Pancreatic Exocrine Insufficiency

Liz Bradley
Specialist Dietitian
Pancreatic Exocrine Insufficiency
What is Pancreatic Exocrine Insufficiency (PEI)?

Occurs when the pancreas is unable to produce sufficient enzymes or produce them at the right time to ensure adequate digestion
The Pancreas

- Digestive enzymes
- Bicarbonate solution
- Hormones for glycaemic control

PCUK
Who gets PEI?

• Lack of Healthy Pancreatic Tissue (Primary Insufficiency)
  – Pancreatic cancer
  – Pancreatic surgery
  – Pancreatitis
  – Cystic fibrosis

• Lack of Pancreatic Stimulation (Secondary Insufficiency)
  – Gastric resection
  – Duodenal resection
  – Medications that ‘dry up’ pancreatic secretions e.g. octreotide

• Increasing evidence for PEI in other conditions e.g. coeliac disease, diabetes, IBS and IBD...
Who gets PEI?

The incidence of PEI varies significantly:

- 30-90% of people with pancreatic cancer
  - Sikkens et al. 2014

- 60-100% of people following pancreatic head (PD) resection

- 0-50% of people following distal pancreatectomy
Identifying PEI

Faecal Elastase
- <100ug/g severe PEI
- 100-200ug/g moderate PEI
- 200 – 500ug/g (low sensitivity/specificity)
- >500ug/g

Consider: the clinical picture, surgical history, treatments, CT reports and symptoms.

Identifying PEI

Symptoms:
- Oily, fatty or bulky stools
- Pale, orange or yellow stools
- Stools that float / are difficult to flush
- Offensive smelling stools
- Wind, bloating, abdo pain or cramps
- Weight loss out of balance with intake
- Micronutrient deficiencies
- Hypoglycaemia in patients with diabetes

Beware:
- Low fat diets
- Constipation – opiates
Why do we treat PEI?

To prevent and/or reverse

- **Malnutrition**
- Weight loss/ difficulty gaining weight
- Reduced strength/ poor function
- Vitamin & mineral deficiencies and associated complications e.g. osteoporosis, night blindness
- GI symptoms
- Reduced QoL
Malnutrition

‘Lack of proper nutrition, caused by not having enough to eat, not eating enough of the right things, or being unable to use the food that one does eat’

Oxford English Dictionary
Good nutritional input can improve quality of life for people with pancreatic cancer and, potentially improve their ability to undergo oncological treatment and survival.
Cachexia Worsens Prognosis in Patients with Resectable Pancreatic Cancer

Jeannine Bachmann · Mathias Heiligensetzer · Holger Krakowski-Roosen · Markus W. Büchler · Helmut Friess · Marc E. Martignoni

Cachexia has a significant impact on survival (654 vs. 451 days)
Weight stabilisation is associated with improved survival duration and quality of life in unresectable pancreatic cancer

Wendy Davidson, Susan Ash, Sandra Capra, Judith Bauer, on behalf of the Cancer Cachexia Study Group

Weight stabilisation is associated with better survival in unresectable pancreatic cancer
259 days vs. 164
How do we treat PEI?

Pancreatic enzyme replacement therapy (PERT):

- **Pancreatin** - enteric-coated minimicrospheres / microtablets
  - Containing:
    - Lipase – digests fat
    - Protease – digests protein
    - Amylase – digests carbohydrate
  - Creon Micro, Creon 10,000, **Creon 25,000**
  - **Pancrex V powder**, Pancrex granules, Pancrex V Capsules, Pancrex V tablets
  - Nutrizym 22 capsules
  - Pancrease HL capsules

All are of porcine origin
How much PERT?

Everybody is different....

<table>
<thead>
<tr>
<th>Enzyme</th>
<th>Mean intra-digestive</th>
<th>Post prandial peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amylase</td>
<td>50 – 250u/min</td>
<td>500 – 1000u/min</td>
</tr>
<tr>
<td>Lipase</td>
<td>up to 1000u/min</td>
<td>3000 – 6000u/min</td>
</tr>
<tr>
<td>Proteases (Trypsin)</td>
<td>50 – 100u/min</td>
<td>200 – 1000u/min</td>
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</tbody>
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Enzymes release continues for approximately 2 hours post prandially (360,000-720,000u lipase)

Keller and Layer 2005
How to take PERT effectively

• Starting with 50-72,000 units lipase with each meal, 20-50,000 units with snacks and milky drinks

• Build up dose depending on symptoms
• Wait 3-4 days before increasing dose
• Give education on foods that need more / less
• Provide supporting written information
• If cannot swallow whole open capsule, mix contents with a teaspoon of something soft, cold and acidic
Larger portions and/or fattier foods require more enzymes.

Most patients can self adjust their doses appropriately with some education.
“What is the maximum I can have in a day?”

- There is no maximum dose
- If you do take more than your body really needs, you can get irritation of the anus
Things to avoid...
Things to check...
Things that help

• Patients and staff knowing what PERT is for, how and when to take it
• Written information
• Self medicating by most patients
Troubleshooting

- Adequacy of dose
- PPI
- Timing
- Storage
- Differential diagnoses: coeliac disease, bile acid malabsorption, bacterial over-growth, lactase deficiency, a food intolerance, infective diarrhoea......
- Consider changing the brand of PERT
Summary

• PEI is very common in pancreatic cancer and surgery and should always be considered with these diagnoses
• Min starting dose 50,000 units lipase/ meal
• With (almost) everything eaten & milky drinks - no daily dose
• No foods are banned
• Porcine - informed consent
• Self medication in hospital encouraged
• Monitoring is important
Sli.do: #StudyDay19
References

- NICE guidelines for pancreatic cancer 2018
- Phillips M. E. 2015 Pancreatic exocrine insufficiency following pancreatic resection. Pancreatology, 15, 449e455