Priorities in Patient Presenting to EmergencyDepartment with Chest Pain

Göğüs Ağrısı İle Acil Servise Başvuran Hastada Öncelikler

Hasan Büyükaslan[1], Uğur Lök[2], Umut Gülaçtı[2]
1.Emergency Department, Faculty of Medicine, Harran University, Sanliurfa, Turkey
2.Emergency Department, Faculty of Medicine, Adıyaman University, Adıyaman, Turkey
Corresponding author:
Hasan Büyükaslan Asst. Prof. M.D.; Harran University, Faculty of Medicine, Resource and Education Hospital, Emergency Department, Meteorology Street 63300, Sanliurfa, Turkey.
Tel: +90 4143183402, Fax: + 90 (414) 315 11 81, Mobile: +90 0 530 6446845
E-mail address: buyukaslanh@harran.edu.tr

Geliş tarihi / Received: 25.04.2016 **Kabul tarihi / Accepted:** 02.05.2016

Abstract
In addition to rapid clinical evaluation, preferential and right electrocardiographic assessment and also insistent follow up of the complaint of chest pain that constitute a significant percentage of emergency department admission, provides a reduction in mortality and morbidity in the patients admitted to emergency department with chest pain. Unnecessary and time-consuming diagnostic tests should be avoided in this patient population, especially before the electrocardiographic evaluation.
Keywords: Emergency department; Electrocardiography; Chest pain
Öz
Acil servise başvuruların önemli bir yüzdesini oluşturan göğüs ağrısında hızlı klinik değerlendirmeye ilave olarak öncelikli ve doğru elektrokardiyografik değerlendirme ile ısrarcı takibin yapılması, mortalite ve morbiditede azalma sağlamaktadır. Bu hastalarda özellikle de elektrokardiyografik değerlendirme öncesinde yapılacak gereksiz ve zaman alıcı tetkiklerden uzak durulmalıdır.
Anahtar kelimeler: Acil servis; Elektrokardiyografi; Göğüs ağrısı

INTRODUCTION

Patients present to emergency department with chest pain could become like problem tangles that should be solved by physicians(1).While Acute Coronary Syndromes (ACS) were detected in 1/5 of patients presenting with chest pain, diseases with high mortality rates such as pulmonary thromboembolism (PE) and aortic dissection constitute a small percentage of patients (2). Musculoskeletal chest pain, pain originated from other thoracic and intra-abdominal organs and psychiatric originpains constitute a major portion of the remaining causes of chest pain(2). Because of high sudden death risk in patients with cardiac origin chest pain, accurate differential diagnosis of wide range chest pain types in a short time is very important. The common causes of chest pain are mentioned in the Table1.

Medical history of the patient is important in the differential diagnosis of cardiac symptoms.Presence of heart disease, previously stable angina pectoris (SAP) history, multiple risk factors for coronary

artery disease and anti-ischemic drug usage are important details. Risk factors such as family history, smoking, dyslipidemia, hypertension (HT), diabetes mellitus (DM), presence of cerebrovascular disease (CVD) and peripheral arterial disease (PAD) should be examined quickly.

Chest pain is the most common and the most important symptom of the patients admitted to emergency department with chest pain(2,3).Chest pain caused by myocardial ischemia due to severe or total occlusion of the coronary arteries, defined as angina pectoris (2-4).Angina pectoris in acute coronary syndrome have some definitive characteristic features. These are precipitated by factors such as; stress, exercise, cold, easing but not completely covering with sublingual short-acting nitrates, pressure or burning feeling on retrosternal and precordial location(4).

Angina may occur in the form of previous stable angina pectoris that arises withless effort, last longer and require more rest or nitrate to relief, or it can be seen as pain that lasts more than 20 minutes and occurs also during rest(4,5).Though the location of pain is usually in precordial and retrosternal region, it can be seen in far below the chin and the settlement usually can be in any region from epigastric region to chin. It may radiate to both arms. As a difference from stable angina pectoris, this pain does not relief with sublingual short-acting nitrate preparations or alleviatespartially (4).

Although it is thought that; the diagnosis of ACS can be considered easy with existing knowledge, unfortunately it is overlooked in some cases. Additionally loss of time before diagnosis causes an increase in morbidity and mortality(4).Patients with overlooked diagnosis generally don't admit with typical clinical presentation. Atypical clinical presentations include; the short duration of angina, slight presence of pain, inability to feel pain because of the high pain threshold or autonomic neuropathy, presentation with dyspnea, admission with cardiac arrest or unable to express herselfdue toCVD, admission with accompanying predominant clinical presentations and undiagnosable ECG findings. These situations may delay the diagnosis of the physician in the emergency department (4).It should not forget that; to begin treatment as early as possible in patients with ACS, reduces the amount of myocardial ischemic tissue which becomes necrotic tissue and it reduces the risk of mechanical and arrhythmic complications (5).

A physician who meet a patient with chest pain, should complete the anamnesis,physical examination and an ECG recording within 10 minutes (6,7).In the absence of ischemia findings in ECG, the diagnosis of ACS should not be excluded and patient should be followed up. Because a significant proportion of patients whose diagnosis were overlooked have been misdiagnosed. In this situation, patients' ECG record should be taken at the time of the rise in complaints, or ECG records and cardiac enzyme samples should be repeated in each 4 hours and they must be followed-up at least 12 hours, even if there is an improvement in complaints (2).Patients who have no ECG and enzyme changes during twelve- hour follow-up periode, are in low risk group and can be followed-up as outpatients even though they are with ACS(2).

ST-T wave changes which are consecutive in precordial leadsor at least in two derivation that records the same area in the ECG, support the diagnosis of acute coronary syndrome. Isolated posterior and isolated right myocardial infarction (MI) diagnosis can be overlooked due to inappropriate assessment or not to record of ECG, though rarely(8).

Some of the patients are admitted with gastrointestinal complatints such as; abdominal pain, nausea and vomiting that have been suggested to gastointestinal pathologies (2). These patients are evaluated firstly with ultrasound and computerized tomographyin terms of intra-abdominal pathology. These radiological evaluations are usually conducted in isolated rooms. It is not possible to do emergency action in these rooms in the situation of cardiac arrest. Also the time for reporting the investigations lead to a waste of time in these patients. Besides delay in the diagnosis, it may result in fatal complications in patients with cardiac risk factors and the history of coronary artery disease, to perform these diagnostic tests before comprehensive evaluation and ECG record. Especially if an acute pathology is not considered to explain this clinical situation, patients can be discharged without seeing the ECG records. Also in some of the patients, ACS may accompany for abdominal pathology. It makes the diagnosis more difficult. For example, angina due to eating too and pain due to mesenteric artery ischemia can occur simultaneously and these pain types can respond in a similar way to sublingual and a short-acting nitrate(9). Additionally, esophageal spasm related pain decreases with sublingual short-acting nitrates (10). In this situation, acute coronary syndromes should be considered firstly because of their high morbidity and mortality rates. Therefore, it must be prioritized, the cardiac evaluation and ECG recording of the patients who admitted to the emergency department with chest pain and have high cardiac risk.

Telecardiography is required in the patients with chest pain for the differentiation of other pathologies associated with high mortality, such as pneumothorax, aortic dissection and pulmonary thromboembolism (11,12). But performing the telecardiography firstly in emergency conditions will prolong the diagnostic period the same as in ultrasound imaging. And if it is not performed bedside, in a situation of malignant arrhythmia, it will cause malpractice. Therefore,it must not be performed before cardiac evaluation and ECG recording. Again, if possible, it should be performed bedside in the emergency department and the patient must be monitorized.

When the patients who have admitted to emergency department as repeated times due to chronic diseases such as peptic ulcus, dyspepsia, CVD, they were evaluated primarly in terms of old diseases. Although they have admitted to the emergency department with chest pain. Due to this situation, the diagnosis and treatment of ACS could be delayed (13).

Especially waiting to get response to antacid preparations in dyspepsia and peptic ulcus pain which could be misdiagnosed with inferior wall myocardial infarction, could take a long time. In addition to this, emergency physicians are prejudiced against the patients who were admitted to the emergency department for repeated times due to their psychiatric problems(12).

In patients with ACS, dynamic ECG changes are also evident in time as the enzyme changes. Especially if the patient's baseline ECG is normal, it becomes more important to monitor the ECG changes. The first ECG is diagnostic only in 50% of acute coronary syndromes(14). This may lead physicians to research to the other pathologies.

In summary, priority in the patients with chest pain must be; a quick medical history, assessment of cardiac risk and evaluation of ECG recording. Other priorities delay the diagnosis and treatment in patients with ACS for whom the minutes are very important.

Table 1. Differantial Diagnosis and Treatment of Chest Pain

DIFFERANTIAL DIAGNOSIS and TREATMENT of CHEST PAIN			
Type of pain	**Physical Examination**	**Diagnostic Tests**	**Diagnosis and Treatment**
Chest pain which have the characteristic of pressure, burning and compressing, radiates to the jaw, neck, left arm, back and epigastrium, unresponsive or partial response to sublingual nitrate, accompanied by cold sweats and fear of death	Usually normal May be sweating, crackles and heart murmurs,rarely accompany a state of shock. Blood pressure may be high, normal or low in pre-shock- shock.	ECG Cardiac enzymes Echocardiography	ACS STEMI: PTCA, thrombolytics NSTEMI: Medical or PTCA USAP: Medical or PTCA
Sudden rised pleuritic chest pain, dyspnea, hemoptysis. Especially at high risk groups	Tachypnea, tachycardia, deep venous thrombosis, hemoptysis, decrease in blood pressure, changes in consciousness, JVD	Chest graph, V / Q scan, pulmonary angiography	PE Heparin, thrombolytics, embolectomy
Sudden onsetted, ferocious, disruptive chest pain that may be radiated to the back and abdomen, and could be accompanied by neurological symptoms	New arised heart murmur, unequal blood pressure in the upper extremities	Chest graphy, echocardiography, contrast-enhanced thoracic CT, chest MRI, angiography	Aortic dissection Urgent operation
Chest pain and dyspnoea which relieves to lean forward supine and increases to cough and breathe deeply.	JVD	ECG, chest graphy, Echocardiography	Pericarditis Medical
Pleuritic chest pain and dyspnea	Decreased breath sounds	Chest graphy	Pnomothorax Follow up (little) Tube decompression(big)
Retrosternal, epigastric pain	Sensible epigastrium	Chest graphy, esophageal barium X-ray	Oesophageal rupture Surgical
Pleuritic chest pain, dyspnea, cough, chills	Fever, crackles, decreased breath sounds	Chest graphy, WBC	Pneumonia Medical
Emotional stress-induced, pointed, limited to seconds or hours of chest pain	Normal	ECG Cardiac enzymes Echocardiography	Anxious chest pain Medical
Continuous localized pain in the chest after trauma	Chest pain in the described area by pressure	ECG Cardiac enzymes Echocardiography	Traumatic chest wall pain Medical
Continuous chest pain	Pain in costochondral and xiphosternal by pressure and, swelling, redness in the relevant field	ECG Cardiac enzymes Echocardiography	Costochondritis Medical
Abbreviations: ACS: Acute Coronary Syndrome, DVT: Deep Vein Thrombosis, ECG: Electrocardiogram, JVD: Jugul ar Venous Distension, NSTEMI: Non ST Segment Elevation Myocardial Infarction, PTCA: percutaneous coronary intervention STEMI: ST-Segment Elevation Myocardial Infarction, USAP: Unstable Angina Pectoris V / Q: Ventilation - Perfusion Scintigraphy, WBC: White B lood Cell Count			

REFERENCES:

1. Alpert JS, Thygesen K, Antman E, Bassand JP. Myocardial infarction redefined-a consensus document of The Joint European Society of Cardiology/American College of Cardiology Committee for the redefinition of myocardial infarction. J AmCollCardiol 2000;36(3):959-69.

2. Braunwald E, Zipes DP, Libby P, editors. Braunwald's heart disease: a textbook of cardiovascular medicine. 7th ed. Philadelphia: W. B. Saunders, 2001:66-69.

3. Task Force Members, Montalescot G, Sechtem U, Achenbach S, Andreotti F, Arden C, Budaj A. et al. 2013 ESC guidelines on the management of stable coronary artery disease: the Task Force on the management of stable coronary artery disease of the European Society of Cardiology. EurHeart J. 2013;34(38):2949-3003.

4. Amsterdam EA, Kirk JD, Bluemke DA, Diercks D, Farkouh ME, Garvey JL, et al. American Heart Association Exercise, Cardiac Rehabilitation, and Prevention Committee of the Council on Clinical Cardiology, Council on Cardiovascular Nursing, and Interdisciplinary Council on Quality of Care and Outcomes Research. Testing of low-risk patients presenting to the emergency department with chest pain: a scientific statement from the American Heart Association. Circulation2010;122(17):1756-76.

5. Van de Werf F, Bax J, Betriu A, Blomstrom-Lundqvist C, Crea F, FalkVet al. ESC guidelines on management of acute myocardial infarction in patients presenting with persistent ST-segment elevation. RevEspCardiol 2009;62(3):293.

6. Pope JH, Aufderheide TP, Ruthazer R, Woolard RH, Feldman JA, Beshansky JR, et al. Missed diagnoses of acute cardiac ischemia in the emergency department. N Engl J Med2000;342(3):1163-70.

7. Diercks DB, Peacock WF, Hiestand BC, Chen AY, Pollack CV, Kirk JD,et al. Frequency and consequences of recording an electrocardiogram> 10 minutes after arrival in an emergency room in non–ST-segment elevation acute coronary syndromes (from the CRUSADE Initiative). Am J Cardiol2006;97(4):437-42.

8. Topol EJ, editor. Topol'sTextbook of CardiovascularMedicine. 6th ed. Philadelphia: Lippincott Williams &Wilkins, 2002: 391-410.

9.Wittels K. Aortic emergencies. Emerg Med Clin North Am 2011;29(4):789-800.

10. Omar HR, Mangar D, Khetarpal S, Shapiro DH, Kolla J, Rashad R, et al. Anteroposterior chest radiograph vs. chest CT scan in early detection of pneumothorax in traumapatients. IntArchMed2011;4(1):30.

11. Aytekin S, Aytekin V, Güzelsoy D, Öztürk M, Demiroğlu C. Koroner Arterleri Normal Olan Hastalarda AnginaPektoris Nedenleri Üstüne Bir Araştırma. GKD Cer.Derg1992;1(1):177-80.

12. Yavaşoğlu İ, KadıköylüG, Köseoğlu K, Bolaman Z.Yaşlı hastada kronik mezenterik iskeminin stentle başarılı tedavisi. Turkish Journal of Geriatrics2007;10(4):197-9.

13. Silber SH, Leo PJ, Katapadi M. Serial electrocardiograms for chest pain patients with initial non diagnostic electrocardiograms: Implications for thrombolytict herapy. Acad Emerg Med.1996;3(2):147-52.

14. Westbrook JL. Oesophageal achalasia causing respiratory obstruction. Anaesthesia.1992;47(1):38-40.