



## Göğüs Ağrısı Yönetiminde Acil Servis Hekimlerinin Rolü

### The Role of Emergency Physicians on the Management of Chest Pain

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#### ÖZET

**Giriş ve Amaç:** Göğüs ağrısı, acil serviste yaygın ve önemli bir başvuru şikayetidir. Özellikle akut koroner sendromu (AKS) içeren ayırıcı tanı acil servis hekimleri tarafından dikkatlice yapılmalıdır. Sunulan bu çalışma acil servise göğüs ağrısı şikayeti ile gelen hastaların AKS olup olmamalarına göre incelenmesini amaçlamaktadır.

**Materyal - Metod:** Çalışma, ileriye dönük olarak bir yıllık süreçte göğüs ağrısı şikayeti ile bir üniversite acil servisine başvuran hastalar ile yapıldı. Hastaların yaş, cinsiyet, özgeçmiş, acil servise geliş şekli, elektrokardiyografi (EKG) çekilme zamanı, ana tanısı, konsültasyon durumu, son durumu ve acil serviste kalış süreleri kayıt edildi. Veriler SPSS 17.0 programı ile analiz edildi.

**Bulgular:** Acil servise göğüs ağrısı ile başvuran 325 hasta çalışmaya dahil edildi. Bu hastaların %24.3'ü AKS tanısı aldı. Hastaların çoğunun (%42.5) ambulans ile acil servise geldiği, 110 (%33.8) hastanın kardiyolojiye konsulte edildiği saptandı. İleri yaş AKS ile istatistiksel olarak anlamlı düzeyde ilişkili bulundu ( $p<0.001$ ). Bunun yanında, sıkıstrıcı, baskı tarzında ve yanıcı tip göğüs ağrıları da AKS ile ilişkili saptandı ( $p<0.040$ ). Acil serviste kalış süresi AKS olan hastalarda olmayanlara göre daha kısaydı ( $p<0.001$ ).

**Sonuç:** Bu çalışma, acil servise göğüs ağrısı ile başvuran hastaların yönetiminde acil servis hekimlerinin rolüne dikkat çekmektedir. Erken ve doğru tanı özellikle AKS yönetiminde çok önemli ve elzemdir.

**Anahtar Kelimeler:** Göğüs ağrısı, acil servis, akut koroner sendrom

#### ABSTRACT

**Background and Objective:** Chest pain is a common and important admission complaint of patients in the emergency department (ED). The differential diagnosis especially in terms of acute coronary syndrome (ACS) should be done carefully by emergency physicians. The present study aims to identify patients with chest pain according to presence of ACS in the ED.

**Material and Methods:** The patients who admitted to the ED of a university hospital in a year period with chest pain complaint were enrolled into the study prospectively. The information that include age, gender, type of chest pain, duration of pain, medical history, transporting way to the ED, duration time of electrocardiography (ECG) recording, main diagnosis, consultation status, last condition of patients and length of stay of patients were recorded. The data were analyzed by SPSS 17.0 program.

**Results:** Totally 325 patients with chest pain complaint were enrolled into the study. 24.3% of patients with chest pain were diagnosed as ACS. It was found that most of the patients (42.5%) came to ED by the ambulance. 110 (33.8%) of 325 patients with chest pain were consulted with cardiologists. The older age was found to be related with ACS significantly ( $p<0.001$ ). Additionally; compressive, burning and squeezing types of chest pain were associated with ACS ( $p<0.040$ ). The length of stay in the ED was found shorter in ACS+ group than ACS- group ( $p<0.001$ ).

**Conclusion:** The presented study indicates the role of emergency physicians on the management of patients with chest pain. The early and true diagnosis of patients is very important and essential particularly for the management of ACS in the ED.

**Key words:** Chest pain, emergency department, acute coronary syndrome

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## INTRODUCTION

Chest pain is a valuable predictor of acute coronary syndrome (ACS). World Health Organization stated that cardiovascular diseases (particularly ACS) are the major causes of deaths in the worldwide (1). In the United States, ACS is the leading cause of death by higher than 25% in all causes of deaths (2). Additionally, it is found that more than one million patients with ACS hospitalized and more than 7 million patients with chest pain admitted Emergency Departments (ED) annually (3). In Europe, coronary artery disease is the most common cause of deaths accounting for 1.8 million deaths (4).

Besides ACS, chest pain can be a sign of several different diseases as acute heart failure, aortic dissection, pulmonary embolism etc. Thus, chest pain is very important symptom that needs to rapid clarification in the ED. There are some studies indicating that chest pain is most common complaint in the ED admissions in Turkey(5). The rapid and true management of chest pain can reduce mortality rates, length of stay and costs in the ED(3). Hence, the role of emergency physicians is very important on patients with chest pain. The early diagnosis and treatment can reduce mortality rate in ACS (6). It is suggested that short term mortality increased in misdiagnosed ACS patients with chest pain(7). The ECG recording and cardiac biomarkers as creatine kinase (CK), creatine kinase- myocardial band (CK-MB) and troponin provide early diagnosis in the ED(8, 9). In the light of these information, the determination of which patients have ACS and which patients have other diseases and can discharge early from the ED (10) should be done by emergency physicians as soon as possible. Additionally, the quick management of ACS is an important factor of decreased mortality after diagnosis in the ED (11).

In the present study, the patients with chest pain complaint were evaluated according to having ACS or not. To the best of our knowledge, the ED literature has some deficiencies in this issue. Thus, it is aimed to identify management of chest pain in the ED for guiding and contributing Turkish literature.

## MATERIAL AND METHODS

The patients who have been admitted to Emergency Department of a University Hospital, because of chest pain, between January 2014 and January 2015, have been evaluated prospectively in the study. The patients who admitted in this 1-year period with chest pain complaint were enrolled into the study. Their information recorded in the prepared study forms which include age, gender, type of chest pain, duration of pain, medical history, transporting way to the ED, duration time of electrocardiography (ECG) recording, main diagnosis, consultation status, last condition of patients and length of stay in the ED. ECG abnormalities and abnormal cardiac biomarkers were used for diagnosis of ACS. The data from the prepared study forms has been loaded into SPSS 17.0 program, and statistical analysis has been performed on them. The study protocol was approved by the Local Ethics Committee of Kafkas University, Faculty of Medicine and written informed consents were obtained from the studied participants.

### Statistical Methods

The analyses of data were performed with statistical software SPSS inc.17.0 (Chicago, IL, USA). Normal distribution of continuous variables was analyzed by the Kolmogorov-Smirnov normality test. The continuous variables were presented in the form of the average (Mean)  $\pm$  standard deviation (SD) or median and minimum-maximum values and categorical variables were expressed with numbers (n) and percentage (%). Mann-Whitney U test and Student's t test were used for comparisons of the groups. Chi-square tests and Fisher's exact chi-square test were used to evaluate categorical variables used in the study. P-values less than 0.05 were considered statistically significant.

## RESULTS

A total of 325 patients admitted to ED due to chest pain, between January 2014 and January 2015. Their median age was 56 (min.17-max.93). 208 (64%) male and 117 (36%) female patients had admitted, and the male/female ratio: was

1.8. Their medical history was evaluated and it is found that 40 (12.3%) patients had a history of ACS and 15 (4.6%) patients had a history of Coronary Artery Bypass Grafting (CABG).

The transport ways to the ED of patients were evaluated. Most of the patients (42.5%) came to the ED by the ambulance of 112 Emergency Medical Services. Additionally, 31.7% of patients came to the ED by relatives of patients and 25.8% came to the ED by themselves. The type of chest pain was interrogated. The most common type of chest pain was compressive (13.2%).

110 (33.8%) of 325 patients who admitted to the ED with a complaint of chest pain were consulted with cardiologists. 54 (16.6%) of patients were performed coroner angiography, 27 (8.3%) of patients were hospitalized in the coronary care unit and 6 (%1.8) of patients were hospitalized in the cardiology service.

The main diagnosis of patients were identified and 79 (24.3%) of patients were diagnosed as acute coronary syndrome. 140 (43.1%) patients were diagnosed as non-specific chest pain. Other diagnoses were a wide range of diseases as cholecystitis, gastroesophageal reflux, pneumothorax, chronic obstructive pulmonary disease, aortic dissection etc. (Table 1). 31 (9.5%) of patients were consulted other departments according to pre-diagnosis.

**Table 1.** Main diagnosis of patients with chest pain.

Main Diagnosis	Number of Patients (n)	Percentage (%)
Acute coronary syndrome	79	24,3
Non-specific chest pain	140	43,1
Upper airway tract infections	25	7,7
Pneumonia	17	0,6
Myalgia	6	1,8
Hypertensive urgency	25	7,7
Chronic obstructive pulmonary disease	6	1,8
Cholecystitis	2	0,6
Gastroesophageal reflux	14	4,3
Pneumothorax	1	0,3
Aortic dissection	1	0,3
Congestive heart failure	4	1,2
Anxiety	5	1,5

Patients were divided into 2 groups according to main diagnosis as ACS + and ACS -. They were evaluated by chi-square test ( $p < 0.01$ ). In the ACS+ group, the patients were older than ACS- group and it was statistically significant ( $p < 0.001$ ).

The duration time of ECG recording in the ED was shorter in ACS+ group than ACS - group and it was statistically significant ( $p < 0.044$ ). Additionally, the length of stay in the ED was found shorter in ACS+ group than ACS- group and it was statistically significant ( $p < 0.001$ ) (Table 2).

According to types of chest pain, compressive, burning and squeezing types were common in ACS+ group by 1/3 ratio. These types of chest pain were common in ACS- group, too by 1/5 ratio. Compressive, burning and squeezing types of chest pains were significantly more common in ACS+ group ( $p < 0.040$ ). The duration of chest pain was evaluated and compared between ACS+ and ACS- groups. The duration time of chest pain was significantly shorter in ACS+ group than ACS - group ( $p < 0.001$ ) (Table 2).

**Table 2.** The comparison of patients as ACS+ and ACS-

	ACS+ (median)	ACS- (median)	P
Age	64	53	<0.001
Duration time of ECG recording (minute)	5	9	0.044
Length of stay in the ED (hour)	1,7	5	<0.001
Duration time of chest pain (hour)	3	12	<0.001

## DISCUSSION

In the present study, 24.3% of patients with chest pain were diagnosed as ACS. The results of presented study are supported by literature. It is suggested that 15% of patients with chest pain are diagnosed as ACS (12) and up to 60% of patients with chest pain were not diagnosed as ACS(2).

It was found that most of the patients (42.5%) came to ED by the ambulance of 112 Emergency Medical Services in the present study. It may be a good sign to show clinical awareness on this region about chest pain. Similar to results of this study, Schneider et al. reported that 42% of patients with chest pain came to the ED by

ambulance (13). It is found that 20.8% of patients with chest pain used ambulance services for coming to the ED in a study(14). Ozen et al. suggested that only 24.9% of patients with ACS came to the ED by ambulance(15).

This study showed that 43.1% of patients were diagnosed as non-specific chest pain. Similarly, it is suggested that the patients with chest pain were identified as non-specific chest pain by nearly 40%- 60% in literature (16, 17).

It is known that chest pain can be an indicator of different diseases such as presented study. The gastrointestinal diseases, pulmonary diseases, musculoskeletal diseases and vascular diseases can give rise to chest pain (18). The fast and true differential diagnosis is essential made by emergency physicians. 110 (33.8%) of 325 patients who admitted to the ED with a complaint of chest pain were consulted with cardiologists. The consultation rate of patients with chest pain was low. It may be a significant indicator for good differential diagnosis on the role of ED physicians in management of chest pain.

The older age and male gender are consistent risk factors of ACS. In several studies, both of them found to be related with ACS(10, 19-21). Similarly, the significant association between ACS and older age was presented in this study.

Although the severity and duration time of chest pain cannot be an indicator of ACS, the type

of pain is found to be related with ACS. Similarly, to the knowledge of literature, compressive, burning and squeezing types of chest pain were known associated with ACS such as reported in this study(12).

The length of stay in the ED was found shorter in ACS+ group than ACS- group. Namely, the transport of ACS+ patients from the ED was faster in ACS+ group than ACS – group. It may show that the ACS patients don't waste time in the ED. It provides decreased mortality in terms of early management of ACS. There are many various protocols such as chest pain units for early management of ACS on the aim of reducing mortality rates (4, 8). The first step of these protocols always begins diagnosis stage in the ED by emergency physicians(22).

## CONCLUSION

Chest pain is an important complaint that needs rapid and true diagnosis in the ED. The older age, male gender and compressive, burning types of chest pain can be related with ACS. Particularly, the quick transport for percutaneous transluminal coronary angioplasty (PTCA) or other therapies on ACS patients provides reduction in mortality rates. Thus, the emergency physicians should done effective differential diagnosis for the patients with chest pain.

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