Editorial

How should we screen competitive athletes for cardiovascular disease?

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This editorial refers to 'Cardiovascular pre-participation screening of young competitive athletes for prevention of sudden death: proposal for a common European protocol'† by D. Corrado et al., on page 516

The sudden unexpected deaths of young trained athletes are highly visible events which have a substantial impact on the physician and lay communities.1 Although initially a focal point in the United States in the early 1980s, this issue has now become a matter of concern in most parts of the industrialized world (particularly in Europe). Evidence of this is the highly publicized recent sudden deaths of several elite professional athletes from Europe, South America, and Africa, including Sergio Serginho (Brazil; football), Sergei Zholtok (Latvia; hockey), Marc-Vivian Foe (Cameroon; football), Sergei Grinkov (Russia; skating), Miklos Feher (Hungary; football), Cristiano de Lima, Jr (Brazil; football), and Trevor Borysuk (Canada; hockey), at least one of whom had a cardiac diagnosis made previously.

Interest in athletic field deaths has also accelerated because of the recognition that these catastrophic events are probably more common than previously thought, may occur in athletes of both genders and all races including under-served minorities, and that the responsible (but usually clinically unsuspected) structural cardiovascular diseases may be clinically identifiable.1–8 At this juncture, the large number of cardiac diseases that can pre-dispose athletes to lethal ventricular tachyarrhythmias have been well documented in a number of autopsy-based studies, largely from the United States and Italy.1,2 Although the specific cardiac diseases cited in these studies are the same, the frequency with which they are associated with sudden death differs considerably—i.e. most commonly hypertrophic cardiomyopathy (HCM) in the United States and arrhythogenic right ventricular cardiomyopathy in Italy.

With this knowledge of the culprit diseases, attention is shifting toward potentially preventive strategies such as formalized, large population pre-participation screening.4–8 The basic intent of such mass screening programs is to identify and withdraw from training and competition (either temporarily or permanently) those athletes perceived to be at risk in an effort to reduce the likelihood for sudden cardiac death, and to allow for preventive treatment interventions if appropriate.3 By its very nature, pre-participation screening aspires to the identification of particularly uncommon cardiovascular diseases with low event rates in large general populations.4,5

The precise methodology by which pre-participation screening should be (or can be) performed has been the source of considerable debate and even controversy.9,10,14 Therefore, the proposal for a common European protocol by which such screening can be carried out, appearing in Corrado et al.,6 represents a welcome and important idea which has the potential to identify previously unrecognized but lethal cardiovascular diseases and reduce the risks of the athletic field for many young athletes.

The European Society of Cardiology Consensus Statement6 constitutes the view of representatives from eight Western European countries that pre-participation screening best serves athletes if performed systematically and comprises a thorough personal and family history and physical examination, as well as a standard 12-lead electrocardiogram (ECG). This initiative is formulated to increase awareness and interest in this clinical problem within the European community. The proposed strategy derives from the experience in Italy with a unique, mandatory, and government-sponsored system of medical evaluations in which six million athletes participating in organized sports (~10% of the Italian...
populations) are screened annually by specially trained and certified sports medicine physicians. This Italian initiative has derived numerous benefits for athletes, including recognition of the additive diagnostic power of the ECG in raising the suspicion of certain cardiac diseases (particularly HCM). Similar results have also been achieved in large populations of young military recruits in Italy using the same protocol with an ECG.

Extending this Italian programme to other European countries would certainly be a laudable enterprise, for it has the potential to save young lives. Nevertheless, the central challenge is one of practicality, feasibility, and implementation—with the primary potential obstacle being adequate resources and economic support. Indeed, the pre-participation screening process is much more complex than may be perceived at first glance, considering the manpower required on a permanent basis as well as the substantial burden potentially placed on the system by borderline test results. These issues are particularly relevant, given the diverse cultures and perspectives and competing medical and non-medical priorities that already exist in those societies which have participated in formulating the present document, as well as the 36 other European countries not currently directly part of this initiative. This is the principal issue for challenge to creating systematic national programs (that do not already exist)—i.e. assembling a preventive health initiative, such as pre-participation screening, preferentially for only one elite segment of the population.

Similar issues are relevant to the United States where (as Corrado et al. have pointed out), customary practice for pre-participation screening in populations of high school and college athletes has customarily included only a history and physical examination, and without ECG or other non-invasive tests. It is highly unlikely that in a country the size of the United States (population 284 million people), including perhaps as many as 12–15 million geographically dispersed participants in some form of competitive athletics, that such an expensive program—however benevolent and admirable—could become a top priority and be created de novo as a federal mandate. There are simply too many competing healthcare priorities and special interests and anticipated difficulties in cost control, as well as heightened concerns for medical–legal liability, to warrant serious consideration for such an undertaking in the United States.

In 1996, an American Heart Association (AHA) expert consensus panel recommended pre-participation screening to competitive athletes limited to the personal and family history and physical examination; routine diagnostic tests, including the ECG, were excluded largely based on cost-efficacy considerations. The panel recognized that these recommendations may not necessarily be relevant to other societies and were compelled only to offer guidelines consistent with the reality of pre-participation screening in the United States. On the other hand, the AHA consensus panel preferred to promote a standardized national medical examination form in accord with AHA recommendations to improve the existing system of history and physical examination screening and promote the identification of greater numbers of athletes with important cardiovascular abnormalities. Certainly, there is considerable margin for improvement in terms of both the current questionnaire forms and expertise of the examiners. While there can be little question that adopting a screening strategy including the 12-lead ECG in the United States would be superior to the present system, it could also be expected to be fraught with the major limitation of many false positive test results and re-evaluations which would negatively impact available resources and increase the psychological burden on the athletes, families, coaches, and institutions. Therefore, although the European screening initiative, now also promoted by the International Olympic Committee, is a powerful idea and strategy, it is unlikely to be exported to the United States.

In conclusion, the cardiovascular pre-participation screening proposal for young competitive athletes in Europe with the ECG is highly laudable, has the potential to save young lives, and is certainly deserving of our interest and consideration. As the author’s acknowledge, the principal challenge will be in overcoming the numerous obstacles to implementation, such as socioeconomic and cultural factors and the diverse structures of the national health systems in European countries other than Italy—where such an effective pre-participation screening system has been in place for almost 25 years. For those of us with a particular interest in the safety of the athletic field, we can only encourage Corrado et al. to overcome these obstacles in promoting this new concept in public health reform to which the European community aspires.

References


