Lipid Screening in Children and Adolescents—A Missed Opportunity to Improve Lifelong Health

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Atherosclerotic cardiovascular disease is the number one cause of death in adults in high-income countries. As shown in multiple lines of research, the atherosclerotic process can begin in childhood and progress throughout childhood, adolescence, and early adulthood, resulting in major cardiovascular adverse events later in life. From a clinical perspective, the atherosclerotic process is asymptomatic. The first clinical manifestation may be a myocardial infarction, stroke, or sudden death. The Framingham Study and other studies of adult populations have identified major risk factors for atherosclerosis, including dyslipidemia (primarily elevated low-density lipoprotein [LDL] cholesterol), hypertension, diabetes, cigarette smoking, and obesity. The Bogalusa Study and other studies of pediatric populations have demonstrated that these risk factors are present in children and adolescents and are associated with progression of atherosclerotic lesions and, ultimately, major adverse cardiovascular events. Because effective lifestyle and pharmacologic treatments are available to lower LDL cholesterol, identifying children with dyslipidemia and instituting appropriate treatment is likely to prevent or delay the adverse cardiovascular events resulting from atherosclerosis. Indeed, national organizations, such as the American Academy of Pediatrics, the American Heart Association, and the National Heart, Lung, and Blood Institute have all recommended universal screening for dyslipidemia in the pediatric population.

Elsewhere in JAMA Network Open, Thompson-Paul et al. report on the frequency of lipid screening in pediatric primary care using a large electronic medical record database from the United States. The database included patients aged 9 to 21 years with at least 1 valid measure of height and weight from 2018 to 2021. They found that the prevalence of recommended lipid screening was low, at approximately 11%. They also found that the prevalence of lipid screening increased by age group and by category of body mass index, with the highest prevalence (22%) in patients with severe obesity.

Why has the uptake of lipid screening recommendations been so low? It is often true that implementation of recommendations in actual clinical practice is a slow process. However, for lipid screening, it may also be true that the rationale for screening has been unclear for clinicians in pediatric primary care. The pediatric recommendations have often seemed to be merely an extension of adult-focused recommendations, which may be confusing for those in pediatric practice. It is also likely that prevention of cardiovascular disease that occurs in adulthood is not top of mind for pediatric clinicians. While there is some overlap with lipid screening in adults, there are also important differences in the rationale for pediatric lipid screening. There are 3 main reasons to implement lipid screening in the pediatric population. The first, and most important, is to identify children with genetic dyslipidemias, such as familial hypercholesterolemia (FH). Heterozygous FH is present in 1 of 250 individuals and results in severe elevation of LDL cholesterol. Heterozygous FH is associated with substantial increased risk of premature atherosclerotic cardiovascular disease as a result of lifetime exposure to high concentrations of circulating atherogenic lipid particles. The concentration of circulating atherogenic particles can be lowered with pharmacologic treatment. The second reason pediatric screening is useful is to identify other family members with FH, using the child as the index case. This is often referred to as reverse cascade screening and can identify parents and grandparents who may be unaware of their dyslipidemia and are at more proximate risk of an adverse cardiovascular event. The third reason for pediatric lipid screening is to identify the
dyslipidemias associated with lifestyle. This form of dyslipidemia is most likely to include high triglyceride levels and low high-density lipoprotein cholesterol and is sometimes related to obesity. The appropriate treatment for this form of dyslipidemia is the implementation of lifestyle changes in diet and physical activity.

The results of Thompson-Paul et al\(^7\) indicate that lipid screening in children is more likely to occur in the presence of obesity, with the highest prevalence in those with obesity (14.7\%) and severe obesity (21.9\%).\(^7\) These results reflect the common misperception among the lay public and primary care clinicians that the most important lipid abnormalities are a result of increased adiposity. In fact, the most severe lipid abnormalities result from genetic dyslipidemias, such as FH, which are not usually associated with obesity. This misconception is unfortunate because focused screening in children and adolescents with obesity is likely to miss those with FH who are at the highest lifetime risk of major adverse cardiovascular events. This risk, once identified, can be reduced with effective treatment to lower LDL cholesterol starting around age 10 years.\(^10\) The results of the study by Thompson-Paul et al\(^7\) emphasize that a broader understanding of the rationale for pediatric lipid screening is needed to increase the prevalence of screening in practice and to improve the ability to prevent atherosclerotic cardiovascular events.

**REFERENCES**


