CAUSES OF CARDIAC DEATH WITH YOUNG ATHLETES THAT RECEIVED TO INTENSIVE CARE UNIT BECAUSE OF SUDDEN DEATH AFTER RESUSCITATION

Mustafa YILDIZ MD

From:
Sakarya University Internal Medicine and Cardiology, Sakarya, Turkey

Address for reprints
Mustafa YILDIZ, MD
Bayar Cad, Gulbahar Sok, Emniyet Sitesi, A Blok, A Kapisi, D6, Kozyatagı
Istanbul/TURKEY
Telefon: +905323711701
E-mail: mustafayilldiz@yahoo.com

Young competitive athletes are individuals under 35 years who participate in an organized team or individual sport that requires regular exercise and competition. The sudden cardiac death of a young athlete is the most tragic event in sports. Most young athletes who die suddenly have undiagnosed structural cardiac disease. Although atherosclerotic coronary artery disease is the most common cause of sudden cardiac death >35 years, younger competitive athletes have a wide range of cardiovascular causes including congenital and genetic disorders. The most common causes are hypertrophic cardiomyopathy, arrhythmogenic right ventricular cardiomyopathy and congenital coronary artery anomalies. The young athletes that received to intensive care unit because of sudden death after resuscitation must think this causes. The equipment and nursing must be perfect in this intensive care units.
Key words: Sudden cardiac death, young athlete, intensive care unit

The sudden cardiac death, as an event that is unexpected, non-traumatic and resulting from sudden cardiac death, of a young competitive athlete is the most awful event during the sportive activities (2-6). There are usually under 35 years who participates in an organized team or individual sport requiring systematic exercises and regular competition (7). The risk of sudden cardiac death in a population of high school student athletes was small, in the range of one in 200.000 per year, and was higher in male athletes (8). Sudden deaths in athletes are usually caused by previously undiagnosed structural heart disease (7). While atherosclerotic coronary artery disease is the most common cause of sudden cardiac death in >35 years athletes (1:15 000 joggers and 1:50 000 marathon runners) (7), younger competitive athletes have usually a

congenital and genetic disorders including hypertrophic cardiomyopathy, the sarcomeres in the heart increase in size, which results in the thickening of the heart muscle, arrhythmogenic right ventricular dysplasia, congenital coronary artery anomalies such as anomalous origin of the left coronary artery from the pulmonary artery (ALCAPA), aortic rupture in Marfan's syndrome, is a genetic disorder of the connective tissue, myocarditis, aortic valve stenosis, mitral valve prolapse is characterized by the displacement of an abnormally thickened mitral valve leaflet into the left atrium during systole, channelopathies including long QT syndrome, Brugada syndrome, may be associated with mutation in the gene that encodes for the sodium ion channel in the cell membranes of the myocytes, and catecholaminergic polymorphic ventricular tachycardia (9-14).

Sudden death during sports can also be the result of a non-penetrating blow to the thorax that may trigger sudden ventricular fibrillation, is the most commonly identified arrythmia in cardiac arrest patients, in the absence of any structural cardiac diseases (commotio cordis) (15). Maron et al (15) showed that commotio cordis events occurred most commonly during organized sporting events (62%), such as baseball, but 38% occurred as part of daily routine and recreational activities. Their observations emphasized that the dangers implicit in striking the chest sharply under any condition, including light or inadvertent blows.

Nowadays, the current management such as intensive medical therapy, perfect nursing, mechanical ventilation, therapeutic hypothermia for improving brain functions, dialysis techniques of in intensive care unit is technically successful; however, subsequent mortality is still high. Therefore, the young athletes that received to intensive care unit because of sudden cardiac death after resuscitation must think the important causes including hypertrophic cardiomyopathy, aortic valve stenosis, long QT syndrome, Brugada syndrome and congenital coronary artery anomalies, and must be correct therapy. Thereafter, the survival of in intensive care unit cardiac arrest of the young competitive athletes may be improving.

REFERENCES

1. Denton R, Thomas AN. Cardiopulmonary resuscitation: a retrospective review. Anaesthesia 1997, 52:324-7.
2. Maron BJ, Thompson PD, Puffer JC, McGrew CA, Strong WB, Douglas PS, Clark LT, Mitten MJ, Crawford MH, Atkins DL, Driscoll DJ, Epstein AE. Cardiovascular preparticipation screening of competitive athletes. A statement for health professionals from the Sudden Death Committee (clinical cardiology) and Congenital Cardiac Defects Committee (cardiovascular disease in the young), American Heart Association. Circulation 1996;94(4):850-6.
3. Futterman LG, Lemberg L. Sudden death in athletes. Am J Crit Care 1995;4(3):239-43.
4. Corrado D, Thiene G, Nava A, Rossi L, Pennelli N. Sudden death in young competitive athletes: clinicopathologic correlations in 22 cases. Am J Med 1990;89(5):588-96.
5. Epstein SE, Maron BJ. Sudden death and the competitive athlete: perspectives on preparticipation screening studies. J Am Coll Cardiol 1986;7(1):220-30.
6. Maron BJ, Roberts WC, McAllister HA, Rosing DR, Epstein SE. Sudden death in young athletes. Circulation 1980;62(2):218-29.
7. Maron BJ, Thompson PD, Puffer JC, McGrew CA, Strong WB, Douglas PS, Clark LT, Mitten MJ, Crawford MH, Atkins DL, Driscoll DJ, Epstein AE. Cardiovascular preparticipation screening of competitive athletes. A statement for health professionals from the Sudden Death Committee (clinical cardiology) and Congenital Cardiac Defects Committee (cardiovascular disease in the young), American Heart Association. Circulation 1996;94(4):850-6.
8. Maron BJ, Gohman TE, Aeppli D. Prevalence of sudden cardiac death during competitive sports activities in Minnesota high school athletes. J Am Coll Cardiol 1998;32(7):1881-4.
9. Virmani R, Burke AP, Farb A, Kark JA. Causes of sudden death in young and

middle-aged competitive athletes. Cardiol Clin 1997;15(3):439-66.
10. Maron BJ, Epstein SE, Roberts WC. Causes of sudden death in competitive athletes. J Am Coll Cardiol 1986;7(1):204-14.
11. Cho Y, Park T, Yang DH, Park HS, Chae J, Chae SC, Jun JE, Kwak JS, Park WH. Arrhythmogenic right ventricular cardiomyopathy and sudden cardiac death in young Koreans Circ J 2003;67(11):925-8.
12. Maron BJ. The young competitive athlete with cardiovascular abnormalities: causes of sudden death, detection by preparticipation screening, and standards for disqualification. Card Electrophysiol Rev 2002;6(1-2):100-3.
13. Drezner JA. Sudden cardiac death in young athletes. Causes, athlete's heart, and screening guidelines. Postgrad Med 2000;108(5):37-44, 47-50
14. Basso C, Maron BJ, Corrado D, Thiene G. Clinical profile of congenital coronary artery anomalies with origin from the wrong aortic sinus leading to sudden death in young competitive athletes. J Am Coll Cardiol 2000;35(6):1493-501.
15. Maron BJ, Gohman TE, Kyle SB, Estes NA 3rd, Link MS. JAMA Clinical profile and spectrum of commotio cordis 2002;287(9):1142-6.