears well tolerated and safe
  – Dietary fat content does not appear to affect LOS or lipase values

• Severe disease
  – No data so no conclusions
Barriers to Implementation

• Etiologies of AP are different in children vs adults

• Pediatric patients have unique nutritional requirements
  – Metabolic demands vary with age
  – Lower fat mass and muscle mass, less reserve
  – May not tolerate fasting as well as adults

• Challenge of placement of enteral feeding tubes

• Identification of patients with severe or predicted severe disease
Management Conclusions

- **Mild AP**
  - Early oral nutrition if patient is clinically ready
  - Low fat diet is not required

- **Severe disease**
  - Enteral nutrition over PN, combination likely better than PN alone
  - Enteral nutrition within 48 hours if possible
  - Nasogastric or nasojejunal
Thank you!