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AHA Statement on Cardiovascular Monitoring in Children Who Receive Stimulants

The AHA's recommendation for ECG screening in children and adolescents who take stimulant medication is premature.

The American Heart Association (AHA) released a statement on cardiovascular monitoring in children and adolescents who receive stimulant medication in which it supports electrocardiogram (ECG) monitoring as part of the evaluation. The statement is based on data from studies of various aspects of child health, including causes of sudden cardiac death (SCD) and ECG screening programs to detect underlying cardiac disease. Highlights of the report include:

> About 2.5 million children in the U.S. are prescribed stimulants for ADHD.
> From 1999 through 2003, 19 sudden deaths and 26 cardiovascular events were reported in children aged 18 years and younger who received ADHD medications.
> SCD occurs in 1000 to 7000 U.S. children annually: Causes include hypertrophic cardiomyopathy (33%–50%), long-QT syndrome (15%–25%), coronary artery anomalies (10%–20%), primary ventricular fibrillation (10%–15%), and Wolff-Parkinson-White syndrome (3%–5%).
> The prevalence of hypertrophic cardiomyopathy in the U.S. is about 1 in 500; 75% to 95% of patients have abnormal ECGs.
> Among patients with long-QT syndrome, 90% have ECG abnormalities, and 4000 cases annually lead to SCD (mostly in adults).
> The prevalence of Wolff-Parkinson-White syndrome pattern on ECG is 1 to 3 per 1000. Diagnosis is based on ECG findings.
> Studies from Japan, Italy, and the U.S. (Nevada) in newborns, children, and adolescents suggest that ECGs are superior to physical examination and history for detecting underlying causes of SCD.
> Stimulants are known to increase heart rate (by 1–2 beats/minute) and systolic and diastolic blood pressure (3–4 mm Hg).
> The AHA states that in addition to patient and family histories (including questions about sudden death, hypertrophic cardiomyopathy, long-QT syndrome, etc.) and physical examination (evaluation for hypertension, abnormal heart murmur, Marfan syndrome), "A baseline ECG, which often can identify cardiovascular abnormalities . . . is reasonable to obtain." The AHA recommends that ECGs be read by cardiologists with expertise in reading pediatric ECGs.

Comment: Recently revised AHA recommendations regarding preparticipation cardiovascular screening in athletes (Journal Watch Pediatrics and Adolescent Medicine Dec 19 2007 (Link to: http://pediatrics.jwatch.org/cgi/content/full/2007/1219/3)) do not support obtaining ECGs for children and adolescents before they engage in competitive sports. Yet, based on nearly the same data, the AHA now states that ECGs might be warranted in children and adolescents who are currently taking or about to start taking stimulants. This recommendation contrasts with the position of the AAP, whose guideline does not contain specific recommendations about performing screening ECGs before treatment with stimulants.

The AHA report is not based on strong clinical or research evidence. The fact that stimulant medication minimally increases heart rate and blood pressure does not imply that stimulants are responsible for SCD, even

in the presence of a cardiac lesion. In a 2006 preliminary report on the safety of stimulant medications (Journal Watch Pediatrics and Adolescent Medicine Apr 7 2006 (Link to: http://pediatrics.jwatch.org/cgi/content/full/2006/407/1)), the FDA noted that the number of cases of SCD reported from 1999 through 2003 in children younger than 18 years who received stimulants was not higher than the expected rate in the general population and, therefore, is insufficient evidence to make a causative association.

The AHA report includes the following: "We recognize that there are no clinical trials to inform us on this topic. . .. It is not known if the risk of SCD on stimulants is higher than in the general population or that the approach described will decrease the risk." The authors recommend further study and a national SCD registry. Until more data are available, pediatricians who treat children and adolescents with ADHD with stimulant medication should continue to rely on cardiac history (personal and familial, including sudden deaths) and physical exam.

— Howard Bauchner, MD (Link to: http://pediatrics.jwatch.org/misc/board_about.dtl#aBauchner) , and Martin T. Stein, MD (Link to: http://pediatrics.jwatch.org/misc/board_about.dtl#aStein)

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