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Does rapid blood sampling affect the retention time of patients with low-acuity complaints in the emergency department?

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ABSTRACT

Introduction: The objective of this study was to investigate whether rapid blood sampling during triage led to shorter stays in the emergency department for patients with low-acuity complaints.

Methods: A retrospective study was conducted in the emergency department (ED) of a tertiary university hospital in South Korea. A pre- and post-intervention comparison analysis was completed over one-month periods in June and September 2014. Data included triage level of the patient, time from the ED visit to receiving the doctor's orders, result time of complete blood cell count (CBC) and blood chemistry (BC), length of stay (LOS) for all discharged patients who required blood sampling.

Results: A total of 1308 patients were reviewed for June 2014, and 1530 patients were reviewed for September 2014. The time from the order to the CBC and BC result report differed significantly between the two groups ($p < 0.001$). Rapid blood sampling did not affect the LOS in the ED ($p = 0.339$).

Conclusion: Rapid blood sampling performed immediately after triage was not effective for shortening the LOS of discharged patients with low acuity complaints who required blood sampling. But the LOS of ED patients who were referred to the internal medicine was reduced by more than 200 min.

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1. Introduction

Overcrowding in emergency departments (EDs) is a central issue in the United States and many other parts of the world, including some Asian countries [4,7,14]. ED overcrowding is the result of various factors which are an overall increase in patient volume, lack of beds for patients admitted to the hospital, shortage of nursing staff, prolonged length of stay (LOS), delays in service provided by radiology, laboratory, and ancillary services [6,8]. Emergency department LOS is perceived as an important component of ED overcrowding [3,9]. According to Rodi et al. [13], LOS is an important determinant of patient satisfaction in the ED, with longer stays associated with decreased satisfaction with emergency care.

In South Korea, a major cause of ED overcrowding is that large proportions of patients presenting to EDs have low-acuity complaints [Canadian Triage and Acuity scale (CTAS) category IV/V]

[17]. According to Lee et al. [11], the percentage of inappropriate use of ED in tertiary university hospital was higher than the lower level hospital. This inappropriate use of ED in tertiary university hospital by patients with low-acuity complaints is considered the main cause of ED overcrowding [1,2,10]. For these reasons, most of the cubicles in ED are used for patients waiting for admission, even urgent patients often receive treatment without a cubicle. In addition, recent studies have focused on finding a reasonable way to relieve overcrowding, such as eliminating unnecessary procedures through a re-consideration of the ED system [5,15,16]. According to Nawar et al. [12], diagnostic and screening services are provided at 71.1% of ED visits and 34% of patients undergo blood tests. In this study, the order of blood sampling for patients classified as CTAS categories III, IV and V was changed. The patient's blood sample is collected by ED nurse immediately after triage and send to the central laboratory for complete blood cell count (CBC) and blood chemistry (BC).

The aim of this study was to determine the effectiveness of the rapid blood sampling immediately after triage for patients with low-acuity complaints and to determine whether this method assists to resolve ED overcrowding.

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2. Methods

2.1. ED characteristics

This ED is visited by more than 65,000 patients annually, has a high proportion of patients with long term conditions and has 43 cubicles, including a resuscitation room and a trauma resuscitation room. The ED is divided into specific areas for critical patients, non-urgent patients and pediatric patients.

Our ED has used the CTAS for triage since May 2008 for all patients admitted for treatment. Team triage was used at the same time. The ED used the CTAS (5-step classification system: level I resuscitation, level II emergency, level III urgent, level IV less urgent, level V non urgent). The distribution of admitted patients by severity level in 2013 was as follows: level I 1%, level II 3%, level III 52%, level IV 32%, level V 12%. Patients with severity levels III–V accounted for 96% of all attendances.

2.2. Triage

In pre-intervention periods, ED patients were triaged by the team. The triage team consisted of an assessment nurse, an emergency physician, and an intern. Patient was assessed by triage team

at the same time, and then the emergency physician prescribed the required tests for patients' disposition and medication orders. The interns describe the brief medical records. Patients with low-acuity complaints were evaluated and moved back to the waiting room for laboratory or radiological tests or for discharge.

The intervention involved adding an emergency nurse who has more experience in blood samples to the existing triage team. The table for an emergency nurse who has more experience in blood samples located near the triage room and was able to take blood samples for testing without delay (Fig 1).

In the post-intervention periods, patients who required blood sampling with low-acuity complaints moved to the sampling zone and the sampling nurse takes blood samples without delay after triage.

A pre- and post-intervention comparison analysis was completed for one month in June 2014 and one month in September 2014. Pediatric patients, patients who did not require blood sampling, patients admitted to another hospital department and revisiting patients were excluded. We also excluded patients who had CTAS category I or II. All remaining adult CTAS III, IV, and V patients were included in the study.

All data were extracted from the electronic medical record and electronic ED tracking systems. We collected patient demographic

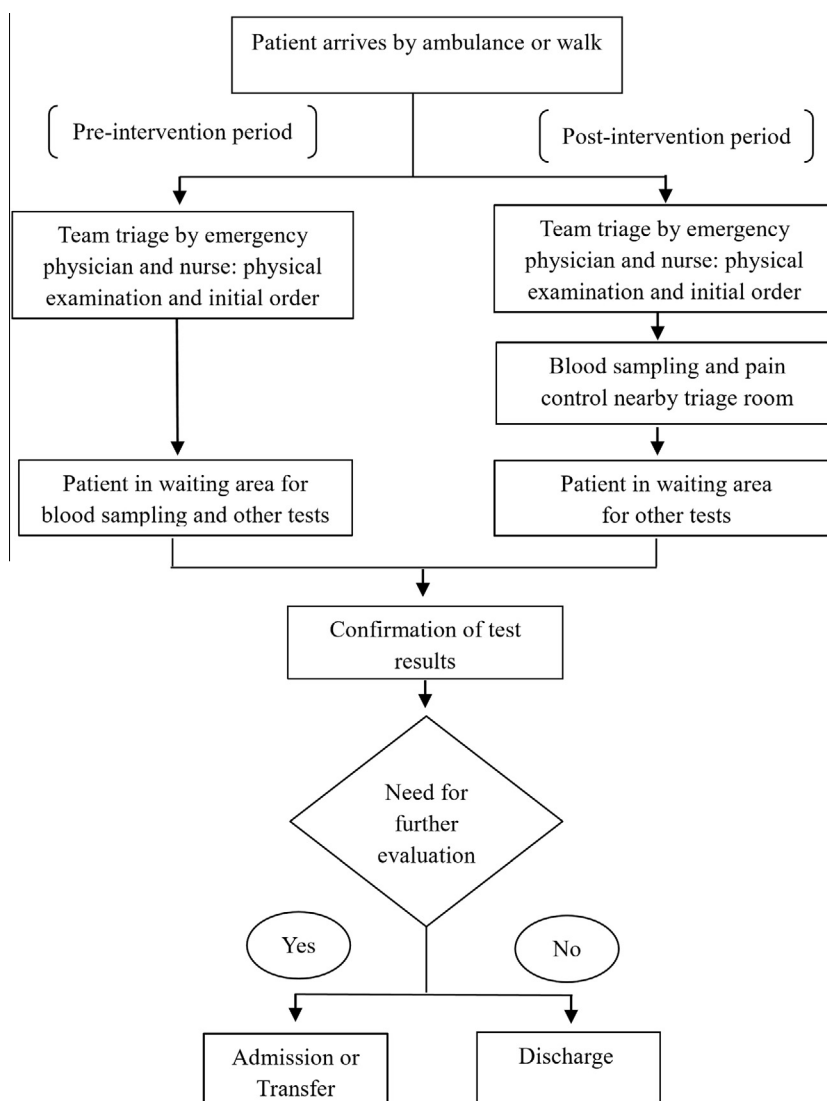


Fig. 1. Pre- and post-intervention patient flow chart.

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