Nutrition in acute pancreatitis (A.P)

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Aim & Objectives

Aim
• To update Dietitians on nutritional management of patients with acute pancreatitis

Objectives
• To provide an overview of acute pancreatitis
• To assist Dietitians in recognising how to assess & manage dietary aspects of pancreatitis
The Pancreas

**Exocrine**
- 95-98% of pancreas per weight
- Acinar, centroacinar, ductal cells
- 2.5L of exocrine fluid per day
- Nutrients in the intestines stimulate exocrine function
- Influenced by caloric content, nutrient composition, physical properties

**Endocrine**
- Cells arranged in diffusely distributed nests (islets)
- Only about 1% of weight, higher concentration in tail
- Insulin (anabolic hormone)
- Glucagon (induces hyperglycaemia)
Acute pancreatitis (AP)

An acute inflammatory process of the pancreas that frequently involves peri-pancreatic tissue and/or remote organ systems (Atlanta, 2012)

Requires 2 of 3 features
1. Abdo pain suggestive of AP
2. Serum lipase (or amylase) activity
3. Imaging consistent with AP
(revised Atlanta classification, 2016)

Severity in AP
Mild – No organ failure or local/systemic complications
Moderately severe – Transient organ failure or local systemic complications (resolves within 48hrs)
Severe – Persistent organ failure, for more than 48hrs
(revised Atlanta, 2016)

Predicting severity
• Imrie Glasgow score
• APACHE II
• CRP
• CT – severity index

Sub-types
Clinical Aspects

**Presentation**
- Abdominal pain - obvious and severe
- Radiates towards back
- Vomiting and diarrhoea
- Shock

**Aetiology**
- Alcohol & gallstones (80%)
- Metabolic (Trigs)
- Microlithiasis
- Hereditary causes
- Autoimmune pancreatitis
- Duct obstruction (e.g. tumour)
- Medications
- Anatomical anomalies
  (NICE, 2018)

**Incidence**
- Rising
- N.I – 530 cases/year
  (NCEPOD, 2016)
**Nutrition in AP**

**Mild AP**
- Low mortality, uncomplicated disease
- Patient usually restarts diet within days
- No benefit to feeding
  - RCT (NG vs NPO), less abdo pain, better food tolerance in NG group (Petrov 2013)
  - Already malnourished patient?

**Severe AP**
- High mortality
- Complications, SIRS, increased metabolic demands
- Higher TEE, catabolic, negative nitrogen balance
- Feeding considered essential
- Considerations
  - Under-nutrition
  - Alcoholism
  - Obesity

**Controversies in feeding**
- Timing?
- How to feed?
- Feed types? ESPEN, 2020
- Pancreatic exocrine insufficiency?
Clinical Nutrition

ESPEN Guideline
ESPEN guideline on clinical nutrition in acute and chronic pancreatitis

When to feed?

- Early oral Vs delayed oral?
- Early EN Vs on-demand EN?
- Early EN Vs delayed EN?
When to feed?

• Ensure no *nil by mouth* & do not have food withheld unless there is a clear reason (NICE, 2018)

• Offer EN to anyone with severe or moderately severe A.P. - Start within 72 hours of presentation & aim to meet nutritional requirements A.S.A.P (NICE, 2018, ESPEN 2020, Rec B 24-72 hours)

• Other considerations: lay members & Committee (NICE, 2018)
Which route: EN or PN?

**PN:** quick, easy to start, well-tolerated, expensive

**EN:** safe, cheaper, likely better health outcomes

**EN**
- Safest first line
- Lower mortality
- Reduced pancreatic & systemic infections
- Lower hospital LOS
- Less severe adverse incident
- Less Sx interventions required

**PN**
- Where EN not possible or tolerated, central route
- Do not give lipid-containing PN if Trigs >12 mmol/L (ESPEN, 2009)

**NICE 2018**
- EN should be offered to anyone with moderate / severe A.P.
- Offer PN only if EN has failed or is Contra-indicated

**ESPEN 2020**
- With AP pts & inability to feed orally EN shall be preferred to PN (Rec A)
- PN should be administered when EN not tolerated / unable to tolerate targeted nutritional requirements (GPP)
Immuno-nutrition

Glutamine

- Should be infused where patients receiving PN. If PN indicated, consider parenteral glutamine
- No recommendations for enteral glutamine

Meta-analysis of RCTs (12); n=505
Which EN route – NG / NJ?

**EN route**
- Majority of studies low or very low quality, imprecision & bias
- Jejunal feeding shown to be safe & NOT less effective than PN
- NO evidence to support belief that NG feeding is inappropriate
- Evidence debates benefits & harms, outcomes, quality of the evidence

**NICE 2018**
- Not specified
- Clinical judgement & case-by-case basis

**ESPEN 2020** (Rec B)
- NG first
- NJ in case of digestive intolerance
**Type of EN**

- **Standard polymeric feed** *(ESPEN 2020, Rec A)*
- **Peptide feeds may ↓ but may not remove the need for PERT*
- **Both polymeric & semi-elemental formulas feasible, safe & well tolerated:** small RCT, Tiengou et al. 2006 Vs meta-analysis studies that show no difference between formulas but in severe AP with malabsorption, semi-elemental may be of interest.
- **Lower feed rates over long periods may decrease the risk of overwhelming digestive capacity**
<table>
<thead>
<tr>
<th>Protein source</th>
<th>Fat Source</th>
<th>Osmolality Mosm/kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peptide</td>
<td>% MCT</td>
<td>Mosm/kg</td>
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</table>

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<th>Fat Source</th>
<th>Osmolality Mosm/kg</th>
<th>Mosm/kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peptamen (Nestle, UK)</td>
<td>Peptide</td>
<td>70.3%</td>
<td>265</td>
</tr>
<tr>
<td>Peptamen HN (Nestle, UK)</td>
<td>Peptide</td>
<td>69.4%</td>
<td>430</td>
</tr>
<tr>
<td>Vital 1.5 (Abbott, UK)</td>
<td>Peptide</td>
<td>63.6%</td>
<td>630</td>
</tr>
<tr>
<td>Perative (Abbott, UK)</td>
<td>Peptide</td>
<td>37%</td>
<td>385</td>
</tr>
<tr>
<td>Survimed OPD (Fresenius, UK)</td>
<td>Peptide</td>
<td>51.4%</td>
<td>350</td>
</tr>
<tr>
<td>Survimed OPD HN (Fresenius, UK)</td>
<td>Peptide</td>
<td>51.9%</td>
<td>460</td>
</tr>
<tr>
<td>Nutrison Peptisorb (Nutricia, UK)</td>
<td>Peptide</td>
<td>47%</td>
<td>535</td>
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<tr>
<td>Nutrison MCT (Nutricia, UK)</td>
<td>Peptide</td>
<td>60.6%</td>
<td>315</td>
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<tr>
<td>Emsogen (Nutricia, UK)</td>
<td>Amino acid</td>
<td>83%</td>
<td>Depends on dilution used</td>
</tr>
<tr>
<td>Elemental 028 Extra Liquid (Nutricia, UK)</td>
<td>Amino acid</td>
<td>35%</td>
<td>725</td>
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Pancreatic Exocrine Insufficiency (PEI)

Deficiency in, or absence of, the 3 major groups of pancreatic enzymes: amylase, protease and lipase

- Prevent normal breakdown and digestion of food leading to nutrient malabsorption
- Lipase particularly vulnerable, so fat malabsorption occurs first and may be most evident
- Steatorrhoea becomes apparent when >90% function lost

# Signs and symptoms of PEI

<table>
<thead>
<tr>
<th>Early symptoms</th>
<th>Late symptoms</th>
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<tbody>
<tr>
<td>Steatorrhoea (pale, floating, oily stool)</td>
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<tr>
<td>Loose, watery stool</td>
<td></td>
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<tr>
<td>Undigested food in stools</td>
<td></td>
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<tr>
<td>Post-prandial abdominal pain</td>
<td></td>
</tr>
<tr>
<td>Nausea / colicky abdominal pain</td>
<td></td>
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<tr>
<td>Gastro-oesophageal reflux</td>
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<tr>
<td>Bloating / food intolerance</td>
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<tr>
<td>Malnutrition</td>
<td></td>
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<tr>
<td>Weight loss</td>
<td></td>
</tr>
<tr>
<td>Vitamin deficiencies (especially A, D, E, K)</td>
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<tr>
<td>Hypoglycaemia in diabetes</td>
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Use of PERT in A.P

• Should not be supplemented generally
• EXCEPT if obvious PEI (ESPEN, 2020)

• In BHSCT if pt unable to take PERT orally & has enteral feeding tube – tend to recommend Pancrex V powder 1-2g, 2hourly with feed (Pancrex V capsules are another option)
• If in doubt / need advice contact specialist RD
Other issues

Re-introducing diet

Following mild AP
• Once pain controlled, as soon as clinically tolerated, allow to start eating (ESPEN Rec A)
• Low fat, soft diet (ESPEN Rec A)
• Revert to oral fluids if pain worsens on eating

Following severe AP
• Insufficient evidence re: optimal timing / type of diet
• Start with small amounts CHO/protein-rich foods.
• Careful reintroduction of fat x3-6 days.
• Restart ‘normal’ diet.
• PERT may be required for some.
• Counsel re: alcohol avoidance.
Other Issues

Probiotics
Considered unsafe and are *not* recommended in severe AP due to risk of gut ischaemia and higher mortality (ESPEN, 2020)
Post D/C

• 20-50% develop new onset DM
• >40% ongoing abdominal symptoms
• 3-13% incidence of chronic pancreatitis
• “post traumatic stress” effects of prolonged ITU stay

Hasibeder et al. 2009
NCEPOD “Treat the cause” A.P Report 2016

- 215 NHS hospitals England, Scotland & NI
- 712 questionnaires & casenotes over 6months, 2014
- Overall Mx of nutrition considered adequate in only 85% of cases & by 77% of clinicians
- NST in place: 87.5%
- Nutritional screening: 67.4%
- Referrals to dietitian & NST: 39%
- Supplemental nutrition considered: 43.2% (further 9% should have)

18 recommendations (1 nutrition related)
- ALL pts admitted with A.P should be assessed for risk of malnutrition (MUST) & provides basis for referral to dietitian or a NST & subsequent timely & adequate nutrition support (also supported by ESEPN, 2020, Rec B)

- Regional T&F Group, PHA
- Issues raised re: accuracy of MUST audits being reported
- Paper submitted re: lack of NST in regional HPB service
Case-study

• 53yr old, male, T/F from other hospital

*Diagnosis:* necrotising acute pancreatitis, developed pancreatic pseudo-cyst, for drainage in MIH.

*PMHx:* autism, DM secondary to pancreatitis

*SHx:* lives with Mum, non-smoker, no alcohol

*DHx:* risperidone

*Usual wt:* 90kg, BMI 29.4kg/m²
Prior to transfer:
- 3 month admission, had been NG fed for a period until dietary intake & ONS (Procal shot) established.
- CREON started (75,000iu with meals & 25,000iu with snacks).
- 12.7kg wt loss in ~2.5months (14.1% wt loss). BMI 25kg/m2

On transfer:
- c/o insulin by DSN.
- Poor oral intake due to intermittent N&V post drainage & developed HAP.
- Need for EN raised & risk of re-feeding highlighted however T/F back to referring hospital & care transferred to local RD.
Case-study 1

Decreased oral intake → NG + ONS + PERT + Insulin → Peripheral PN → TPN

JEJ → TPN → Diet + ONS → TPN → Oral; fat free diet + ONS

‘normal’ diet (DM) → NG (fat free) + Low fat diet → DM diet + ONS → Excellent intake HP/E/DM diet and ONS
Take home messages

- Complex, many prolonged stays
- Roller-coaster / close monitoring with changing nutritional needs
- Aggressive nutritional support needed
- Polymeric / Semi-elemental feed
- Monitor need for PERT
- High risk of DM
- Contact specialist RD for advice if needed
Thank-you for listening!