

RESEARCH LETTER

A Novel Approach Using an Electronic Medical Record to Identify Children and Adolescents at Risk for Dyslipidemia: A Study from the Primary Care Education and Research Learning (PEARL) Network

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Purpose: We conducted a retrospective analysis to identify children and adolescents in the Primary Care Education and Research Learning practice-based research network (PBRN) who were at risk for dyslipidemia.

Methods: Using coding data from an electronic medical record to identify all adults with an underlying diagnosis of hyperlipidemia enrolled to this PBRN, children at risk for dyslipidemia were identified.

Results: Enrolled to this network were 189,282 patients, including 55,252 children aged 2 to 18 years. The prevalence of physician-coded hyperlipidemia in the adult population was 1.5%. Two percent of the children enrolled to this PBRN were at risk for dyslipidemia.

Conclusion: Using technology within electronic medical records allowed for the identification of children at risk for dyslipidemia and to create clinical reminders that will allow us to improve the efficiency of screening efforts. (J Am Board Fam Med 2008;21:356–357.)

Hyperlipidemia is a primary risk factor for cardiovascular disease. Although children rarely manifest end-organ disease from hyperlipidemia, epidemiologic evidence^{1,2} suggests that elevated lipid levels in childhood predict a higher likelihood of cardiovascular disease in adulthood.

A recent Agency for Health Care Research and Quality evidence review of childhood dyslipidemia advocates the development of new screening strategies that are more effective than those currently in practice.³ Early identification of dyslipidemia in childhood is an attractive primary preventive approach to atherosclerosis. Such intervention can

only occur if at-risk children are appropriately identified.

Methods

The Primary Care Education and Research Learning (PEARL) Network was used for this study. This network is composed of multiple independent military treatment facilities across the United States. With an enrolled population of more than 189,000 patients, the network is connected by a sole-source electronic medical record (EMR) called the Armed Forces Health Longitudinal Technology Application (AHLTA). All patient encounters, including International Classification of Diseases coding data, are captured and centrally stored within this EMR.

After institutional review board approval and information systems security clearance, we used a central data reporting tool to coordinate database queries linked to AHLTA. To determine the number of children at risk for dyslipidemia, we first identified all enrolled adults between the ages of 19 and 64 with the diagnosis of hyperlipidemia (International Classification of Diseases-9, series 272.xx). Using a unique family member prefix code, we were then able to identify children whose parents

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Table 1. Hyperlipidemia Within the Primary Care Education and Research Learning Network

Patients enrolled to the PEARL Network (n)	189,282
Children (aged 2–18) enrolled to the PEARL Network (n)	55,252
Adults with 272.xx ICD-9 code for hyperlipidemia (n [%])	2,820 (1.5)
Children of these patients who are at risk for dyslipidemia (n [%])	1,086(2)

PEARL, Primary Care Education and Research Learning; ICD, International Classification of Diseases.

carried a diagnosis of hyperlipidemia. Data were saved on a password-protected secure server and imported to SPSS software (version 14.0; SPSS, Inc., Chicago, IL) for statistical analysis. Basic descriptive statistics and χ^2 testing were used for group comparisons.

Results

Overall, 189,282 patients are enrolled to the PEARL network. This includes 58,974 patients enrolled to tertiary care facilities; 103,146 enrolled to community-based hospitals; and 27,162 patients enrolled to community-based clinics. Of the enrolled patients, 55,252 were between the ages of 2 and 18. A total of 2820 adult patients with hyperlipidemia were identified. These patients were parents to 1086 children. The percentage of children aged 2 to 18 years within our network and at risk for dyslipidemia was 2% (Table 1). Adults diagnosed with hyperlipidemia were more likely to have diabetes ($P < .01$), hypertension ($P < .01$), and atherosclerotic coronary artery disease ($P < .01$) than were normolipemic peers.

Discussion

This study adds to the growing body of literature about pediatric dyslipidemia. Using existing provider-level data, we were able to easily determine the prevalence of coded hyperlipidemia within the network's adult population. We used this "real world" coding data to identify a specific population of at-risk children. Once the data syntax was established, determining which children were at risk for hyperlipidemia took only seconds. The prevalence of coded hyperlipidemia was much lower than existing population estimates for adult hyperlipid-

emia (18%).⁴ In addition, our estimates of at-risk children are lower than those from previous studies.⁵ This raises an important question about the accuracy of provider-based coding within this PBRN.

There are limitations to this study. Data mining tools did not allow racial or ethnic differences to be analyzed. In addition, measured serum cholesterol levels or pharmacy-level prescription data was not able to be correlated with provider diagnoses of hyperlipidemia.

Although the best way to identify children at risk for dyslipidemia remains controversial, we were able to quickly and efficiently identify a significant population of children at risk for dyslipidemia. We have used this data to redesign an automatic prompting system embedded within the EMR to offer real-time screening for childhood dyslipidemia. Specifically, by linking a parental diagnosis of hyperlipidemia, with the child's body mass index, we aim to capture children at highest risk for dyslipidemia within the workflow of the clinical encounter.

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