EARLY CHRONIC PANCREATITIS – ARE YOU MISSING IT?

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FINANCIAL DISCLOSURES

- MEDICAL ADVISORY BOARD MEMBER COOK MEDICAL
- AUSTRALASIAN PANCREATIC CLUB RECEIVES FINANCIAL SUPPORT FROM MYLAN

ROAD MAP…

- DEFINITION AND SPECTRUM OF CHRONIC PANCREATITIS
- SIGNS AND SYMPTOMS
- WHO IS AT RISK?
- HOW CAN WE IDENTIFY PATIENTS WITH ECP?
- CONSEQUENCES
  - PANCREATIC EXOCRINE INSUFFICIENCY
  - PANCREATIC MALIGNANCY
- OPTIMAL MANAGEMENT: LIFESTYLE CHANGES AND PHARMACOLOGICAL THERAPIES
- FUTURE DIRECTIONS – DIAGNOSTIC TOOL FOR GENERAL PRACTICE (APC STUDY)

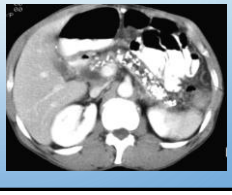
DEFINITION: CHRONIC PANCREATITIS

Chronic pancreatitis is a pathologic fibro-inflammatory syndrome of the pancreas in individuals with genetic, environmental and/or other risk factors who develop *persistent pathologic responses to parenchymal injury or stress*

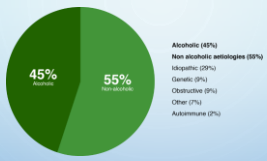
- PANCREATIC ATROPHY
- FIBROSIS
- DUCT DISTORTION AND STRICTURES
- CALCIFICATIONS
- PANCREATIC EXOCRINE DYSFUNCTION
- PANCREATIC ENDOCRINE DYSFUNCTION
- DYSPLASIA

TRADITIONAL TEACHING

- RARE - 0.5% OF POPULATION
- ALCOHOLIC OR 'CLOSET ALCOHOLIC'
- PAINFUL, STEATORRHOEA, WEIGHT LOSS
- DIAGNOSIS WITH CT, 72 HOUR FAECAL FATS



AETIOLOGY OF CHRONIC PANCREATITIS



NAPS2: A HIGHER THAN EXPECTED NUMBER OF CP PATIENTS (55%) WERE CLASSIFIED WITH NON-ALCOHOLIC AETIOLOGY

North American Pancreatitis Study 2 (NAPS2)

HOW COMMON IS CHRONIC PANCREATITIS?

There is evidence to suggest that pancreatic disease may exist undiagnosed in medical practice[1-4]

AUTOPSY STUDY

- **1978[1] (DENMARK)**

- 394 AUTOPSIES WERE CONDUCTED, WHEREBY THE PANCREAS OF EACH CADAVER UNDERWENT HISTOLOGICAL EXAMINATION
- POST MORTEM RESULTS SHOWED THAT 52 OF THE 394 (13%) EXAMINED BODIES SHOWED EVIDENCE OF CHRONIC PANCREATIC INFLAMMATION
- OF THE BODIES SHOWING EVIDENCE OF CHRONIC PANCREATIC INFLAMMATION, ONLY 2 HAD BEEN DIAGNOSED WITH CHRONIC PANCREATITIS

SCREENING ASYMPTOMATIC PATIENTS 1

- **1991[2] (FRANCE)**

- 180 PATIENTS THOUGHT TO BE FREE OR ANY ABDOMINAL OR PANCREATIC DISEASE AGED FROM 16-83 YEARS OLD HAD THEIR DUODENAL JUICE COLLECTED
- OF THE STUDY GROUP ANALYSED, THE OLDER PATIENTS WERE FOUND TO HAVE A LOWER FUNCTIONING PANCREAS (SUGGESTING PANCREATIC FUNCTION DECREASES WITH AGE) AND 6% OF PATIENTS WERE FOUND TO HAVE PANCREATIC EXOCRINE INSUFFICIENCY (PEI)

SCREENING ASYMPTOMATIC PATIENTS 2

- **2005[3] (GERMANY)**

- A TRIAL TOOK STOOL SAMPLES FROM 914 PARTICIPANTS AGED BETWEEN 50-75 YEARS OLD
- THE LEVELS OF ELASTASE-1 (AN ENZYME SECRETED BY THE PANCREAS) WERE MEASURED TO DETECT PANCREATIC FUNCTION
- RESULTS SHOWED THAT 105 (12%) OF PARTICIPANTS DISPLAYED SIGNS OF PANCREATIC EXOCRINE INSUFFICIENCY (PEI) AND 47 (5%) DISPLAYED SIGNS OF SEVERE PEI
- THE FINDINGS FROM THIS STUDY SUGGEST THAT THE PREVALENCE OF PEI INCREASES WITH AGE

SCREENING IBS SYMPTOMS

- **2014[4] (USA)**

- MEDICAL RECORDS OF 2256 PATIENTS WITH IRRITABLE BOWEL SYNDROME (IBS) WERE ANALYSED FOR ABNORMAL FAECAL BIOMARKERS
- APPROXIMATELY 7% OF PATIENTS ASSESSED WERE FOUND TO HAVE LOW FAECAL ELASTASE LEVELS WHICH INDICATES PANCREATIC EXOCRINE INSUFFICIENCY (PEI)
- THE FINDINGS OF THIS STUDY SUGGEST THAT SOME PATIENTS DIAGNOSED WITH IBS MAY HAVE A MORE SINISTER, UNDERLYING CONDITION

SCREENING SYMPTOMATIC PATIENTS

- 'FUNCTIONAL DYSPEPSIA'
  - 22% OF SMOKERS WITH EPIGASTRIC PAIN NOT RESPONSIVE TO PROTON PUMP INHIBITORS
  - CHRONIC PANCREATITIS CHANGES ON EUS
- 'TYPE1,2 DIABETICS'
  - CLINICAL RECORDS OF 1,922 PATIENTS WERE RETROSPECTIVELY EXAMINED FOR FEATURES OF T1/T2 DM, OR PEI/CP ON IMAGING
  - 157 (8%) WERE RECLASSIFIED AS TYPE 3C DIABETES

Dominguez Muñoz, Personal data, Hardt Diabetes Care 2008

EVIDENCE FOR UNDIAGNOSED PANCREATIC EXOCRINE INSUFFICIENCY IN THE GENERAL POPULATION

Study author	Patient characteristics	Country	Patient numbers	Method of investigation	Result
Olsen T. 1978[1]	Post mortem	Denmark	394 autopsies	Histology	**13% pancreatic inflammation**
Laugier R, *et al*. 1991[2]	Healthy persons aged 18 to 83 years	France	180 prospective	Direct secretin, CCK test	**6% PEI**
Rothenbacher D, *et al*. 2005[3]	General population aged 50-75 years	Germany	914 prospective	Fe-1<200mcg/g	**11.5% PEI**
Herzig K, *et al*. 2011[4]	Persons aged 60-92 years	Germany	106 prospective	Fe-1< 200mcg/g	**21.7% PEI**
Leeds J, *et al*. 2010[5]	IBS-D	United Kingdom	314 prospective	Fe-1<100mcg/g ↓ CT scan	**6.1% severe PEI ↓ 21% CP**
Goepp J, *et al*. 2014[6]	IBS related symptoms	USA	2256 retrospective	Fe-1 <200mcg/g	**7.1% PEI**
Campbell J, *et al*. 2014[7]	Diarrhoea, abdominal pain, weight loss	United Kingdom	1887 retrospective	Fe-1<200mcg/g ↓ CT, MRI, US scan	**11.4% PEI ↓ 33.1% CP or PC**

1. Olsen T. Acta Path Microbiol Scand. 1978; Sect. A, 86:361-365. 2. Laugier R. et al. Digestion 1991; 50:202-2113.3. Rothenbacher D. et al. Scandanavian J Gastroenterol. 2005; 40:697-704. 4. Herzig K. et al. BMC Geriatrics 2011;11:4. 5. Leeds J. et al. Clinical Gastroenterology and Hepatology 2010; 8:433-438. 6. Goepp J. et al. Global Adv Health Med. 2014; 3(3):9-15. 7. Campbell J. et al. Gut 2014; 63: A253.

DOES IT MATTER?

THE CONSEQUENCES OF UNDIAGNOSED PANCREATIC DISEASE

1.Fitzsimmons D. *et al. Am J Gastroenterology* 2005; 100:918-926. 2. Czako L. *et al. Can J Gastroenterology* 2003; 17(10):597-603. 3. D'Haese J. *et al. Pancreas* 2014; 43(6):834-841. 4. Dumasy V. *et al. Am J Gastroenterology* 2004; 99 (7):1350-1354. 5. Trolli P. *et al. Gastroenterology Nursing* 2001; 24(2):84-87. 6. Lindkvist B. *et al. Pancreatology* 2012; 12:305-310. 7. Duggan S. *et al. Clinical Gastroenterology and Hepatology* 2014; 12:219–228. 8. Lowenfels A. *et al. NEJM* 1993; 328(20):1433-1437. 9. Ewald N & Hardt P. *World J Gastroenterology* 2013; 19(42):7276-7281. 10. Seicean A. *et al. J Gastrointest Liver Dis* 2006; 15;1:21-26. 11. Pinho A. *et al. Cancer Letters* 2014; 345:203-209.

WHY MISSED:

- CLINICAL SYMPTOMS AT EARLY STAGE ARE NON-SPECIFIC
- MAINSTAY OF INVESTIGATIONS POORLY SENSITIVE IN EARLY DISEASE

Need a high index of suspicion

HISTORY

- ALCOHOL
- SMOKING
- GENETICS
  - CF
  - HEREDITARY PANCREATITIS
    - PRSS1
    - SPINK1
    - CTRC
- DUCTAL OBSTRUCTION
- SYSTEMIC DISEASES
  - SLE
  - HYPERTRIGLYCERIDAEMIA
  - HYPERCALCAEMIA
  - COELIAC
- AUTOIMMUNE
- TROPICAL

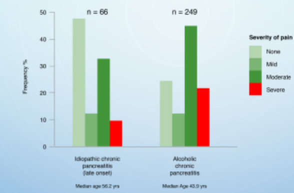
SIGNS AND SYMPTOMS IN CHRONIC PANCREATITIS

- ABDOMINAL PAIN
- PANCREATIC INSUFFICIENCY
  - MALABSORPTION
    - WEIGHT LOSS
    - DIARRHOEA
    - NUTRIENT DEFICIENCIES – PARTICULARLY FAT-SOLUBLE VITAMINS (ADEK)
  - TYPE IIIC DIABETES

PAIN

- USUALLY UNRELATED TO MEALS
- EARLY – PAIN IN DISCRETE ATTACKS; CAN BE MISTAKEN FOR ACUTE PANCREATITIS, NUD
- LATE – CONTINUOUS, CLASSIC
- DOES NOT IMPROVE OVER TIME
    - AMMANN, GASTROENTEROLOGY. 1999, MULLADY GUT 2011

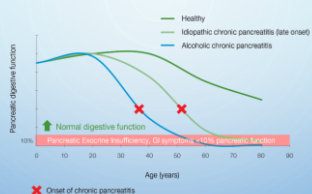
WHY DOES CHRONIC PANCREATITIS EXIST UNDETECTED?



- 90% OF PATIENTS WITH IDIOPATHIC CHRONIC PANCREATITIS PRESENTS WITH MILD, MODERATE OR **NO PAIN SYMPTOMS**

Layer P. *et al. Gastroenterology* 1994; 107:1481-1487.

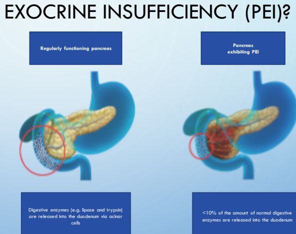
PEI AND CHRONIC PANCREATITIS



Adapted from: Laugier R. et al. Digestion 1991; 50:202-221, Rothenbacher D. et al. Scandanavian J Gastroenterol. 2005; 40:697-704, Vellas B. et al. International J Pancreatology. 1988; 3:497-502

WHAT IS PANCREATIC EXOCRINE INSUFFICIENCY (PEI)?

- PROGRESSIVE LOSS OF ACINAR CELLS
- INSUFFICIENT SECRETION OF DIGESTIVE ENZYMES INTO THE DUODENUM[1]
    - FUNCTIONALITY OF THE PANCREAS DROPS BELOW 10%[1-3]
- FOOD IS NOT DIGESTED PROPERLY AND THE NUTRIENTS THAT THE BODY REQUIRES ARE NOT ABSORBED – THIS CAN LEAD TO MALNUTRITION AND OTHER COMPLICATIONS (SUCH AS OSTEOPOROSIS)[4]



CLINICAL CONSEQUENCES OF PEI

SYMPTOMS OF PEI

- **A COMBINATION OF ANY OF THE FOLLOWING SYMPTOMS IS AN INDICATION THAT A PATIENT COULD HAVE PEI[1-4]**
    - **GAS AND BLOATING**
        - *FOOD NOT BEING DIGESTED PROPERLY CAN LEAD TO BLOATING IN THE ABDOMEN*
    - **ABDOMINAL PAIN**
        - *GAS PRODUCED BY FOOD NOT BEING DIGESTED FULLY CAN LEAD TO ABDOMINAL PAIN*
    - **FREQUENT DIARRHOEA**
        - *CAUSED BY UNDIGESTED FOOD MOVING TOO QUICKLY THROUGH THE DIGESTIVE TRACT*
    - **WEIGHT LOSS**
        - *DUE TO THE IMPAIRED DIGESTION AND ABSORPTION OF FATS, PROTEINS AND CARBOHYDRATES, WEIGHT LOSS OFTEN OCCURS IN INDIVIDUALS WITH PEI*
    - **STEATORRHOEA**
        - *OILY, FLOATING AND VERY FOUL SMELLING STOOLS THAT ARE DIFFICULT TO FLUSH – THIS IS DUE TO EXCESS FAT BEING EXCRETED IN THE FAECES DUE TO POOR FAT DIGESTION AND ABSORPTION*
    - **MUSCLE WEAKNESS**
        - *THE LACK OF PROTEIN BEING PROPERLY DIGESTED AND ABSORBED MEANS THAT THE AN INDIVIDUAL WITH PEI CAN HAVE WEAK MUSCLES*

INVESTIGATIONS

RECOMMENDATIONS TO INVESTIGATE FOR PANCREATIC DISEASE AND PEI IN PATIENTS PRESENTING WITH CHRONIC DIARRHOEA SYMPTOMS

Britain	USA	Australasia
2003	2012	2015
British Society of Gastroenterology[1] Guidelines for Investigation of chronic diarrhoea, 2nd Edition	**Mayo Clinic, Rochester, USA[3]** Evaluating the Patient With Diarrhea: A Case-Based Approach	**Australasian Pancreatic Club[2]** Australasian treatment guidelines for the management of pancreatic exocrine insufficiency
*"Diarrhoea may result from: (a)colonic neoplasia/ inflammation; (b)small bowel inflammation (c)small bowel malabsorption; **(d)maldigestion due to pancreatic insufficiency; or** (e)motility disorders, and it can be difficult to separate these on clinical grounds."*	*"When fatty diarrhea is identified, the initial goal is to distinguish malabsorption from maldigestion. The evaluation focuses on looking for a structural problem involving the small intestine or **pancreas**."*	*"PEI may occur in patients with diarrhoea-predominant irritable bowel syndrome (Level 2b). Treatment with PERT may reduce diarrhoea and abdominal pain (Level 3b)."*

1. Thomas P. *et al. Gut* 2003; 52(Suppl V):v1–v15. 2.Pancreatology 2015; 193;461-467. 3. Sweetser S. *Mayo Clin Proc*. 2012; 87(6):596-602.

IS EARLY DETECTION OF CHRONIC PANCREATITIS POSSIBLE?

Endoscopic ultrasound (EUS) | MRI | Computed tomography

Lennon A et al, Cancer Research; 74 (13); 1-9, 2014

AMERICAN PANCREATIC ASSOCIATION GUIDELINES FOR DIAGNOSIS OF CHRONIC PANCREATITIS

If inconclusive or non diagnostic Proceed to next step

Clinical signs and symptoms of chronic pancreatitis
Abdominal pain, weight loss, steatorrhoea, malabsorption, history of alcohol abuse, recurrent acute pancreatitis, fatty food intolerance
Perform history, physical exam, review of laboratory studies, consider faecal elastase measurement

Step	Test	Criteria
Step 1	CT scan	Calcifications in combination with atrophy and/or dilated duct
Step 2	MRI/MRCP with secretin enhancement	Cambridge Class III, dilated duct, atrophy of gland, fillings defects in duct suggestive of stones
Step 3	Endoscopic Ultrasound (EUS)	≥ 5 UES CP criteria
Step 4	Pancreas function test (with secretin)	Peak (bicarbomate) < 80 meq/L
Step 5	Endoscopic Retrograde Cholangiopancreatography (ERCP)	Cambridge III, dilated main pancreatic duct and > 3 dilated side branch

Chronic pancreatitis

Inconclusive or non diagnostic results require monitoring and repeat testing after 6-12 months

Adapted from Conwell D. *et al. Pancreas* 2014; 43:1143-1162.

HOW IS PEI DETECTED?

DIRECT TEST:

- SECRETIN-CAERULEIN TUBULAR TEST

INDIRECT TESTS:

- 3 DAY FAECAL FAT TEST (GOLD STANDARD)
- **FAECAL ELASTASE-1 STOOL TEST**
- 13C MIXED TRIGLYCERIDE BREATH TEST

FAECAL ELASTASE-1 STOOL TEST

- FAECAL ELASTASE-1 TEST IS BECOMING MORE COMMON IN CLINICAL PRACTICE[1]
- IN 2010, IT WAS REPORTED TO BE THE MOST POPULAR TEST USED TO EVALUATE PEI[2]
- REQUIRES A SINGLE FORMED STOOL SAMPLE[2]
- MEASURES THE ELASTASE CONCENTRATION IN THE STOOL[1,2]
- SPECIFICITY: APPROXIMATELY 93%[3]

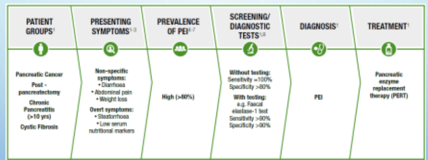
>200 µg/g stool: normal value[2]

<200 µg/g stool: mild PEI[1]

<100 µg/g stool: severe PEI[1]

1. Toouli J. et al. MJA 2010 2. Sikkens E. *et al. Best Pract Res Clinical Gastroenterol.* 2010; (24):337-347. 3. Loser C. *et al. Gut* 1996; 39: 580-586.

PEI DIAGNOSTIC PATHWAY

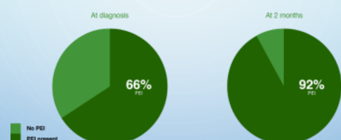


1. Toouli J. *et al. MJA* 2010; 193;461-467. 2. Thomas P. *et al. Gut* 2003; 52(Suppl V):v1-v15. 3. Lindkvist B. *et al. Pancreatology* 2012; 12; 305-310. 4. Dietitians Assoc of Australia. Australasian Clin. Prac. Guidelines for Nutr in Cystic Fibrosis. Sept 2006. 5. Sikkens E. *et al. J Clin Gastroenterology* 2014. ; 48: e43-e46. 6. Sikkens E. *et al. BJS* 2014; 101: 109-113. 7. Dumasy V. *et al. Am J Gastroenterology* 2004; 99(7):1350-1354. 8. Loser C. *et al. Gut* 1996. 39: 580-586.

A FEW WORDS ABOUT PEI AND PANCREATIC CANCER…

PEI AND PANCREATIC CANCER

PEI PREVALENCE IN UNRESECTABLE PANCREATIC CANCER



Prospective study in 32 patients with newly diagnosed unresectable cancer of pancreatic head region recruited between 2010 and 2012, followed up for at least 6 months. PEI determined using faecal elastase-1 stool test <200 mcg/g.

Sikkens E. et al. J Clinical Gastroenterology 2014; 48(5):e43–e46

QUALITATIVE RESEARCH: IMPACT OF PEI ON QOL IN UNRESECTABLE PANCREATIC CANCER

"Participants identified that their priority unmet supportive care need was their difficulty in managing gastrointestinal problems, diet and digestion. They expressed strong feelings of frustration and anger relating to struggling with symptoms of PEI"

"I found this very confronting, her not wanting to eat. I (crying) try to force feed her. She gets upset, it makes it worst."
Carer, male (Dad)

"I just can't get enough nutrition you know…"
Patient, female

"You've got this lack of food intake. I can't eat as much of what I used to and there are things that I can't eat."
Patient, female

Qualitative research conducted by the NSW Cancer Council, in 61 people including patients diagnosed with pancreatic cancer, carers, family members, and bereaved participants.

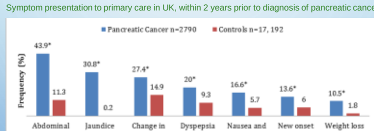
Gooden H. & White K. Support Care Cancer 2012.

A SUBSTANTIAL TIME LAG OCCURS BETWEEN SYMPTOM PRESENTATION TO DIAGNOSIS OF PANCREATIC CANCER

UK case control study involving 2773 patients with pancreatic ductal adenocarcinoma (PDAC)

Mean number of visits to GP = 18
Mean number of "alarm" (non specific) symptoms = 11

Symptom presentation to primary care in UK, within 2 years prior to diagnosis of pancreatic cancer



Adapted from Keane et al, BMJ, 2014
* Pancreatic cancer versus controls, P<0.001
# Symptoms with greatest frequency (>10%) shown

Keane M. *et al. BMJ Open* 2014. 4:e005720.

MANAGEMENT

LIFESTYLE MODIFICATION

- AVOID EXPOSURE TO OBVIOUS RISK FACTORS
  - ALCOHOL
  - SMOKING
- ENZYME SUPPLEMENTATION (PERT)
- SMALL MEALS FREQUENT MEALS

ADDITIONAL MANAGEMENT

- ANALGESIA
  - SIMPLE
  - NEUROLEPTICS EG TCA, GABAPENTOIDS
  - DECOMPRESSION
    - ENDOSCOPIC
    - SURGICAL
    - ESWL

PERT TREATMENT GOALS[1]

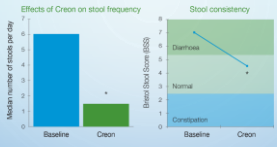
- ELIMINATE MALDIGESTION
- ELIMINATE MALABSORPTION
- MAINTAIN ADEQUATE NUTRITION

1. Toouli et al. MJA 2010; 192: 661-667

DELIVERY OF PANCREATIC ENZYMES USING A MODERN ORAL FORMULATION

1. The capsule containing pancreatic enzymes enters the stomach along with the food.
2. The outer capsule dissolves rapidly to release enteric coated mini-microspheres
3. The mini-microspheres pass through the pylorus together with the chyme.
4. The active digestive enzymes are released in the duodenum to digest nutrients.

EFFECTS OF PERT ON GI SYMPTOMS (PEI IN CHRONIC PANCREATITIS)



*p<0.002 vs IBS-D patients with normal Fe- I levels
Open label study, n=19, t=12 weeks, all patients with PEI: FE-1 <100 µg/g stool.
Dose: Creon 30,000 units three times daily.

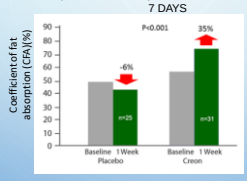
Patients on pancreatic enzyme therapy (Creon) showed a clinically significant response:

- Stool frequency reduced from 6 to 1.5 per day (p<0.002)
- Stool consistency changed from "diarrhoea" to "normal" (p<0.002)

Observational study involving 19 patients identified with PEI using the faecal elastase-1 stool test. Patients were treated with Creon 30,000 units lipase with meals for 12 weeks. Patient symptoms were recorded using Bristol stool scale and the number of stools per day.

EFFECT OF PERT ON FAT MALABSORPTION IN PATIENTS WITH PANCREATIC EXOCRINE INSUFFICIENCY POST PANCREATIC SURGERY

A RANDOMISED, DOUBLE BLIND, PLACEBO CONTROLLED STUDY OVER 7 DAYS

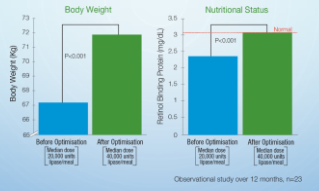


58 patients with pancreatic exocrine insufficiency after pancreatic resection due to malignancy or chronic pancreatitis.

PERT SIGNIFICANTLY IMPROVES FAT ABSORPTION BY 35% AFTER ONE WEEK.

Seiler C. et al, Aliment Pharm & Ther, 2013

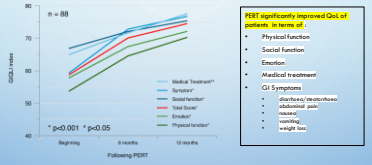
EFFECTS OF PERT ON BODY WEIGHT AND NUTRITIONAL STATUS



Observational study over 12 months, n=23

Observational uncontrolled study involving 20 patients with pancreatic exocrine insufficiency associated chronic pancreatitis. At baseline, these patients were treated with pancreatic enzyme replacement therapy with the dosage titrated to avoid the symptoms of weight loss and diarrhoea. The dosage was increased and titrated to achieve normal fat absorption as determined by 13C mixed triglyceride breath test. This treatment was continued for one year.

EFFECTS OF PERT ON THE QUALITY OF LIFE (QOL) OF PATIENTS WITH CHRONIC PANCREATITIS

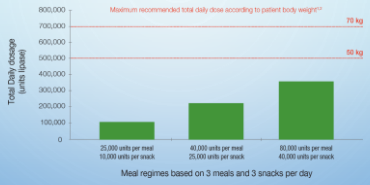


PERT significantly improved QoL of patients in terms of :

- Physical function
- Social function
- Emotion
- Medical treatment
- GI Symptoms
  - diarrhoea/steatorrhoea
  - abdominal pain
  - nausea
  - vomiting
  - weight loss

Observational prospective, multicentre study which assessed symptom and quality of life over one year in patients with newly diagnosed PD associated with chronic pancreatitis without prior pancreatic enzyme treatment. Quality of life was assessed using gastrointestinal quality of life index (GIQLI).

PERT ADULT DOSE RANGE



Maximum dose recommended by:
1. Cystic Fibrosis (CF) Consensus Conference - Creon Product Information
2. Australasian Guidelines for Management of Pancreatic Exocrine Insufficiency (Toouli, et al. MJA 2011; 193(8): 461–467).

MANAGEMENT OF PEI USING PERT

PERT:

- INITIALLY – 25,000 TO 40,000 UNITS LIPASE WITH EACH MEAL
- ENCOURAGE PATIENTS TO EAT 6 SMALLER MEALS PER DAY RATHER THAN 3 LARGE MEALS
- IF REQUIRED, INCREASE DOSE UP 80,000 LIPASE UNITS WITH EACH MEAL

OTHER CONSIDERATIONS:

- PATIENT COMPLIANCE
- MANY PATIENTS HAVE ACIDIC INTESTINAL PH WHICH DECREASE ENZYME RELEASE FROM PREPARATIONS WHICH HAVE PH SENSITIVE ENTERIC COATING
  - ACID SUPPRESSING AGENTS MAY BE REQUIRED IN SOME PATIENTS
- LACK OF WEIGHT GAIN DUE TO INADEQUATE FAT INTAKE
  - FAT RESTRICTION NOT REQUIRED WITH PERT

1. Creon Product Information. 2. Toouli J, et al. MJA 2010; 193: 466–467.

SUMMARY

- COMMON
- SIGNIFICANTLY UNDER-DIAGNOSED
- UNRECOGNISED DISEASE CAN LEAD TO POOR QOL, HEALTH COMPLICATIONS AND REDUCED SURVICAL
- SYMPTOMS CAN BE NON-SPECIFIC
- NEED TO THINK OF IT!!!

FUTURE DIRECTIONS

- APC INITIATED DEVELOPMENT OF A DIAGNOSTIC TOOL
- BASED ON WORK DONE IN UK FOR PANCREATIC CANCER
- BROADENED TO ALSO INCLUDE
  - CHRONIC PANCREATITIS
  - PANCREATIC EXOCRINE INSUFFICIENCY
- PHASE 1 DEVELOPMENT PHASE (CURRENT)
  - LITERATURE REVIEW
  - DELPHI PROTOCOL
- PHASE 2 - VALIDATION PHASE
  - GENERAL PRACTICES TO UTILIZE PROSPECTIVELY