Method to estimate LDL-C may provide more accurate risk classification

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Seth S. Martin, M.D., of the Johns Hopkins Ciccarone Center for the Prevention of Heart Disease, Baltimore, and colleagues developed a method for estimating low-density lipoprotein cholesterol (LDL-C) levels that is more accurate than the standard measure.

Low-density lipoprotein cholesterol is the primary target for treatment in national and international clinical practice guidelines. Conventionally, LDL-C is estimated by the Friedewald equation, which estimates LDL-C as (total cholesterol) - (high-density lipoprotein cholesterol [HDL-C]) - (triglycerides/5) in mg/dL. The final term assumes a fixed ratio of triglyceride levels to very low-density lipoprotein cholesterol (TG:VLDL-C) of 5:1. "Applying a factor of 5 to every individual patient is problematic given variance in the TG:VLDL-C ratio across the range of triglyceride and non-HDL-C levels," according to background information in the study.

The researchers used a sample of lipid profiles obtained from 2009 through 2011 from 1,350,908 children, adolescents, and adults in the United States.

From this large sample of lipid profiles, the authors created and validated a novel method to estimate LDL-C from the standard lipid profile, consisting of a 180-cell table (grid) of median TG:VLDL-C values based on triglyceride and non-HDL-C values. Rather than assuming a fixed factor of 5, it applies an adjustable factor for the TG:VLDL-C ratio based on triglyceride and non-HDL-C concentrations.

"The greatest advantage occurs in classification of LDL-C concentrations lower than 70 mg/dL, especially in patients with elevated triglyceride concentrations. In addition to the novel analytic approach, a major strength of this study is its size, 3,015 times larger than the original Friedewald database."

"These findings require external validation, as well as assessment of their clinical importance. The novel method could be easily implemented in most laboratory reporting systems at virtually no cost."

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