Clinical Case Study

A Patient with Primary Biliary Cirrhosis and Elevated LDL Cholesterol

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CASE DESCRIPTION

A 47-year-old woman was referred to us for follow-up of primary biliary cirrhosis (PBC). She reported nausea, malaise, weight loss, and new-onset jaundice. The patient had recently had an episode of melena with anemia requiring blood transfusions, but upper endoscopy and colonoscopy did not reveal a bleeding source. She reported a smoking history of 30 years and was currently smoking. The patient's family history included rheumatoid arthritis, hyperlipidemia, and cardiovascular disease. Her medical history included fibromyalgia and treated Hashimoto thyroiditis.

A diagnosis of PBC had been made elsewhere 5 years previously on the basis of positive antimitochondrial antibody and liver biopsy findings showing stage 1 PBC. The patient was started on ursodeoxycholic acid, but she did not tolerate this medication. Four years later, she remained unable to tolerate ursodeoxycholic acid and was referred to our clinic.

When the case patient presented to our clinic 1 year ago her laboratory studies showed alkaline phosphatase 1416 U/L, aspartate aminotransferase 120 U/L, alanine aminotransferase 81 U/L, total bilirubin 18.9 μmol/L (1.1 mg/dL), direct bilirubin 10.3 μmol/L (0.6 mg/dL), albumin 35 g/L (3.5 g/dL), total cholesterol 17.2 mmol/L (665 mg/dL), triglycerides 2.01 mmol/L (178 mg/dL), HDL cholesterol (HDL-C) 0.67 mmol/L (26 mg/dL), and calculated LDL-C 15.6 mmol/L (603 mg/dL). Ursodeoxycholic acid treatment was recommended, and the patient's lipids were to be rechecked in 3 months. The patient returned 1 year later, off medication, after the episode of gastrointestinal bleeding. Physical examination showed scleral icterus, jaundice, and sclerodactyly, as well as a palpable liver 2 cm below the costal margin and multiple firm, whitish dermal papules on her left forearm. The most recent laboratory results are shown in Table 1. Computed tomographic enterography of her abdomen was negative for a bleeding source in the small bowel. In addition, extensive atherosclerotic disease, especially in the aortoiliac vasculature, and focal ectasia in the distal right common iliac artery were noted. Because of the patient's high LDL-C concentration and family history of atherosclerosis, she was referred for a cardiology evaluation.

Questions to Consider
• What is the differential diagnosis for a hypercholesterolemia which shows markedly increased LDL-C and decreased HDL-C?
• What lipid/lipoprotein abnormality occurs in patients with cholestatic disorders such as primary biliary cirrhosis?
• What approaches would be useful to confirm the nature of lipid/lipoprotein abnormalities observed in patients with cholestatic liver disease, and how can accurate LDL-C and HDL-C concentrations be determined in patients with primary biliary cirrhosis and resulting lipoprotein abnormalities?

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Table 1. Patient laboratory results.

Most recent laboratory results		Reference interval
Alkaline phosphatase	1328 U/L	39–100 U/L
Aspartate aminotransferase	122 U/L	8–43 U/L
Alanine aminotransferase	80 U/L	7–45 U/L
Total bilirubin	3.0 mg/dL	0.1–1.0 mg/dL
Direct bilirubin	1.9 mg/dL	0.0–0.3 mg/dL
Albumin	2.6 g/dL	3.5–5.0 g/dL
Total-C	1060 mg/dL	<200 mg/dL (optimal)
Triglycerides	169 mg/dL	<150 mg/dL (optimal)
HDL-C (Roche)	24 mg/dL	40–60 mg/dL
LDL-C (calculated)	1002 mg/dL	<100 mg/dL (optimal)
ApoB	247 mg/dL	44–148 mg/dL
Lipid measurements with ultracentrifugation method		
Total-C	1060 mg/dL	<200 mg/dL (optimal)
Triglycerides	169 mg/dL	<150 mg/dL (optimal)
HDL-C (ultracentrifuge)	201 mg/dL	40–60 mg/dL
LDL-C (ultracentrifuge)	740 mg/dL	<100 mg/dL (optimal)
VLDL-C	119 mg/dL	<15 mg/dL (optimal)

Final Publication and Comments

The final published version with discussion and comments from the experts will appear in the January 2009 issue of *Clinical Chemistry*. To view the case and comments online, go to http://www.clinchem.org/content/vol55/issue1 and follow the link to the Clinical Case Study and Commentaries.

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