

Severe Hypertriglyceridemia- Induced Acute Pancreatitis: Medical and Nutritional Implications

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Case Study

- 28 y.o AAF
- Adm AAMC 9/16/07
- Ht.= 5'1" Wt.= 143 lbs (65 kg) BMI= 27 IBW=105
% IBW= 136
- 36 wk. gestation
- Abdominal pain, nausea, vomiting
- PMH: Anemia, Asthma, Severe
Hypertriglyceridemia (1125mg/dL July 2007)
- Social Hx: Adopted, married, 1 child, Police
Officer.
- Denies: alcohol, smoking, recreational drugs

Overview

- Hypertriglyceridemia
 - Medical Management
 - Nutritional Management
- Acute Pancreatitis
 - Medical Management
 - Nutritional Management
- Case Discussion
- Implications to Practice of Dietetics

Hypertriglyceridemia

- Risk Factors
 - Primary (familial): Genetic defect
 - Secondary: Diet, DM, Obesity, Hypothyroidism
- Clinical Presentation
 - eruptive xanthomas, or
 - lipemia retinalis
- Diagnosis
 - Lipid Profile
 - Normal Triglyceride < 150 mg/dL
 - Total cholesterol, LDL, HDL
 - Liver function tests
 - Thyrotropin level, serum urea nitrogen, creatinine, and urinalysis for thyroid and renal function
- Fasting hyperglycemia, hypertension, abdominal obesity, and HDL levels

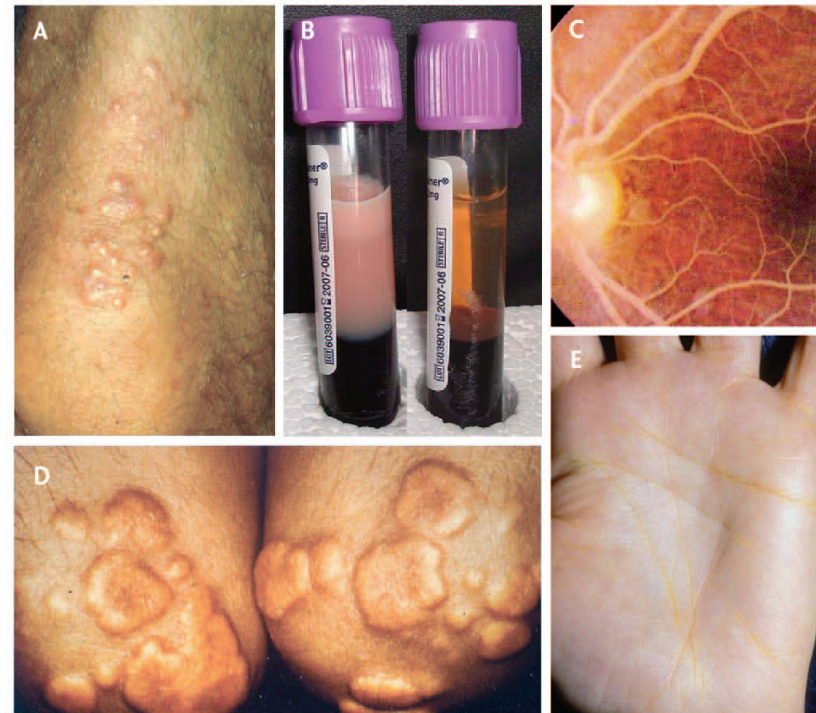


Fig. 1: Clinical manifestations of primary hypertriglyceridemia. **A:** Eruptive cutaneous xanthomas. **B:** Lipemic plasma. Whole blood has been allowed to stand at 4°C overnight. The sample on the right comes from a normolipidemic subject. **C:** Lipemia retinalis. **D:** Tuberous xanthomas. **E:** Palmar crease xanthomas .

Hypertriglyceridemia: Nutritional Management

- Goal
 - Prevent pancreatitis
 - Decrease risk for cardiovascular disease
- Nutrition Concern
 - ↑ fat to 35%, ↓ carbohydrate %, will ↓ triglycerides may hinder weight loss
 - If genetic defect, require very low-fat diet (<15%)

Hypertriglyceridemia: Nutritional Prescription

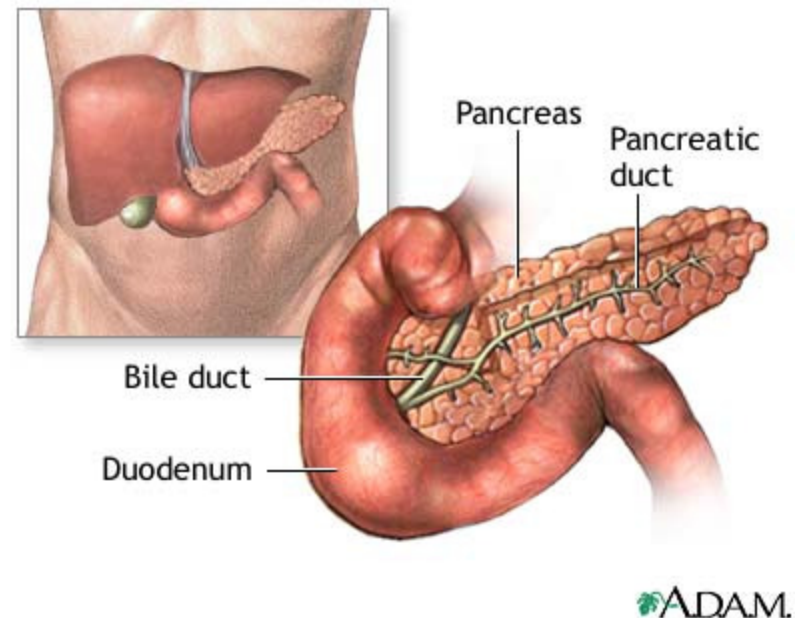
- Therapeutic Lifestyle Change (TLC)
 - Counseling- weight management, healthy diet, regular exercise
 - Alcohol and smoking cessation
 - Total fat 25-35% of total calories
 - Saturated fat <7% of total calories
 - Carbohydrates 50-60% total calories
 - Protein ~15% of total calories
 - Fiber 20-30 gm/day
 - Cholesterol < 200 mg/day
 - Low-fat grains, legumes, fruits, vegetables, and nonfat dairy
 - Soluble fiber and plant sterols and sterol esters
- Monitor and Evaluation: Lab values, diet and weight changes

Hypertriglyceridemia: Medical Management

- Initiate if unable to reduce TG to < 200 mg/dL with TLC
- Control underlying diseases
- If Triglyceride level 200-500 mg/dL:
 - Normalize LDL and nonHDL
 - Raise HDL > 40 mg/dL
- If Triglyceride level > 500 mg/dl
 - Lower triglyceride level to prevent pancreatitis
- Fibrates, statins, niacin, and fish oil
 - Combination therapy for mixed dyslipidemia

Acute Pancreatitis

- Inflammation of the pancreas
- Risk Factors
 - Alcohol abuse, cholelithiasis, hypertriglyceridemia
- Clinical Presentation
 - persistent and radiating upper abdominal pain (generally worse with meals), low-grade fever, nausea, and vomiting
- Diagnosis
 - \uparrow Amylase, \uparrow Lipase, \uparrow Glucose, \uparrow WBC, \uparrow Liver Function tests
 - Acute or Chronic
 - Severity
 - Ranson criteria or APACHE III scoring systems
 - Necrosis on CT scan



Acute Pancreatitis: Nutritional Management

- Goal
 - Minimize pancreatic stimulation
 - Provide adequate protein and energy to meet needs
- Nutrition Concerns
 - Increased energy expenditure, increased muscle catabolism and proteolysis
 - Reduced oral intake
 - Nutrient losses- maldigestion, malabsorption, diarrhea
 - Hyperglycemia and insulin resistance
 - Electrolyte and micronutrient deficiencies

Acute Pancreatitis: Nutrition Prescription

- NPO- “Pancreatic rest” with IV hydration
- Advance to liquids as symptoms and labs improve
- Advance to solid foods - ↑ protein, ↓fat
- Multivitamin-mineral supplement
- Nutrition Support
 - Options
 - Total enteral nutrition (EN)
 - Total parental nutrition (TPN)
 - Standard Therapy
 - Type depends on severity of disease, duration, and tolerance
 - Education on food choices

Nutrition Support

- Enteral Nutrition
 - EN is first choice over TPN
 - Does not appear to increase pancreatic secretions
 - No difference in mortality for EN vs. TPN
 - Cost-effective, ↓ complications
 - Enteral tube placement
 - Distal portion of duodenum or into jejunum
- Total Parental Nutrition
 - prolonged ileus, fistula, no enteral access, inability to advance feeding
 - Based on individual requirements for CHO, Protein, Fat, Fluid, Electrolyte

CAM Therapy

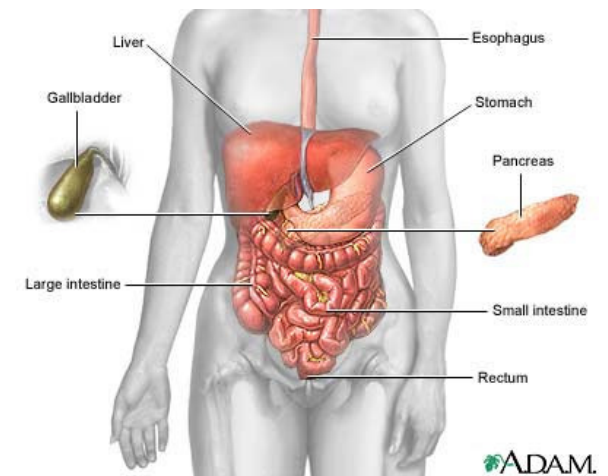
- Hyperlipidemia
 - Guggul (Ayurvedic)*
 - Fenugreek
 - Psyllium
 - Red yeast rice
- Pancreatitis
 - Antioxidants
 - Vitamin C, E, Betacarotene, Selenium
 - Grape seed extract*



Grape seed

Acute Pancreatitis: Medical Management

- Aggressive rehydration
- Pain relief
- Medications
 - Antacids (H₂-receptor antagonists or proton pump inhibitors)
- Monitoring of hemodynamic status and laboratory/serum parameters



Case Discussion

- July 07: Hypertriglyceridemia diagnosed
- No meds- Statins contraindicated, fibrates are Pregnancy Category C. Fish oil considered
- Nutrition consult for low fat diet
 - Low-fat diet and athletic pre-admission
- 9/16: Presented with abd pain, nausea, vomiting
- Seizure after Epidural lidocaine
- Emergent cesarean due to fetal distress
- Delivered preterm female by cesarean
- ↑Amylase, lipase, and liver functions
- CT scan + pseudocyst, + phlegmon, no necrosis

Case Discussion (Cont'd)

- Diagnosed with Pancreatitis
- Febrile, + ileus, abdominal pain
- Nutrient needs:
 - 1500-1800 cal/day (23-28 kcal/kg)
 - 52-60 grams protein/day (0.8-0.9 g/kg protein)
- 9/21- Unable to advance diet, TPN initiated
- Breastfeeding attempts terminated
- 10/5- Discharged home on TPN
- 10/31: Readmitted
- New PICC Line inserted due to infection
- 10/31- CT scan: No pseudocysts, less fluid
- 11/5- Discharged home on TPN and antibiotics

Labs

Lab	Normal Value	9/16	9/24	9/30	10/4	11/5
Na	136-144 mEq/L	127	130	136	137	142
K	3.5-5.0 mEq/L	5.6	4.4	4.2	4.2	3.9
BUN	8-23 mg/dL	<5	13	14	10	<5
Crea	0.4-1.2 mg/dL	0.6	0.6	0.8	0.7	0.9
Glu	70-99 mg/dL	110	89	99	85	107
WBC	5-10 x 10 ³ /mm ³	15.3	19.7	12.9	13.9	4.5
Platelets	177- 406 x 1000/ μ L	161	222	499	500	191
Mg	1.3-2.1 mEq/L	-----	2.2	2.0	1.9	-----
Phos	2.3-4.3 mg/dL	-----	3.4	3.9	4.2	4.4
Chol	Desirable 120-199 mg/dL	514	122	122	101	149
TG	Desirable < 150 mg/dL	726	398	264	381	291
HDL	Desirable 40-60 mg/dL	17	<17	----	-----	----
LDL	Optimal < 100 mg/dL	29	38	-----	-----	-----
Amylase	30-110 U/L	123	83	141	138	113
Lipase	16-63 U/L	448	51	95	94	77
LDH	105-230 U/L	-----	425	420	487	167
AST	10-31 U/L	38	40	37	42	38
ALT	4-31 U/L	8	15	16	27	22

Medications

Medication	Indication	Food/Drug Interaction
Fentanyl patch	Analgesic, Narcotic	↑ Amylase and Lipase Anorexia
Propofol	Sedative	↓ Renal function ↑Triglycerides Not with egg or soy allergy
Levaquin	Antibiotic	Orange juice ↓ drug level 2 hours before or after antacids
Furosemide	Diuretic	Avoid natural licorice ↓ K, Mg, Na
Novolog SSI	Hypoglycemic	↑ Weight Alcohol ↑ hypoglycemia
Enoxaparin	Anticoagulant	Not with pork allergy- from pork intestinal mucosa
Promethazine HCL	Antiemetic	↑ Glucose Avoid Alcohol
Metronidazole	Antibiotic, Antimicrobial	Metallic taste Avoid alcohol, may cause disulfuram-like reaction
Labetalol	Antihypertensive	Avoid natural licorice May mask symptoms hypoglycemia
Acetaminophen	Analgesic, Antipyretic	↑ Vitamin C ↑toxicity ↑ Alcohol ↑hepatotoxiicty

TPN Prescription

Nutrient	9/24	9/27	9/30	10/1	10/4
AA	60	60	60	60	50
Dextrose	375	275	250	250	250
Lipid	None	None	35	35	15
Protein	60	60	60	60	50
Total calories (kcal/kg)	1175 (18)	1175 (18)	1505 (23)	1505 (23)	1200 (18)
Calorie needs kcal/kg	1800 (28)	1800 (28)	1800 (28)	1800 (28)	1800 (28)
% Calorie needs	65	65	85	85	75
Protein needs gm/kg	60 (0.9)	60 (0.9)	60 (0.9)	60 (0.9)	60 (0.9)
% Protein needs	100	100	100	100	83

Implications of Finding to Practice of Dietetics

- **Application of the Nutrition Care Process**
 - **Goal:** Pt will be able to identify 3 low-fat food choices and 3 high fiber food choices by reading food labels.
 - **Diagnosis:** Food and Nutrition-related knowledge deficit related to low-fat, high fiber food choices as evidenced by frequent consumption of ice cream and simple carbohydrates.
 - **Intervention:** Instruct patient on reading labels for identification of fat and fiber content. Instruct on low-fat and high fiber food choices.
 - **Monitoring and Evaluation:** Lab values after 3-6 months, food recall, patient response to questions about food sources of fat and fiber.

 - **Goal:** TPN will meet 100% of patients calorie and protein needs.
 - **Diagnosis:** Inadequate intake from enteral-parental nutrition infusion related to no lipids in TPN due to hypertriglyceridemia as evidenced by TPN meeting 65% caloric and 100% protein needs.
 - **Intervention:** Refer to other provider. PN per PharmD. Advance diet per MD. B.S. controlled. Suggest ↑Dextrose in TPN to better meet nutritional needs.
 - **Monitoring and Evaluation:** Lab values, weight, nutrient composition in TPN

Implications of Finding to Practice of Dietetics

- Enteral nutrition as first choice of feeding
 - Although EN preferred, TPN is used most often
 - Comfort of clinicians with TPN
 - EN placement in small bowel recommended
- TPN ordering privileges
 - RD vs. PharmD
 - Predictive equation for nutrient needs may vary

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