

Brief Report

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Do Patients with Chest Pain Benefit from Installing Triage System in Emergency Department?

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Abstract

Introduction: Chest pain, which can be cardiac or non-cardiac and either benign or life-threatening, needs appropriate diagnosis and treatment in emergency department (ED).

Objective: The aim of this study was to compare delivery time of primary care for patients with chest pain before and after applying triage system in ED.

Methods: Medical records were reviewed of thirty patients (group one) with chief complaint of chest pain who referred to ED between April and July 2008 (before installing triage system) and thirty-five patients (group two) with the same chief complaint who referred between August and September 2009 (after installing triage system). Time between patients' arrival and beginning of diagnostic and therapeutic interventions including cardiac monitoring, first physician visit time, intravenous line insertion, and electrocardiogram performance were compared between the two groups.

Results: Based on the findings, the mean age and sex ratio of studied patients in the two groups were not significantly different ($p>0.05$). Door to ECG performance, Door to intravenous line insertion, and Door to cardiac monitoring were significantly shorter in post triage installing period than previously ($p<0.001$). Door to first visit by physician was not statistically different in the two study periods ($p=0.421$).

Conclusion: It is likely that patients with chest pain who referred to ED benefit from installing triage system in terms of performing some nursing care including ECG performance, starting cardiac monitoring, and IV insertion.

Key words: Chest pain; Emergency service, hospital; Patient care management; Triage

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INTRODUCTION

Triage is a system of prioritizing available resources to provide suitable care for patients who refer to Emergency Department (ED) (1, 2). By ED triage, we can manage time and resource allocation in a better way to maximize efficacy of available supplies. In this way, critical patients can be visited and treated faster than stable ones. Installing accurate triage system in overcrowded EDs is an essential task to reduce waiting time and treatment delays (3). A standard triage system includes four criteria: all patients should meet triage system; a skilled health professional (physician or nurse) should prioritize patients; triage should be done in one to three minutes; triage should be done according to patient's vital signs, chief complaints and health professional's assessment (4-6). Emergency Severity Index (ESI) is a five-step evaluation system developed in 1990 that helps a user to apply acuity level by assessing vital signs. This system identifies resources needed for each patient; it is inclusive and can be

taught in little time, and the more system scoring, the less critical the situation (7, 8).

Chest pain, which can be cardiac or non-cardiac and either benign or life-threatening, needs appropriate diagnosis and treatment. Chest pain is the second most prevalent complaint of patients referring to ED, which records six million visits every year (9). Almost 4.6% of patients with acute myocardial infarction and 6.4% of patients with unstable angina have been misdiagnosed in ED in Canada (10). Evaluation of prior cardiac history, patient's level of function and compatibility, initial 12-lead ECG, and a single set of cardiac enzymes are primary assessments of patients with chest pain. According to ESI evaluation, patients with chest pain are in level 2 of triage system and should get principal health services such as intravenous (IV) line insertion, electrocardiogram (ECG), and cardiac monitoring within ten minutes (11-13). Since 2008, triage system has been carried out in Imam Khomeini Hospital Complex,

affiliated to Tehran University of Medical Sciences, Tehran, Iran. Before applying this system, patients visited based on arrival time and not on clinical condition so the most critical cases waited for a long time to be attended to and to receive essential services. The aim of this study was to compare delivery time of primary care for patients with chest pain before and after applying triage system in ED.

METHODS

This was a cross-sectional study conducted in Imam Khomeini Hospital Complex, Tehran, Iran. The study protocol was approved by the ethical committee of Tehran University of Medical Sciences. The authors were committed to maintaining the principles of secrecy.

Thirty patients (group one) with chief complaint of chest pain who referred to the ED between April and July 2008 (before installing triage system) and 35 patients (group two) with the same chief complaint who referred between August and September 2009 (after installing triage system) were randomly included. Medical records available in their files were reviewed and the pre-prepared checklist was fulfilled. Time between ED arrival and beginning of diagnostic and therapeutic interventions including cardiac monitoring, first physician visit, IV line insertion, and ECG performance were recorded and compared between the two groups. SPSS version 16 was used for data analysis. Data are presented as mean \pm SDs. Independent sample *t* test was applied for comparing. P-value less than 0.05 considered as significant level.

RESULTS

The re-checked variables are presented in Table 1. Based on the findings, the mean age and sex ratio of studied patients in the two groups were not significantly different ($p>0.05$).

Door to ECG performance, Door to intravenous line insertion, and Door to cardiac monitoring were significantly shorter in post-triage installing period than previously ($p<0.001$).

Door to first visit by physician was not statistically different in the two study periods ($p=0.421$).

DISCUSSION

Based on the findings, after installing the triage system in the evaluated ED, the time from patient arrival to ECG performance, IV insertion, and starting cardiac monitoring has decreased. It can be claimed that correct triage application can save limited resources and time whereas incorrect triage system will result in wasting time and energy, and also patient displeasure (14, 15). Reliable and valid triage assignments may lead to better allocation and health care for ED patients. This instrument is reliable, valid and easy-to-use in the ED (16, 17).

As an important and considerable finding, the first visit by the physician after patient arrival to the ED did not differ significantly between the two groups, which may show that patients with chest pain had been considered as critical cases who should be visited in a short time by a physician; or, on the other hand, the triage failed to effect door to visit time period. More research is still needed to perform in this regard.

Limitations

Considering the patients' outcome regarding the primary care given to each one before and after installing triage, this brief study would have benefited from important data that were not collected in this regard.

CONCLUSIONS

It is likely that the patients with chest pain who referred to ED benefitted from installed triage system through receiving some nursing care including ECG performance, starting cardiac monitoring, and IV insertion.

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AUTHORS' CONTRIBUTION

All the authors met the standards of authorship based on the recommendations of the International Committee of Medical Journal Editors.

Table 1: The studied variables in patients' file reviewed in two study period

Variables	Group one	Group two	P value
Sex (Female/Male)	(12/18)	(12/23)	0.746
Age (mean \pm SD)	62.08 \pm 27.31	63.06 \pm 31.64	0.374
Door to electrocardiogram performance (min)	23.17 \pm 11.9	13.6 \pm 2.7	<0.001
Door to intravenous line insertion (min)	49.8 \pm 20.9	18.3 \pm 7.06	<0.001
Door to cardiac monitoring (min)	49.8 \pm 20.9	18.3 \pm 7.06	<0.001
Door to first visit by physician (min)	21.67 \pm 10.19	18.3 \pm 7.06	0.421

CONFLICT OF INTEREST

None declared.

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