akademik acil tıp dergisi

ST Elevation Due To Heatstroke, A Case Report

Güneş Çarpmasına Bağlı ST Yüksekliği, Olgu Sunumu

Nihat Söylemez[1], Mehmet Memduh Baş[1], Ayça Açıkalın[2], Hüseyin Aksoy[3], Recep Demirbağ[1]
[1]Department of Cardiology, School of Medicine, Harran University, Şanlıurfa, Turkey
[2]Department of Emergency Medicine, Gaziantep 25 Aralık Hospital, Gaziantep, Turkey
[3] Department of Family Medicine, School of Medicine, Harran University, Şanlıurfa, Turkey

Abstract
Cardiac dysfunction and ECG abnormalities are rarely seen in the heatstroke patient. In our case, a 27 year old male patient who stayed under direct sunlight for a long time, there was an evident prevailing ST elevation,,in all derivations in his ECG,, with an especially clear inferior derivation. On the third day of his hospitalization, ST elevation decreased and the patient, whose general condition was satisfactory, was discharged from the hospital.
(JAEM 2010; 9: 150-1)
Key words: ST Elevation, heatstroke

Received: 01.01.2009 **Accepted:** 08.03.2009

Özet
Güneş çarpması ile nadiren kardiyak disfonksiyon ve EKG bozuklukları görülebilir. Bizim olgu sunumumuzda, uzun süre güneşin altında kalan 27 yaşındaki erkek hastanın EKG'sinde özellikle inferiyor derivasyonda belirgin ancak tüm derivasyonlarda görülen ST yüksekliği saptanmıştır. Yatışının üçüncü gününde ST yüksekliği azalmış, genel durumu iyi olan hasta taburcu edilmiştir.
(JAEM 2010; 9: 150-1)
Anahtar kelimeler: ST yüksekliği, güneş çarpması

Alındığı Tarih: 01.01.2009 **Kabul Tarihi:** 08.03.2009

Introduction

Heatstroke is an acute thermoregulatory failure, central nervous system disorder and causes multi organ deficiency. Cardiac complications and certain nonspecific ECG changes have been documented in heat stroke cases (1-3). We report a case of heat stroke who showed ST elevation in the inferior derivation.

Case report

A 27 year old male patient, who stayed under direct sunlight for a long time, was admitted to the emergency room of our institution with loss of consciousness. On arrival, the patient was in a stupor. In his physical examination, blood pressure was 60/40 while sitting and lying, and pulse rate was 92, which was regular. The other systems were within normal limits. There was no cardiac risk factor expect smoking. Hemoglobin 16.8 gr/dL, hematocrit %50.2, urea 46mmg/dL, creatinine 1.95 mg/dL, AST 71 U/L, ALT 59 U/L, CPK 966 U/L, CK-MB 39.9 U/L and troponin I <0.05 ng/ml were found in his laboratory findings. There was an evident prevailing ST elevation, especially clear in the inferior derivation, at all derivations in his ECG (Figure 1). His echocardiography was within the normal limits. Regional wall movement dysfunction and pericardial effusion were not seen. The patient was hospitalized in the coronary intensive care unit and his treatment included supplemental oxygen, intravenous fluid supplementation and cardiac monitoring. One day later, his complaints were decreased. His urea, creatinine and hepatic enzymes were in normal levels. While the serum CPK level was slightly increased (1188 U/L), CKMB level decreased (26.8 U/L). On the third day of his hospitalization, ST elevation decreased in the inferior derivation, however no other ST change or Q waves were detected in the patient's ECG (Figure 2). Coronary angiography was recommended but the patient refused. It was decided that the ECG change seen in the patient was due to the ST elevation caused by heatstroke. The patient, whose general condition was good, was discharged from the hospital.

Discussion

Heatstroke is a clinical condition which is generally seen as a functional disorder of the central nervous system and causes multi organ deficiency. Rhabdomyolysis, acute renal and hepatic deficiency and DIC can be seen in serious heatstroke (4, 5). It is known that ECG abnormalities and cardiac dysfunction can rarely been seen in these patients (1-3).

Correspondence to/Yazışma Adresi: Asistan Nihat Söylemez, Department of Cardiology, School of Medicine, Harran University, Şanlıurfa, Turkey
Gsm: +90 505 497 91 81 e.mail: drnihats@hotmail.com
doi:10.4170/jaem.2009.14622

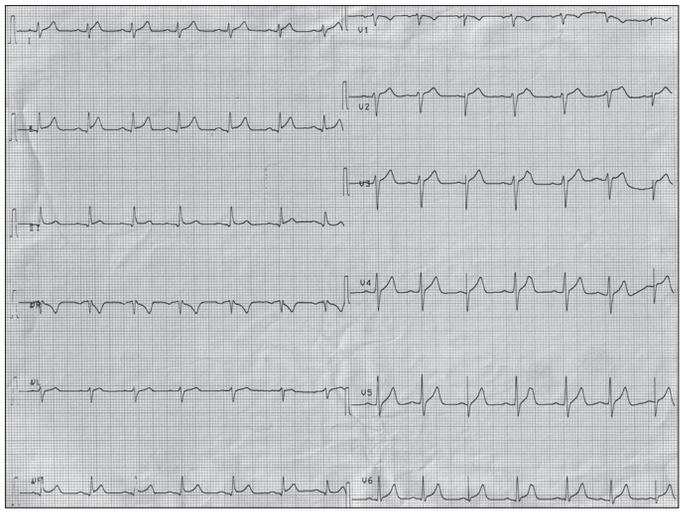

Figure 1. First day, ST elevation at especially clearly inferior derivation, besides at all of derivation

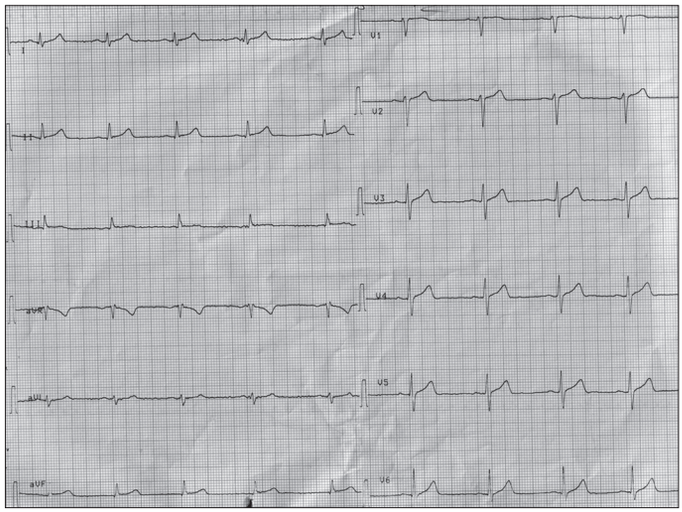

Figure 2. Thirty day, resolution of ST elevation at inferior derivation

Kew and et al (3). have shown that there were prevailing ST change, prolonged QT interval and T wave abnormalities in 26 cases of heatstroke. Also, there were localized ST elevations in two cases. Another case presentation was a young patient who had an inferior myocardial infarction after heatstroke (4). A heatstroke case currently studied by Wakino et al (5). showed ST segment elevation in ECG, enzyme increase showing cardiac injury and global hypokinesia in echocardiography. There is a relationship between our study and the other studies.

Because of the ST elevation change, especially the inferior derivation, within three days, we postponed early repolarization (6). In addition, coronary vasospasm caused ST elevation in this patient. The cause of ST change in the case of heatstroke is still being argued. It is known that adhesion molecules such as plasma endothelin and Von-Willebrand factor increase in cases of heatstroke (7, 8). It is thought that endothelial injury accompanies with molecule increase and causes myocardial infarction due to coronary vasospasm.

Conflict of Interest

No declared

References

1. Kew MC, Tucker RB, Bersohn I, Seftel HC. The heart in heatstroke. Am Heart J 1969; 77: 324-35.
2. Garcia-Rubira JC, Aguilar J, Romero D. Acute myocardial infarction in a young man after heat exhaustion. Int J Cardiol 1995; 47: 297-300.
3. Wakino S, Hori S, Mimura T, Miyatake S, Fujishima S, Aikawa N. A case of severe heat stroke with abnormal cardiac findings. Int Heart J 2005; 46: 543-50.
4. Clowes GH Jr, O'Donnell TF Jr. Heat stroke. N Engl J Med 1974; 291: 564-7.
5. Knochel JP. Environmental heat illness. An eclectic review. Arch Intern Med 1974; 133: 841-64.
6. Mehta M, Jain AC, Mehta A. Early repolarization. Clin Cardiol 1999; 22: 59-65.
7. Bouchama A, Hammami MM, Haq A, Jackson J, al-Sedairy S. Evidence for endothelial cell activation/injury in heatstroke. Crit Care Med 1996; 24: 1173-8.
8. Giustolisi R, Musso R, Cacciola E, Cacciola RR, Russo M, Petralito A. Abnormal plasma levels of factor VIII/von Willebrand factor complex in myocardial infarction -expression of acute phase reaction or index of vascular endothelium damage? Thromb Haemost. 1984; 51: 408.