

## When should we screen children for hyperlipidemia?

### EVIDENCE-BASED ANSWER

Children should be screened for hyperlipidemia when there is a history of familial hypercholesterolemia (strength of recommendation [SOR]: **C**).

No clear evidence supports screening all children or just those with family history of cardiovascular disease (CVD) or hyperlipidemia (SOR: **C**).

### CLINICAL COMMENTARY

#### With no clear medical treatment for childhood dyslipidemia, screening provides little help

There is no clear evidence to support screening children with or without familial hypercholesterolemia for hypercholesterolemia. In an era where judicious use of medical dollars is a must, screening for hypercholesterolemia would also be cost-prohibitive. Other than stressing exercise and nutrition, there is no clear medical treatment that is FDA-approved for dyslipidemia among children, so screening would provide very little help in the management of this population.

Patients with a strong family history of lipid disorders or familial hypercholes-

terolemia should have more directed education on cholesterol and their need to treat in early adulthood; however, at this time there is very little evidence to support screening in this population. Aggressive promotion of age-appropriate exercise and a healthy lifestyle should be the thrust of our intervention until more evidence-based information shows that screening and treatment improves morbidity and mortality.

This Clinical Inquiry emphasizes the need to do more research in pediatric hypercholesterolemia, to better counsel our patients not only in screening but ultimately in earlier medical intervention.

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### Evidence summary

Screening for hyperlipidemia using total cholesterol and low-density lipoprotein (LDL) cholesterol is recommended for adults after the age of 35 years for men and 45 years for women.<sup>1</sup> Younger adults (men aged 20–35 and women aged 20–45) should be screened for lipid disorders if they have other risk factors for CVD.<sup>1</sup>

Children with heterozygous familial hypercholesterolemia, an autosomal dominant disorder with a prevalence of 1 in 500, are at increased risk of cardiovascular morbidity and mortality in adulthood. One quarter of males with familial hypercholesterolemia suffer fatal coronary heart disease (CHD) by age 50 years.<sup>2</sup>

The use of statins by children with

**FAST TRACK****Children with a family history of lipid disorders should have more directed education on cholesterol, but little evidence supports screening this population**

familial hypercholesterolemia for up to 2 years is safe and lowers LDL cholesterol.<sup>3</sup> Longer use by children has not been studied, so no comment can be made about long-term safety and decreased CHD morbidity and mortality.

One systematic review and cost-effectiveness analysis investigated the appropriateness and cost-effectiveness of screening methods for familial hypercholesterolemia beginning at the age of 16 years.<sup>4</sup> The authors identified potential screening strategies from 6 cross-sectional studies and applied these to a decision analysis. Screening of first-degree relatives of those with familial hypercholesterolemia was most effective in detecting cases of familial hypercholesterolemia (number needed to screen [NNS] = 3; cost per case detected = \$232; cost per life-year gained = \$5397).

Universal screening of all 16-year-olds was also cost-effective (cost per life-year gained = \$4839), but resulted in a much larger NNS and cost of detection (NNS=1365, cost per case detected = \$16,999). The authors concluded that case finding through screening of first-degree relatives was the most cost-effective strategy overall.

In contrast to children affected with familial hypercholesterolemia, the relationship of blood cholesterol levels in children without familial hypercholesterolemia to CHD later in life has not been established. A paucity of data exists that links lowering of cholesterol in childhood with reduced CHD morbidity and mortality in adulthood. Therefore, the benefits of detecting and treating childhood hyperlipidemia without familial hypercholesterolemia are not known. Despite the lack of patient-oriented outcomes research in this area, 2 guidelines recommend screening all children for hyperlipidemia.<sup>5,9</sup>

Three studies investigated the use of various recommended screening indicators in identifying children with hyperlipidemia. The first was a control cohort from a case-control study that applied the National Cholesterol Education Program (NCEP) guidelines for screening in chil-

dren<sup>5</sup> to 501 US males less than 20 years old, and examined the effectiveness of using the recommended 2 major screening indicators (family history of premature cardiovascular disease and parent cholesterol >240 mg/dL) plus 5 discretionary indicators (high-fat/high-cholesterol diet, hypertension, obesity, smoker, steroid/medication).<sup>6</sup> If all major and discretionary indicators were applied to the cohort, 96% of the children with LDL greater than 130 mg/dL were identified. However, the individual positive predictive values (PPV; probability of having LDL >130 when a child had a screening indicator) ranged from 6.8% to 20.6%.

The 2 other studies used a cross-sectional design to evaluate family history of premature cardiovascular disease and hyperlipidemia screening indicators in 4183 grade-school children in Taiwan<sup>7</sup> and 2217 youths in Quebec.<sup>8</sup> Family history performed poorly as a mechanism for identifying children with hypercholesterolemia (total cholesterol >200 mg/dL; LDL >130 mg/dL) (PPV <12.5%<sup>7</sup>, PPV=7.7%<sup>8</sup>). More than 75% of the children in the Taiwan study would have been missed using family history as a screen. Both studies concluded that family history as a screening indicator is insensitive and inaccurate, and no more useful than general population screening.

**Recommendations from others**

Neither the American Academy of Family Physicians or the US Preventive Services Task Force makes a recommendation about screening for hyperlipidemia in this age group.

The American Academy of Pediatrics recommends screening children aged 2 years or older whose parents or grandparents had coronary atherosclerosis at age 55 or younger (defined by diagnostic coronary arteriography, myocardial infarction, angina pectoris, peripheral vascular disease, cerebrovascular disease, or sudden cardiac death). They also advocate screening children of a parent with an elevated blood cholesterol level (total cholesterol

240 mg/dL or higher) and those whose parental history is unobtainable.<sup>9</sup>

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