Cardiovascular Endocrinology

CARDIOVASCULAR ENDOCRINOLOGY AND LIPIDS DISORDERS CASE REPORT

Impact of Provider-Directed Plant-Strong Nutrition & Counseling on Cardiometabolic Health: A Case Series at the Michael E. DeBakey VA Medical Center

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Background: Cardiometabolic syndrome, Type 2 diabetes mellitus (DM), and non-alcoholic fatty liver disease (NAFLD) share common pathogenic mechanisms including inflammation, insulin resistance, lipid accumulation, and increased oxidation. Diet is an important modifiable determinant in cardio-metabolic diseases (CMD) progression. The clinician/specialist provides pharmacotherapeutic guidance, but often defers nutrition guidance to supportive services. We present the impact of specialist-directed nutrition counseling for 3 patients with various manifestations of CMD.

Clinical Case Series: A 63-year-old man with Type 1DM, status post coronary artery bypass grafting (CABG), reported high animal fat/protein intake, very low carbohydrate (CHO) intake and soda consumption. The specialist educated the patient on anti-inflammatory benefits of plant-strong nutrition, recommended liberalizing healthy CHO, grains, fruits and vegetable intake, limiting animal products to 1 serving daily and eliminating processed foods and beverages. The patient followed the diet, lost 50 pounds in 7 months with improvement in blood pressure and lipids. Insulin requirements reduced by 50% while maintaining HbA1C 7%.

A 71-year-old man with T2DM, NAFLD, obesity, coronary artery disease status post CABG, HbA1C 9.6% reported increased fatigue, depressive symptoms, and maladaptive coping strategies including excessive alcohol consumption. The endocrinologist recommended plant-strong nutrition for weight loss and glycemic benefits, reduced animal fat/protein consumption and complete elimination of alcohol intake. The patient adopted plant-based nutrition and stopped alcohol consumption. After 18 months, he lost 100 pounds, achieved HbA1C 7.6%, without additional medication.

A 63-year-old man with Crohn's disease, NAFLD, obesity, referred for NAFLD, reported consuming six servings of soda, unchecked fried foods with limited vegetable intake. Exam was notable for abdominal adiposity. The endocrinologist recommended to eliminate soda and fried foods. The patient initially declined, but after 4 months of continued reinforcement, he adopted a plant-forward diet. After 2 years, the patient lost 160 pounds and transaminitis resolved. All specialist-directed nutrition counseling was in accordance with American Heart Association and American Diabetes Association recommendations for macronutrient and micronutrient nutrition consumption.

Conclusion: These cases signify how provider-directed nutrition counseling can have an impact on CMD. The first step to integrate nutrition counseling into practice is to become well-versed in basic concepts of nutrition science and develop a broader understanding of nutrient composition. We therefore encourage the integration of nutrition science into medical curricula that could translate into improved cardiometabolic health outcomes.

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Importance of Diet Modification in Preventing Recurrent Episodes of Hypertriglyceridemic Pancreatitis (HTGP)

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Background: Hypertriglyceridemic pancreatitis (HTGP) typically occurs in patients with an underlying dyslipidemia. While the incidence is low (2–4%), HTGP has a higher likelihood of recurrence than other forms of pancreatitis. A multifaceted approach is necessary to prevent recurrences of HTGP. Diet modification is an integral part of management, but is usually not well emphasized in this patient population.

Clinical Case: A 22 year old male with hx of recurrent pancreatitis due to familial hypertriglyceridemia presented to the emergency department with epigastric pain beginning on morning of admission. The patient's 1st pancreatitis episode was 1 year ago and he had 8 incidences of pancreatitis due to elevated triglyceride levels. One episode required ICU stay due to pressor requirement. Patient noted medication compliance to gemfibrozil since this admission, however stated that he had not made any changes in his diet since diagnosis 1 year ago. Patient had been abstinent from alcohol and drugs 6 months prior to admission. Patient's triglyceride level on admission was 1,203 and was started on insulin drip. However, due to persistent hypoglycemia was also placed on D5 mIVFs. Despite the fluids, patient continued to be hypoglycemic and insulin drip was stopped for a short period of time with the triglyceride level in the 700s. The following night, patient was placed back on insulin drip at higher rate and became hypoglycemic again. Consequently, insulin drip was turned off the following morning. Triglyceride level continued to downtrend to 510. Insulin drip was restarted at a lower rate later that day. A recheck of triglyceride level that day showed that triglyceride decreased to 470. Patient was placed back on gemfibrozil with niacin added to the regimen and discharged home after a detailed discussion about diet changes.

Discussion: This case study illustrates a patient with multiple episodes of pancreatitis due to elevated triglyceride levels despite compliance to gemfibrozil, resulting in refractory hypoglycemic episodes during his most recent admission from chronic damage to the pancreas's alpha cell activity. While medication compliance is important, diet modification is as well. The above case sheds light on the importance of long-term diet modification in patients including restriction of dietary fat, simple carbohydrates and alcohol.

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PCSK9 Inhibitors for the Management of Mitotane-Induced Hypercholesterolemia in Adrenocortical Carcinoma

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Background: After surgical resection in adrenocortical carcinoma (ACC), mitotane is often used as adjuvant therapy. However, mitotane can cause adverse effects, such as inducing hypercholesterolemia by stimulating HMG-CoA reductase. In addition, mitotane is a strong CYP3A4 inducer which presents a challenge with statins, such as lovastatin, simvastatin, and atorvastatin. We present a case using a PCSK9 inhibitor in mitotane-induced hypercholesterolemia which was refractory to the maximum dose of rosuvastatin.
Clinical Case: A laparoscopic left adrenalectomy was performed on a 45-year old female with Stage 3 (T3, NX, M0) ACC (4.5 x 3.4 x 3.2 cm). Her ACC was determined to be high grade with a mitotic rate 20/50 HPF and Ki-67 of 18.7% with lymphovascular invasion and tumor invasion of periadrenal adipose tissue. Following surgical resection, she started adjuvant therapy mitotane and oral hydrocortisone replacement, as well as 6 weeks of radiation therapy. Prior to starting mitotane, her LDL-C was 133 mg/dL (normal range <130 mg/dL) and treated with simvastatin 40 mg daily. A drug interaction was identified between simvastatin and mitotane, with mitotane reducing effects of simvastatin via CYP3A4 induction, so rosuvastatin 10 mg daily was started instead. A trial of combination rosuvastatin and ezetimibe was used; however, patient discontinued ezetimibe due to reported side effects. As the dose of mitotane increased to achieve a blood concentration of 14–20 mcg/mL, LDL-C simultaneously increased along with a corresponding dose increase of rosuvastatin. While being on mitotane 2 g daily and rosuvastatin 40 mg daily, her lipids peaked with LDL-C 219 mg/dL. The decision was made to start evolocumab administered as 140 mg subcutaneously every 2 weeks in addition to rosuvastatin 40 mg daily. After 4 months of therapy with combination evolocumab and rosuvastatin, her LDL-C decreased to 111 mg/dL, a 49% reduction, while achieving a mitotane concentration of 13 mcg/mL using 4 g daily.
Conclusion: Utilizing a PCSK9 inhibitor, such as evolocumab, allows the dose of mitotane to be increased to achieve a therapeutic level while maintaining adequate control of cholesterol. With options for management of mitotane-induced hypercholesterolemia being limited, off-label use of a PCSK9 inhibitor can be justified clinically as moderate LDL-C reduction has also been shown in a prior published case report (1). Evolocumab is a well-tolerated subcutaneous injection, and should be considered for patients with resistant hypercholesterolemia while on mitotane.
References: (1) Tsakiridou ED, Liberopoulos E, Giotaki Z, et al. Proprotein convertase subtilisin-kexin type 9 (PCSK9) inhibitor use in the management of resistant hypercholesterolemia induced by mitotane treatment for adrenocortical cancer. *J Clin Lipidol*. 2018;12(3):826–829.

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Pregnancy in Familial Chylomicronemia Syndrome: Plasmapheresis as Therapeutic Approach

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Introduction: Familial Chylomicronemia Syndrome (FCS) is a rare autosomal recessive disease where functional loss of lipoprotein lipase results in severe hypertriglyceridemia. Patients often experience recurrent acute pancreatitis, a life-threatening disease. Serum triglycerides (TGs) are physiologically elevated several folds during pregnancy, which especially endanger patients with FCS to develop hypertriglyceridemic pancreatitis (HP) and complications like miscarriage. Despite the development of new drugs for FCS, their safety in pregnancy has not yet been confirmed and their treatment represents a big challenge.
Clinical Case: A 30-year women was hospitalized for planned reevaluation while 22 weeks pregnant. She was diagnosed with FCS at the age of one month with failure to thrive, jaundice and lipemic blood serum (homozygous for the LPL gene variation C.1019-2A>T). During childhood she was treated with low-fat diet with average TG levels 10–15 mmol/l (n<1,7 mmol/l). In the past five years, she was hospitalized for HP five times due to loss of compliance to diet (serum TGs > 30 mmol/l). The last episode of HP was provoked by pregnancy and resulted in miscarriage. At the admission, the patient was asymptomatic, with BMI:18,5 kg/m^2, TGs: 32,2 mmol/l (n<1,7 nmol/l), lipase: 21 U/L (n<60 U/L). Gynecology status and child growth parameters were normal. Due to inability to achieve lower TG levels plasmapheresis was started two times per week. The overall mean of pre plasmapheresis values of TGs were 21,68 nmol/l (ranging from 15,9 to 26,3 nmol/l) and post plasmapheresis were 7,15 mmol/L (ranging from 4,9 to 9,9 mmol/l). Due to the frequent need for plasmapheresis and high risk pregnancy, the patient was transferred to the Gynecology department. The patient had no adverse reactions and fetal monitoring was performed before, during and after procedure with no abnormalities registered. Plasmapheresis was performed using Spectra OPTIA via peripheral veins with 5% albumin replacement, proceeded by 250-500ml of 0.9% saline infusion. At 40th gestational week Cesarean section was performed and a healthy baby boy (weight: 3540 g, lenght: 49 cm) was born with Apgar score 10/10. We followed baby boy the first five years of the childhood. So far the patient has not experienced HP and the baby boy has normal levels of TGs.
Conclusion: Our case showed a succesfull pregnancy outcome in female patient with FCS achieved by multidisciplinary approach including plasmapheresis. For the first time therapeutic plasmaferesis was used in order to prevent pancreatitis and potential complications for both mother and child.

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Severe Hypercholesterolemia in Very-Low-Carbohydrate Diet

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