

Clinical outcome of multidisciplinary patients hospitalized with the decision of emergency physicians

Hospitalization decision by emergency physicians

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Abstract

Aim: In this study, we aimed to compare clinical outcomes of multidisciplinary patients who were admitted by the decision of emergency physicians (EPs) with that of patients, who were admitted after the consensus decision of consultant physicians in terms of number of consultation, emergency department (ED) and hospital length of stay (LOS), need for intensive care unit (ICU), transfer status after hospitalization and outcome.

Material and Methods: This was a retrospective observational study. The multidisciplinary medical patients who were above 18 years of age and need hospitalization were included. The patients were divided into two groups: Group I consisted of those who were hospitalized by the decision of EPs, and Group II consisted of patients who were hospitalized after a consensus reached between consulting physicians. Mann-Whitney U test and Chi-square tests were used for comparisons.

Results: Of the 1143 hospitalized patients, 204 (17.85%) were in Group I and 939 (82.15%) were in Group II. Group I patients needed more consultations in the ED, had higher ED-LOS, need more ICU, and were more commonly transferred to other departments after hospitalization. As the number of consultations increases, the ED-LOS increases accordingly in both groups. Although Group I patients seem to be more commonly transferred ($p = 0.001$), overall hospital-LOS between the two groups was similar ($p = 0.143$). The transferred patients in Group I had a higher hospital-LOS compared to non-transferred patients ($p = 0.001$).

Discussion: The authorization of EPs to hospitalize multidisciplinary patients to the most related department seems to be feasible because overall hospital-LOS does not change.

Keywords

Emergency Department, Consultation, Multidisciplinary Patient, Hospitalization

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Introduction

Emergency departments (EDs) play a major role in all hospitalizations in the United States [1]. ED admission increases by an average of 1.8% per year worldwide, making ED crowding a growing problem and significantly increasing ED length of stay (ED-LOS) [2]. Immediately after patients reach EDs, they are involved in a chain of processes such as triage, registration, diagnosis, treatment, consultation, and hospitalization. During these processes, some problems are experienced including long waiting times, insufficient bed capacity, and the fact that patients who require a multidisciplinary approach are not primarily admitted by other specialists or consultants [3,4]. An important aspect of emergency medicine is the consultation process. Need for admission to a ward or intensive care unit (ICU), getting an expert opinion, providing treatment or a specific procedure, exclusion of specific diagnosis, transfer of care, and outpatient follow-up are the main reasons for ED consultation [5,6]. During the consultation process, consultant physicians should admit, take care and follow the patients during hospitalization for an efficient functioning system [3,7,8]. In Turkey, emergency medical care is free of charge, and the simplest route to a hospital bed is through EDs. During an ED shift, patients requiring a multidisciplinary approach are consulted by multiple specialist physicians. When a consensus is reached between the consultant physicians for the hospitalization of a patient, the consultant physician takes responsibility for the patient care [9]. In many circumstances, because of patient rights regulation and malpractice lawsuits, physicians hesitate to hospitalize this difficult patient group. In 2009, the Turkish Ministry of Health declared the following policy: ED patient follow-up should not exceed 24 hours. Within this period, patients with an unestablished diagnosis, or patients with an indication for admission but whose clinical state is related to more than one specialty, are reevaluated, and admission decisions to a hospital bed of the most appropriate specialty should be made by the attending emergency physician (EP) or hospital administrative specialist (HAS), and the related specialty consultant should be notified. The responsibility for follow-up, care, and treatment of the patient belongs to the related specialty consultants. In practice, this means that if consultants do not take care of the patients that are at risk for adverse clinical outcomes, the EP makes the decision of admission to the related specialty by giving them primary care of the patient. Then patient is transferred to the related specialty unit, out of the ED. If the patient care is served by general practitioners, as in secondary level hospitals, this decision is made by the HAS from other specialties. Consultation processes of the patients continue during the time they are hospitalized in these units, and the follow-up and treatment responsibility of some patients may be transferred to another specialty unit. Although this process often causes controversy among medical disciplines, it relieves the stressful working conditions of EPs. To our knowledge, this study is the second in the literature regarding the applicability of this policy.

The aim of this study is to compare the clinical outcome of multidisciplinary patients who were admitted with the decision of EPs with that of patients, who were admitted with the consensus decision of consultant physicians in terms of number

of consultation, ED and hospital-LOS, need for ICU, transfer status after hospitalization and outcome.

Material and Methods

This was a retrospective observational study. The local institutional ethics committee approved the study (2020/75). This study was conducted at the ED of a tertiary care research and training hospital between January 1 and December 31, 2019. This ED serves approximately 150,000 patients annually, and the overall hospitalization rate is around 5-10%. The patients who were above 18 years of age and needed hospitalization, consulted to two or more specialties were included in the study. Exclusion criteria were patients <18 years of age, all discharged patients from ED, patients hospitalized by surgical departments, patients who needed only one consultation, and patients whose data were not reached. Patients who died in the ED during diagnostic work-up before an admission decision were also excluded because these patients were shown as 'discharged from ED' in the hospital database system.

Data regarding number of consultations in the ED, ED-LOS (minutes), hospital-LOS (days) were automatically derived from the hospital database management system by the database staff. Data regarding age, gender, need for ICU, transfer status between departments after hospitalization, and the outcome (discharge or death) were collected by reviewing all patient records and ED patient charts by two EPs. The patients were divided into two groups. The first group (Group I) consisted of those who were hospitalized by the decision of EPs, and the second group (Group II) consisted of patients who were hospitalized after a consensus reached between consulting physicians.

Statistical Analysis

Data were analyzed with Statistical Package for the Social Sciences (SPSS) version 23.0 (IBM Corp. Armonk, NY, USA). Normality distribution was examined with Kolmogorov-Smirnov or Shapiro-Wilk tests. The Mann-Whitney U test was used in the comparison of data that were not normally distributed. Data that were not normally distributed were shown as median and interquartile range (IQR). The Chi-square test was used in the comparison of categorical data. Categorical data were shown as number and frequency (percentage). The significance level was $p < 0.05$.

Results

During the study period, 133100 patients presented to the ED, and 9497 (7.13%) patients were hospitalized. After excluding patients according to the exclusion criteria, 1143 (0.86%) hospitalized patients who were consulted to two or more medical specialties in the ED were included. Of the 1143 patients, 204 (17.85%) were hospitalized by the decision of EPs (Group I) and 939 (82.15%) were hospitalized by the consensus decision of consulting physicians (Group II) (Figure 1).

Comparison of these two groups according to age, gender, number of consultations, ED-LOS, hospital-LOS, need for ICU, outcome, transfer status after hospitalization are shown in Table 1. The patients who were hospitalized by the decision of EPs were older, need more consultations in the ED, have higher ED-LOS, need more ICU care and more commonly transferred

to other departments after hospitalization. As the number of consultations increases the ED-LOS increases accordingly in both groups. Patients who were admitted with the decision of EPs have higher ED-LOS. No patient died during the ED boarding time, that is the time spent from admission

Table 1. Characteristics of multidisciplinary patients admitted to the hospital

	Group I (n = 204)	Group II (n = 939)	p value
Age (IQR)	75 (18)	72 (17)	0.001
Sex (Female/Male)	106/98	450/489	0.296
Number of consultations (IQR)	3 (2)	2 (1)	0.001
ED-LOS (IQR) (min)	390.5 (337)	306 (261)	0.001
h-LOS (IQR) (day)	7 (8)	6 (8)	0.143
ICU need (n)	75 (36.76%)	190 (20.23%)	0.001
Outcome (exitus)	42 (20.59%)	151 (16.08%)	0.119
Transferred between departments	29 (14.22%)	26 (2.77%)	0.001
Number of consultations	ED-LOS (minutes)	median (IQR)	
2	345 (357)	287 (234)	
3	385 (265)	336 (337)	
4	447 (346)	363 (296)	
5	603 (479)	481 (449)	
6 ≤	839 (716)	485 (345)	

ED-LOS: Emergency department length of stay, h-LOS: Hospital length of stay, ICU: Intensive care unit, IQR: Interquartile range

Table 2. Hospital-Length of Stay of patients according to the transfer state

	Transferred (n = 29)	Not transferred (n = 26)	p value
h-LOS (day), median (IQR)	Group I 12 (16)	7 (8)	0.001
	Group II 8.5 (19)	6 (8)	0.127

h-LOS: Hospital length of stay, IQR: Interquartile range

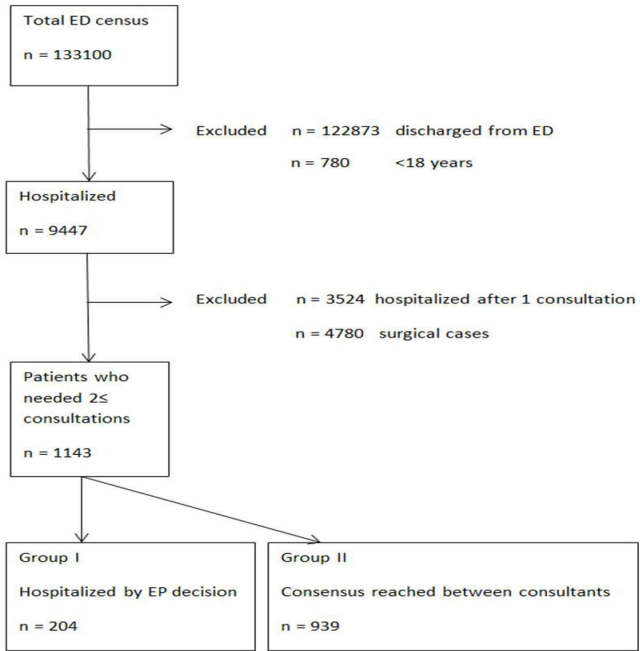


Figure 1. Patient flow diagram, ED; emergency department, EP; emergency physician

decision to location to an inpatient bed in the departments. During hospitalization, 29 of 204 (14.22%) patients in Group I and 26 of 939 (2.77%) patients in Group II were transferred to another department for care after the stabilization of the acute primary condition. Although Group I patients seems to be more commonly transferred (p = 0.001), overall h-LOS between two groups were similar (p = 0.143).The transferred patients in Group I have higher h-LOS compared to non-transferred patients (p = 0.001). The transferred patients in Group II have similar h-LOS compared to non-transferred patients (p = 0.127) (Table 2).

Distribution of 204 patients who were hospitalized with the decision of EPs, according to the departments are as following: 51 (25%) in chest diseases, 45 (22.06) in internal medicine, 31 (15.20%) in infectious diseases, 26 (12.75%) in cardiology, 18 (8.82%) in nephrology, 12 (5.88%) in gastroenterology, 9 (4.41%) in neurology, 8 (3.92%) in medical oncology, and 4 (1.96%) in hematology departments, respectively.

Discussion

Overcrowding and increased ED-LOS in EDs is one of the most critical problems facing hospitals worldwide. As the ED-LOS and boarding time from ED increase, the risk of delirium and mortality also increases [10-12]. Overcrowding occurs when the number of patients exceeds the capacity of the treatment area, leading to reduced quality of care [13]. England, Australia, Canada, and New Zealand have introduced legal regulations to reduce overcrowding in EDs. The “Four hours rule”, issued in England in 2004, requires 98% of ED patients to be discharged from the EDs after four hours of presentation. Although this ruling was controversial, the percentage of patients meeting this requirement without affecting quality has increased [14,15]. Australia passed a similar law in 2008, effectively reducing ED overcrowding and the general death rate [16,17]. In a study conducted in 2005 at a hospital in which EPs were authorized to send stable patients who needed admission directly to appropriate patient beds in the internal medicine ward, it was found that this rapid admission policy caused a decrease in the ED-LOS [18]. In the Republic of Korea, after the removal of the necessity of consultation for hospitalization to internal medicine clinics, except for specific procedures such as endoscopy and coronary angiography, it was found that hospitalization decisions by EPs reduced the ED-LOS without significant adverse effect on death or hospital length of stay [8]. During the last two decades, the condition of patients in large EDs has shifted toward more severe, more complicated, and older patients who require multiple consultations [19]. In addition to its effects on hospital-LOS and eventually overcrowding in ED, multiple consultations also have adverse effects on patient care. Although this is a common and essential aspect of emergency medicine practice, little research has been conducted on this subject. In a study conducted in Canada, a consensus of 89.3% (458/513 patients) was reached between EPs and consultants for patient outcomes [20]. In another study conducted in Japan, 95% (1153/1215 patients) consensus was reached about patient outcome [21]. In our study, conducted on hospitalized patients, this rate was found to be 82.15%

(939/1143 patients).

As the number of consultations increases, ED-LOS increases accordingly. This is similar to published literature [4,19].

In a study comparing the periods before and after the application of the Australian National Emergency Access Target in 2012, Perera et al. found that the number of transfers between departments within 48 hours increased from 0.84% to 7.1% in hospitalized patients (RR, 7.93; 95% CI, 5.98-10.51; $p < 0.001$) [22]. In the present study, this rate is found to be 14.22% (29/204). However, we think that in-hospital transfers occurred not due to misdiagnosis but due to changing clinical situations during follow-up in units or after the acute condition recovered.

The mortality is similar between the two groups ($p = 0.119$). In a small study including 57 patients from Turkey, they found no mortality, transfer after hospitalization and ICU need among patients hospitalized with EP decision [4]. In that study, 23% of the patients were hospitalized with the diagnosis of anemia. We believe that our patients were more complicated that require a multidisciplinary approach.

Limitations

The limitations of the present study are as follows: firstly, this was a retrospective study, and the patient population was reached by examining the consultation notes on the hospital electronic database. Secondly, it is a single-centered study. Thirdly, there are a limited number of studies in the literature to compare our findings. Well-designed multi-institutional observational studies are needed to further address this issue.

Conclusion

Our study is important in terms of being one of the few studies that examines the hospitalization decisions made by EPs. Difficulties in taking care of this multidisciplinary patient group by clinicians have made EPs a kind of referee or decision-maker. Authorization of EPs to hospitalize multidisciplinary patients to the most related specialty department seems to be feasible because overall hospital-LOS does not change.

Scientific Responsibility Statement

The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

Animal and human rights statement

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.

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Conflict of interest

None of the authors received any type of financial support that could be considered potential conflict of interest regarding the manuscript or its submission.

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