Sitosterolemia: A Rare Cause of Premature Coronary Artery Disease

Juliette K. Logan, MD, Todd C.Villines, MD

Department of Cardiology, University of Virginia, Charlottesville, VA

ABSTRACT

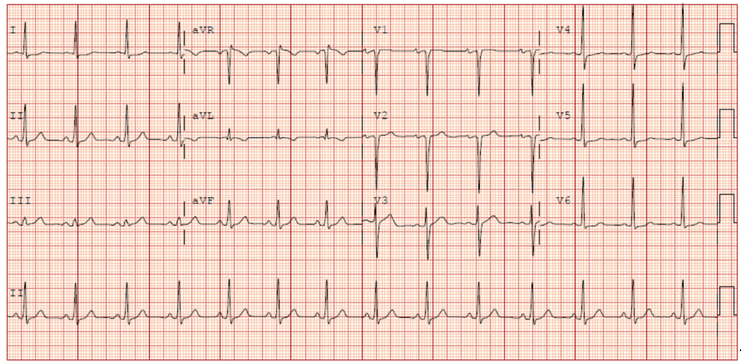
Sitosterolemia is an autosomal recessive disorder of lipid metabolism characterized by a net increase in plant sterol intestinal absorption via decreased biliary excretion. Clinical presentation is similar to familial hyperlipidemia but is much rarer with significant differences in management.

PATIENT PRESENTATION

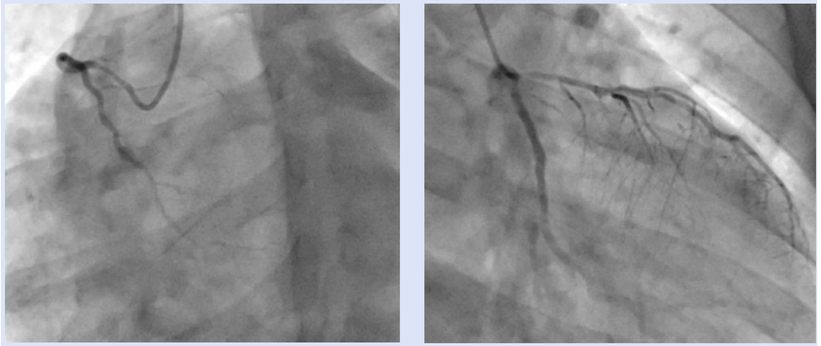
A 29-year-old vegan male law student presented with exertional chest pain associated with increased dyspnea on exertion.

Initial EKG demonstrated concern for anteroseptal infarct and Troponin I 2.4 mg/mL (normal <0.02 ng/mL). His exam was notable for xanthelasmas and small tendon xanthoma. Echocardiography demonstrated low normal systolic function with septal hypokinesis. Other labs notable for low-density lipoprotein 230 mg/dL, total cholesterol 290 mg/dL, triglycerides 75 mg/dL, and high-density lipoprotein 39 mg/dL. Invasive coronary angiography revealed multivessel disease (90% stenosis of left anterior descending, 70% stenosis of first diagonal, and severe diffuse right coronary artery disease). He subsequently underwent three vessel coronary artery bypass with LIMA-LAD, Radial-LAD, and RIMA-RCA.

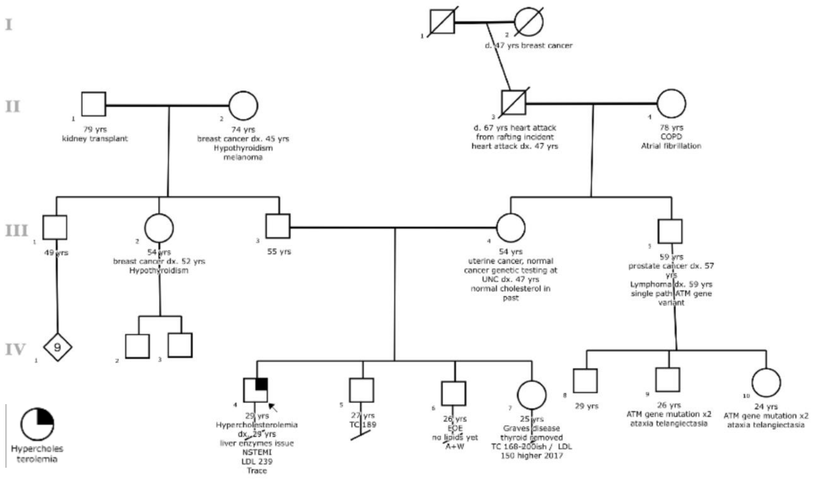
Genetic testing for familial hyperlipidemia and other congenital lipid abnormalities was sent that identified two pathogenic mutations in ABCG8, diagnostic of sitosterolemia. Sitosterol level was 365.4mg/L (normal <15mg/L). He was initiated on rosuvastatin and ezetimibe with significant improvement in his lipid profile with plans to start a bile-acid sequestrant. Given the genetic inheritance of the disease, his sister underwent genetic testing which was also diagnostic of sitosterolemia.



RESULTS

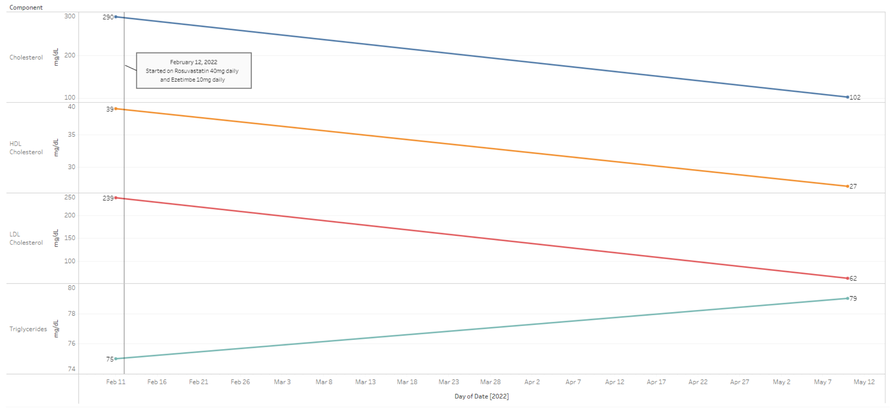


RCA LCX LAD



DECISION MAKING

Sitosterolemia is a rare genetic disorder of lipid metabolism that presents with premature coronary atherosclerosis and xanthomas. Symptoms may also be vague and include joint pain and stiffness. Diagnostic criteria is comprised of four categories: clinical manifestations, serum sitosterol levels, exclusion of FH, and cerebroteinous xanthomatosis, and pathogenic mutations. Definitive diagnosis must include pathogenic mutations in ABCG8 or ABCG5. Once the diagnosis is established, first line management is dietary restriction of sterol rich foods, traditionally considered beneficial in familial hyperlipidemia. Recommended medications are ezetimibe and bile-acid sequestrants. Statin therapy may be beneficial although sitosterolemia patients often have a blunted response due to significant down-regulation of LDL biosynthesis mechanisms.



CONCLUSIONS

This case illustrates an unusual presentation of severe coronary artery disease in a young patient without prior family history. Sitosterolemia is a rare cause of premature atherosclerosis that must be accurately diagnosed through appropriate genetic testing and cascade family testing. The importance of accurate and timely diagnosis is crucial given its unique management considerations, which focus on major diet and lifestyle modifications.

***Author Contact**: jkl9cv@hscmail.mcc.virginia.edu*