Nutritional Management of Necrotizing Pancreatitis: A Case Report

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Background

Necrotizing pancreatitis is severe acute inflammation of the pancreas that affects the release of pancreatic enzymes necessary for digestion and the production of insulin needed to stabilize blood glucose levels. Common complications associated with necrotizing pancreatitis include diet intolerance, nausea, vomiting, decreased oral intakes, and hyperglycemia. If the patient cannot meet their estimated energy requirements via an oral diet, supplemental nutrition support, such as enteral nutrition through a feeding tube or parenteral nutrition through a peripheral or central line, must be considered to prevent malnutrition. Additionally, insulin therapy may be utilized in cases where patients experience hyperglycemia due to exocrine pancreatic insufficiency.[1] This case study evaluates how to navigate enteral nutrition intolerance and the management of hyperglycemia when treating necrotizing pancreatitis.

Nutritional Considerations

An oral diet is the preferred method of delivering nutrition. However, if the patient can not meet their energy and protein needs through oral feedings, then enteral nutrition should be considered. Parenteral nutrition should only be utilized if a contraindication for enteral nutrition is present or if the patient can not meet their nutritional needs through enteral nutrition.[1,2]

Oral Diet:

- An oral diet should be reinitiated as soon as possible.[3]
- Low fat, soft, or full liquid diets may result in better diet tolerance by reducing the secretion of pancreatic enzymes.[4]

Enteral Nutrition (EN):

- Early initiation within 24-48 of admission is associated with shorter hospital stays.[5]
- EN prevents gut permeability and bacterial translocation, which can lead to sepsis.[1]
- Elemental formulas can increase diet tolerance and decrease post prandial pain.[1]
- Feed through the jejunum to decrease pancreatic enzyme secretion.[2]

Parenteral Nutrition (PN):

- Consider PN is gastroparesis or ileus is present.[1]
- Lipid emulsions are appropriate if the cause of pancreatitis is not from hyperlipidemia.[1]

Nutritional Considerations

Hyperglycemia definition:

- Hyperglycemia is defined as a blood glucose level greater than 140 mg/dL.[6]

When to start insulin therapy:

- When a patient experiences a blood glucose level >/= 180 mg/dL at least twice in a 24-hour period.[6]

Goal Ranges:

- The goal blood glucose range is 140-180 mg/dL or 110-140 mg/dL for patients not at risk for hypoglycemia.[6]

Case Report

Case Summary: 27-year-old female admitted with chief complaint of abdominal pain. Transferred from a smaller hospital for abdominal pain and GI evaluation. History of seizures, anxiety, and depression. Pt developed necrotizing pancreatitis after robotic laparoscopic cholecystectomy 4 months PTA. Discharged from previous hospital admission 3-days prior on full liquid diet.

Assessment:

Height: 5'7', Weight: 99.8 kg (220 lbs), BMI:34.46 kg/m^2
Weight changes: Upon admission-23% weight loss x 1 month (significant)
During admission: 5.3% weight loss in 2 months (not significant)

Nutrition Diagnosis:

Inadequate oral intake related to abdominal pain/nausea as evidenced by need for enteral nutrition via small bowel feeding tube.

Intervention:

Estimated energy needs: Kcals: 1896-2370 kcal/d (20-25 kcal/kg) | Mifflin St. Jeor: 2117 kcal/day[7]
Protein:79-122 gm protein (1.3-2 gm/kg X IBW), Fluid: 1896-2370 ml fluid/day
Feeding tube was placed in a post pyloric position 48 hours after admission. Started pleasure feeds on a clear liquid diet and transitioned to a full liquid diet once tolerated. Started on at specialty elemental formula at 65 ml/hr (1872 kcal, 117 grams protein, 1265 ml FW). Transitioned to standard formula at 70 ml/hr due to insurance issues (2016 kcal, 93 grams protein, 1378 ml FW). Met goal rate on specialty elemental formula of 65 ml/hr. Did not meet goal rate on standard formula of 70 ml/hr. Met 76% of kcal needs, 85% of minimal protein needs, and 52% of fluid needs on standard formula that was covered by insurance.

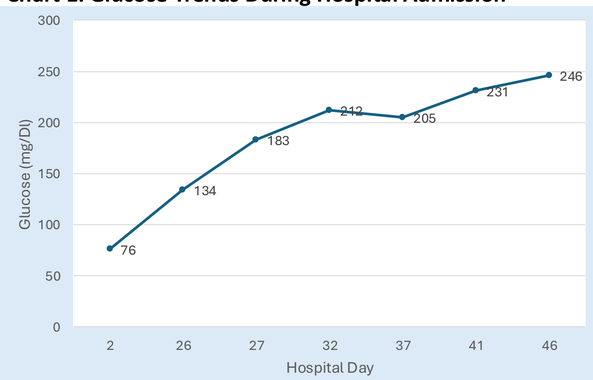
Outcomes:

Considered switching to a formula better suited for blood glucose control. However, did not switch to another formula due to tolerance/insurance issues. Continued sliding scale insulin management despite persistent hyperglycemia. Continue oral FLD as tolerated. Continue EN via feeding tube placed in a post pyloric position for pain management.

Table 1: Lab Values Compared to Reference Range

Glucose 70-180 mg/dL	**Day 2** 76 (WNL) **Day 46:** 246 (H)	**AST 8-33 U/L**	**Day 2** 40 (H) **Day 46** 74 (H)
Amylase 30-110 U/L	**Prior to admission** 61 (WNL)	**Lipase 0-2.67 microkat/L**	**Prior to admission** <4 (L)
ALT 7-56 U/L	**Day 2** 58 (H) **Day 46** 125 (H)	**Triglycerides <150 mg/dL**	**Prior to admission** 281 (H)

Chart 1: Glucose Trends During Hospital Admission



Discussion & Practice Application

The use of an elemental formula increased diet tolerance.[1] The elemental formula is a peptide-based and requires less digestion. This formula also contains fish oil to decrease inflammation and promote a healthy immune system. The feeding tube placed past the stomach and into the jejunum decreases the likelihood of post prandial pain while the pancreas is in an inflammatory state.[2] The hyperglycemia indicates that the pancreas is not able to produce insulin efficiently. It would have been beneficial to transition to a basal bolus insulin management method instead of sliding scale.[6] Lastly, pancreatic enzymes are used when there are signs of pancreatic exocrine insufficiency. Pancreatic enzymes will exacerbate symptoms if used inappropriately. Obtaining more recent lipase and amylase labs could have helped indicate if pancreatic enzymes could have been a beneficial addition to the treatment plan.[8]

Conclusions

Specialty, elemental formulas should be utilized when patients with necrotizing pancreatitis are struggling to tolerate standard, polymeric formulas.[1] When administering enteral nutrition, positioning the DHT past the stomach and into the jejunum can increase diet tolerance and reduce post prandial pain.[2] Lastly, the American Diabetes Association recommends using basal bolus insulin regimen for non critically ill hospitalized patients with poor oral intakes.[6] In conclusion, if the patient in the case study did not have insurance issues, they would have likely done best if they had continued their enteral nutrition regimen with a specialty, elemental formula. Additionally, the sliding scale method did not seem to keep the patient's blood glucose levels stable, and they should have transitioned to a basal bolus method.

References

1. Mueller C. Pancreatitis. *The ASPEN adult nutrition support core curriculum*. Third edition. American Society for Parenteral and Enteral Nutrition; 2017.
2. Crockett SD, Wani S, Gardner TB, et al. American Gastroenterological Association Institute Guideline on Initial Management of Acute Pancreatitis. *Gastroenterology (New York, NY 1943)*. 2018;154(4):1096-1101. doi:10.1053/j.gastro.2018.01.032
3. ESPEN guideline on clinical nutrition in acute and chronic pancreatitis. Arvanitakis, Marianna et al. Clinical Nutrition, Volume 39, Issue 3, 612 – 631.
4. Yaceczko S. Pancreatitis (2022). Nutrition Care Manual. 2022. Accessed November 10, 2024. https://www.nutritioncaremanual.org/topic.cfm?ncm_category_id=1&lv1=5522&lv2=275088
5. Swaroop S. Management of acute pancreatitis. UpToDate. March 19, 2024. Accessed November 10, 2024. https://www.uptodate.com/contents/hypertriglyceridemia-induced-acute-pancreatitis?search=hypertriglyceridemia%2Bpancreatitis&selectedTitle=1~150&usage_type=default&display_rank=1.
6. Academy of Nutrition and Dietetics. AWM: estimating resting metabolic rate (RMR). EAL. 2024. Accessed November 10, 2024. https://www.andeal.org/topic.cfm?menu=5276&cat=5350.
7. Diabetes care in the hospital: standards of medical care in diabetes-2022. *Diabetes care*. 2022;45(Suppl 1):S244-S253. doi:10.2337/dc22-S016
8. Phillips ME, Hopper AD, Leeds JS, et al. Consensus for the management of pancreatic exocrine insufficiency: UK practical guidelines. *BMJ open gastroenterology*. 2021;8(1):e000643-. doi:10.1136/bmjgast-2021-000643