Preventing sudden death in athletes

The August issue of AAP News contained an important article on sudden death in athletes. I take issue with a number of the points raised by Dr. Washington in this article on preparticipation exams for competitive athletics.

First, the number of deaths is closer to 1 in 20,000 athletes, not 1 in 200,000 as stated.

Secondly, he does not give enough weight to the use of routine electrocardiograms (EKGs). These can detect the Wolff-Parkinson-White syndrome, prolonged QTc syndrome, as well as a number of arrhythmias. The EKG also can sometimes suggest hypertrophic cardiomyopathies when there are deep Q waves in the left precordial leads. I recommend that an EKG be done yearly on all athletes involved in the more strenuous sports.

According to Arthur Garson Jr., “Of the primary cardiovascular abnormalities associated with sudden death, all but one are characterized by abnormalities on the routine electrocardiogram (the exception is anomalous coronary artery, in which symptoms often develop during exercise).” (Garson A. “Sudden Death in the Young,” Hospital Practice, June 15, 1991, pp. 51-60.)

Dr. Washington also questions the routine use of echocardiograms because of the cost. But it should be noted that the Veneto region of Italy has been doing ECGs and echocardiograms for more than 20 years. As a result, they have sharply reduced deaths among competitive athletes (Corrado D, et al. N Engl J Med. 1998;339:364-369).

I wonder how much we would be prepared to pay if these were our children or grandchildren who were involved.

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Response from Reginald L. Washington, M.D., FAAP:

In a large evidence-based study evaluating the prevalence of sudden cardiac death during competitive sports activities in high school athletes by Maron, the risk of sudden cardiac death is 1:200,000 per year (J Am Coll Cardiol. 1998;32:1881-1884).

The 12-lead ECG has been proposed several times as a practical and cost-effective screening tool for athletes. The low specificity of this test specifically limits its utility for widespread screening. One study evaluated EKGs in 501 college athletes, and no athlete was excluded based on the ECG alone (Maron BJ, et al. J Am Coll Cardiol. 1987;10:1214-1211).

Similarly, limited echocardiography has been suggested as a screening modality in athletes. An important limitation to the utility of echocardiography is cost. Most studies published in the literature are dependent on volunteer time and equipment and are, therefore, not generalizable. Mass screening has an estimated cost of $600 per athlete. Therefore, in the United States, screening could cost over $250,000 for each new case of hypertrophic cardiomyopathy identified and over $100 million for each life saved (Circulation. 1996;94:850-856).

The Veneto region of Italy has a well-described familial hypertrophic cardiomyopathy that is unique to that part of the world. Because of that, the federal government of Italy not only requires ECGs and echocardiograms before athletic participation, but it also pays for these studies to be completed. The incidence of hypertrophic cardiomyopathy in this region far exceeds that of any other location in the world.

If ECGs and echocardiograms were to be required for mass screening, details such as who will provide these studies, how quality will be controlled and assured, and how these studies will be paid for must all be addressed. Would there be two standards of care — one in a community where pediatric cardiologists and appropriate equipment are readily available and a second standard of care for rural United States or the inner cities where pediatric cardiologists, equipment and money are not readily available?

For all the above reasons, the American Academy of Pediatrics and the American Heart Association do not recommend the routine use of ECGs or echocardiograms for mass preparticipation screening. On the other hand, if a thorough history and physical examination suggest an underlying cardiovascular abnormality, then these studies are more than appropriate.