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Cardiology Articles

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Abnormal ECG in athletes may be sinister sign

An abnormal electrocardiogram (ECG) in a young, highly trained athlete might be the first expression of underlying cardiomyopathy.

Previously, abnormal ECGs in young, highly trained athletes were thought to be the expression of underlying cardiomyopathy. However, a new study published in the *New England Journal of Medicine* suggests that this may be the first sign of a cardiomyopathy. And because underlying cardiomyopathy may cause illhealth, athletes with abnormal ECGs should be monitored.

The investigators in the study state that 12-lead ECGs often show a range of alterations in young athletes that suggest left ventricular hypertrophy, usually thought to be the result of training. But, a small group of athletes without underlying structural changes in their hearts may have "diffusely and deeply inverted T waves, suggestive of an underlying cardiac disorder."

In Italy, where the research was carried out, ECG screening of athletes is legally required to rule out cardiovascular disease. This allowed the Italian researchers to look at the clinical outcomes in athletes who had abnormal ECGs - particularly these distinctive repolarisation patterns. In a database of more than 12 000 athletes, there were 81 with repolarisation abnormalities who had no other signs of cardiovascular disease. Of these 81, five later proved to have cardiomyopathies, including an individual who died at the age of 24 from undetected arrhythmogenic right ventricular hypertrophy. The clinical and phenotypic features of hypertrophic cardiomyopathy developed in three athletes after about 12 years, and one had an aborted cardiac arrest. The fifth athlete had dilated cardiomyopathy after nine years of follow-up. Comparisons between 229 matched control athletes with normal ECGs from the same database revealed that none of those athletes had a cardiac event or were diagnosed with cardiomyopathy more than nine years after their initial evaluation.

"These observations underscore the importance of greater diagnostic scrutiny and continued clinical surveillance of trained athletes who present with such distinctly abnormal ECGs," write the authors.

Pelliccia A, Di Paolo FM, Quattrini FM, et al. Outcomes in athletes with marked ECG repolarization abnormalities. *N Engl J Med* 2008; 358:152-61.

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