Preface

Arrhythmias in Athletes: From Pathologic Substrates to Life-Saving Shock Therapy

Cristina Basso, MD, PhD, Gaetano Thiene, MD, Domenico Corrado, MD, PhD
Editors

Sudden cardiac death (SCD) of an athlete is always a powerful and tragic event, which devastates families, other competitors, institutions (high school, college, or professional organization), sports medicine teams, and the community. The sudden demise of an athlete has a tremendous appeal to the media because it affects apparently healthy individuals who are regarded as heroes and the healthiest group in society. Instinctively, everyone wonders what intervention might have prevented the death. For centuries it was a mystery why cardiac arrest should occur in vigorous athletes, who had previously achieved extraordinary exercise performance without complaining of any symptoms. The cause was generally ascribed to myocardial infarction, even though evidence of ischemic myocardial necrosis was rarely reported. It is now clear that the most common mechanism of sudden death during sports activity is an abrupt arrhythmia as a consequence of a wide spectrum of cardiovascular diseases. The fact that cardiac arrest during sports activity is usually caused by abrupt ventricular fibrillation explains why demonstration of ventricular arrhythmias in the athlete is regarded as a warning sign of increased risk of SCD.

In a provocative article published in the Lancet in 2005, we used a quotation from the Greek dramatist Menander, “Those whom the gods love die young,” in reference to SCD among athletes. We wanted to highlight that by virtue of the important results gained by systematic investigation of SCD in young people and athletes, sports-related fatalities should no longer be considered as predestined and beyond our control, but a consequence of an underlying heart disease that may be identified and treated during life.

An international panel of cardiologists and sports medical physicians, with expertise in the fields of cardiovascular pathology, electrophysiology, athletic screening, and management of athletes, has contributed to this issue of Cardiac Electrophysiology Clinics, which is designed to offer a comprehensive overview of rhythm and conduction disturbances in athletes and will be an essential reference for clinical cardiologists, sports medicine doctors, and general practitioners on early diagnosis, risk stratification, and therapy for arrhythmic events with the aim of preventing sports-related SCD.

The issue first addresses the etiopathogenesis of SCD in the athlete and its prevention by either preparticipation screening (primary prevention) or the use of an automated external defibrillator in the field (secondary prevention). The vast majority of athletes who die suddenly have underlying structural heart diseases, which provide a substrate for ventricular tachycardia/fibrillation leading to cardiac arrest. There is compelling evidence that timely recognition by electrocardiographic screening of cardiovascular diseases that
pose a risk of life-threatening arrhythmias in the athlete is life-saving. A time-trend analysis of the incidence of SCD in young competitive athletes aged between 12 and 35 years in the Veneto region of Italy between 1979 and 2004 demonstrated a sharp decline of approximately 90% in death rates among athletes after the introduction of the national screening program in 1982, particularly because of fewer sudden deaths from cardiomyopathies. By comparison, mortality did not change significantly over the study period among the unscreened sedentary population. A parallel study of a large population of young competitive athletes undergoing preparticipation screening at the Centre for Sports Medicine showed that the decline in mortality from cardiomyopathies paralleled the concomitant increase in the number of affected athletes who were identified and disqualified from competitive sports over the screening period. Automated external defibrillators (AEDs) are an integral link in the “chain of survival” and their prompt use promotes higher survival rates from sudden cardiac arrest during sports. The presence of a free-standing AED at sporting events is a valuable backup for unpredictable arrhythmic cardiac arrest due to conditions unrecognized by electrocardiographic screening.

This Cardiac Electrophysiology Clinics issue provides considerable information on the cardiovascular evaluation of leisure-time master athletes and marathon runners, on the role of exercise testing for risk stratification, and on specific problems with treatment of athletes presenting with syncope, atrial fibrillation, or bradyarrhythmias. The topic of heart muscle disease and sports is also covered, with particular reference to a possible exercise-induced right ventricular cardiomyopathy in overtrained athletes. Finally, there is a discussion on the safety and arrhythmic risks of sports activity in those with an internal implantable defibrillator.

We are confident that the issue will help physicians in the complex management of arrhythmias occurring in individuals engaged in sports activity, which represents a frequent clinical challenge because of the increased sports participation at all ages.

ACKNOWLEDGMENTS

The Editors and their groups are supported by the Fondazione Cariparo, Padova and Rovigo; and by the Registry of Cardio-Cerebro-Vascular Pathology, Veneto Region, Venice, Italy.

The Editors also acknowledge the Association for Research of Arrhythmic Cardiac Diseases (A.R.C.A., via Gabelli, 61, 35121 Padua-Italy; http://anpat.unipd.it/arca/) and Mrs Chiara Carituran and Mr Marco Pizzigolotto for their assistance in preparing this book.

Domenico Corrado, MD, PhD
Division of Cardiology
Department of Cardiac, Thoracic and Vascular Sciences
University of Padova
Via Giustiniani, 2
35121 Padova, Italy

Cristina Basso, MD, PhD
Cardiovascular Pathology
Department of Cardiac, Thoracic and Vascular Sciences
University of Padova
Via A. Gabelli 61
35121 Padova, Italy

Gaetano Thiene, MD
Cardiovascular Pathology
Department of Cardiac, Thoracic and Vascular Sciences
University of Padova
Via A. Gabelli 61
35121 Padova, Italy

E-mail addresses:
domenico.corrado@unipd.it (D. Corrado)
cristina.basso@unipd.it (C. Basso)
gaetano.thiene@unipd.it (G. Thiene)