

## Importance of automatic external defibrillator: save a life in athletic fields

### Dear Editor-in-Chief

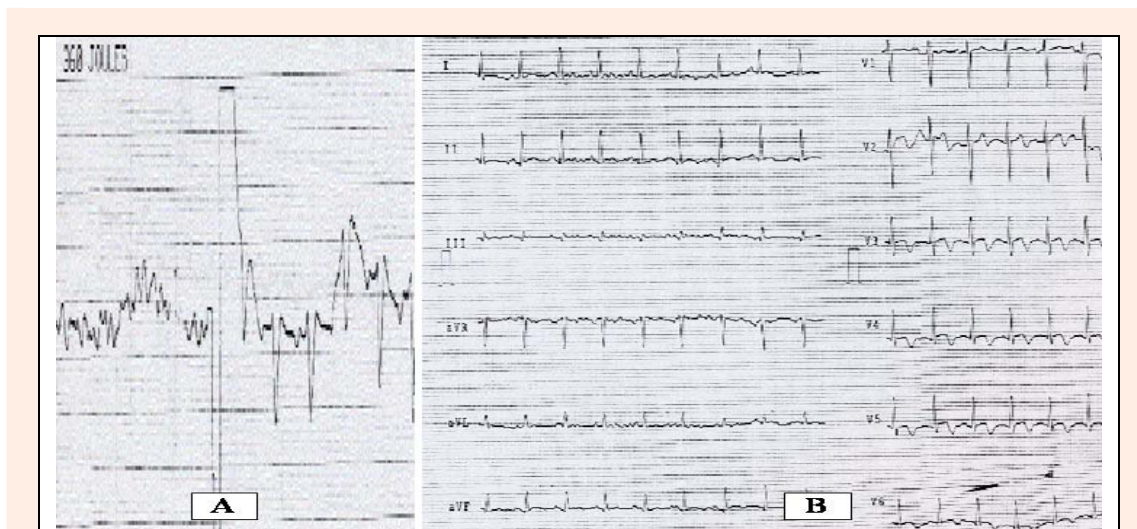
Sudden cardiac death (SCD) among athletes is major unexpected and tragic event that is more detected in world population within recent years due to the increasing and widespread preoccupation with sports (Maron et al., 1996; Maron, 2003). Acute cardiovascular collapse is the most common cause of nontraumatic exercise related death in young athletes. Corrado et al. (2003) also have reported that sportive activity is not a cause of the increased mortality; rather, it acts as a trigger for cardiac arrest in the presence of underlying cardiovascular diseases predisposing to life-threatening ventricular arrhythmias during physical exercise. Moreover, in case of any event, it is accepted that early defibrillation is the most important factor of cardiopulmonary resuscitation for saving of a life as following case.

A 31-year-old male, amateur soccer player was admitted to the hospital after cardiac arrest during a match. He had no history of heart disease, diabetes mellitus, hypertension, hyperlipidemia, smoking or drug use. There was no family history of coronary artery disease and SCD. He had general fatigue, fever and flu-like symptoms two weeks prior to the event. On the day of presentation, the athlete experienced the sudden onset of palpitation and then collapsed during the match in where was near a hospital. Cardiopulmonary resuscitation was immediately initiated and then automated external defibrillator (AED) had been applied within three to four minutes after the event. Ventricular fibrillation had been identified and immediately delivered a shock, thereby restoring a normal rhythm (Figure 1A). Approximately fifteen minutes later of resuscitation spontaneous respira-

tion with a palpable pulse and sinus rhythm had been resumed. Cardiovascular and neurologic examinations were normal after resuscitation procedures.

In the emergency room, the patient's vital signs were blood pressure of 167/72 mmHg, heart rate of 102, and temperature of 37, 2 °C. There were inverted T waves in precordial leads in 12 lead ECG (Figure 1B). On admission, the patient's blood sedimentation rate was 42 mm/h, leukocytes were 12.300 per mm<sup>3</sup>. Initial creatine kinase was 751 (0-245 U.l<sup>-1</sup>), with a myocardial band fraction of 11.2 (0-7.5 ng.ml<sup>-1</sup>) and troponin T test was positive. Epstein-Barr virus-specific antibody was found positive. Left ventricular systolic and diastolic functions were normal, and also there was no left ventricular wall abnormality. Coronary arteries were appeared completely normal in coronary angiographic examination. The patient refused endomyocardial biopsy and invasive electrophysiological studies. At seventeen hospitalized day, he had not any complications and was discharged.

In the case, there are several troubles for the correct diagnosis due to lack of three testing and analysis: testing coronary spasm, endomyocardial biopsy and electrophysiological study. Coronary artery disease and myocarditis were predominantly suspected silent cardiac diseases in this case. The demonstration of T-wave inversion after the SCD arrest may suggest the occurrence of a transient ischemic episode. Unfortunately, drug tests for evaluating coronary vasoreactivity during coronary angiography able to rule out the presence of flow-limiting coronary stenoses were not performed. In addition, myocarditis was another possible diagnosis for this case due to lack of myocardial biopsy. Myocarditis incidence is accepted approximately 3% SCD in young competitive



**Figure 1.** Ventricular fibrillation and defibrillation with discharge of 360 J (A), the tracing shows inverted T waves in precordial leads (B).

athletes (Maron et al., 1996), however, true incidence of myocarditis in athletes is not known. Although some patients may develop rapidly progressive dyspnea, the majority of patients with acute myocarditis have a clinically inapparent course and cardiovascular symptoms may be minimal. The possible effect of acute inflammation of the myocardium promotes ventricular arrhythmias or acts as a trigger.

Moreover, the early identification of the diagnosis of silent cardiovascular disease has still gold standard method for prevention of SCD in athletes. In case of any cardiac event, team physician and paramedics should be skilled in urgent application of cardiopulmonary resuscitation. Importantly, equipments (especially portable defibrillator, transportation tools) for effective and successful resuscitation should be available and presence of important parts must be checked before sports activity (Kasikcioglu, 2006). Furthermore, SCD is not only observed among athletes but also developed among spectators who have mental stress anger and cardiac risk factors are known triggers of acute myocardial infarction and other cardiac complications (Katz et al., 2006). Due to these reason, the public access defibrillation along games period should be proposed in order to reduce the burden of SCD (Katz et al., 2006). Nonetheless, the availability of an AED at a sporting event should not be construed as absolute protection against a fatal outcome from a SCD (Myerburg et al., 2005). The AED should be available at educational facilities that have competitive athletic programs (including intramural sports and conditioning classes), stadiums, arenas, and training sites, with trained responders identified among the permanent staff (Myerburg et al., 2005).

In conclusion, as preventive aspect, bed rest and close physical examination monitoring should be recommended for athletes who have flu-like syndrome. What is really remarkable is that they must not return to competition without recovery of their all symptoms and cardiac findings. The essential point is that automatic external defibrillator should be readied and immediately applied in case of SCD in the athletic fields.

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