Reasons for Overcrowding in the Emergency Department: Experiences and Suggestions of an Education and Research Hospital

Acil Serviste Aşırı Kalabalığın Nedenleri: Bir Eğitim Araştırma Hastanesinin Deneyimleri ve Önerileri

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SUMMARY

Objectives

In this study, we aimed to determine the causes of overcrowding in the Emergency Department (ED) and make recommendations to help reduce length of stay (LOS) of patients in the ED.

Methods

We analyzed the medical data of patients admitted to our ER in a one-year period. Demographic characteristics, LOS, revisit frequency, and consultation status of the patients were determined.

Results

A total of 163,951 patients were admitted to our ED between January 1, 2013, and December 31, 2013. In this period 1,210 patients revisited the ED within 24 hours. A total of 38,579 patients had their treatment in the observation room (OR) of the ED and mean LOS was found to be 164.1 minutes. Cardiology was the most frequently consulted specialty. Mean arrival time of the consultants in ED was 64 minutes.

Conclusions

Similar to EDs in other parts of the world, prolonged length of stay in the ED, delayed laboratory and imaging tests, delay of consultants, and lack of sufficient inpatient beds are the most important causes of overcrowding in the ED. Some drastic measures must be taken to minimize errors and increase satisfaction ratio.

Key words: Consultation; emergency department; overcrowding.

ÖZET

Amaç

Bu çalışmada, acil serviste aşırı yoğunluğun nedenlerini belirlemeyi ve hastaların acil serviste kalış sürelerini azaltmaya yönelik önerilerimizi sunmayı hedefledik.

Gereç ve Yöntem

Bir yıllık sürede acil servise başvuran hastaların tıbbi bilgileri incelendi. Hastaların demografik özellikleri, kalış süreleri, tekrar başvuru sayıları ve konsültasyon durumları belirlendi.

Bulgular

1 Ocak 2013 ile 31 Aralık 2013 tarihleri arasında toplam 163951 hasta acil servise başvurdu. Bu süre içinde, 1210 hasta 24 saat içerisinde tekrar acile başvurdu. Toplam 38579 hasta tedavisini acil servisin gözlem odasında aldı ve ortalama kalış süresi 164.1 dakikaydı. En fazla konsültasyon istenen bölüm kardiyoloji idi. Konsültanların acil servise varış süresi ortalama 64 dakikaydı.

Sonuç

Dünyanın diğer bölgelerindeki acil servislere benzer şekilde, acilde aşırı yoğunluğun en önemli nedenleri acil serviste uzun kalış süresi, gecikmiş laboratuvar ve görüntüleme testleri, konsültanların gecikmesi ve yeterli hastane yatağı olmamasıdır. Hataları en aza indirmek ve memnuniyet oranını artırmak için, ilgili farklı birimlerle temas halinde, bazı sert önlemler alınmalıdır.

Anahtar sözcükler: *Konsültasyon; acil servis; aşırı yoğunluk.*

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Introduction

The Emergency Department (ED) is one of the most overcrowded units in the inpatient service delivery system. Delays in services in the ED may have unpleasant consequences for patients.[1] Crowding in the ED is defined as having more patients than treatment rooms or more patients than staff should ideally care for, and overcrowding was defined as dangerously crowded, with an extreme volume of patients in ED treatment areas which forces the ED to operate beyond its capacity.[2,3]

In the Emergency Medicine literature, overcrowding in EDs is described as a major public health problem due to degradation of the quality of care (prolonged waiting times, delays to diagnosis and treatment, delays in treating seriously ill patients), increased costs (leading to unnecessary diagnostic investigations), and patients' dissatisfaction.[4,5] Although the most important cause of bottleneck in the ED seems to be a growing population with non-urgent complaints. Overcrowding in EDs is a multi-factorial problem worldwide, occurring as a result of prolonged length of stay (LOS) in the ED, inadequate healthcare personnel appointment, delayed response to ED consultations, repeated ED visits (including inappropriate use), and hospital-specific factors (size and location, lack of available inpatient beds). In this article, we investigated ED systems of different countries and aimed to find a solution to overcrowding in the ED in the light of statistical data of Samsun Education and Research Hospital (SERH) Emergency Department. We also presented our recommendations to prevent overcrowding in the ED.

Materials and Methods

We retrospectively collected the medical data of the patients admitted to SERH Department of Emergency Medicine in a one-year period between January 1, 2013, and December 31, 2013. Data was collected using analysis of electronic medical records from the ED over a 12-month period. Besides demographical findings, annual ED admission count, seasonal distribution, number of repeated visits within 24 hours, LOS of the patients in the ED observation rooms, and period of arrival of consultants were investigated. Demographical findings of the patients were collected by reviewing the medical reports. Other information, such as consultation call time, start and finish time of the consultations, and LOS of the patients, was collected. Status was determined and compared with other facilities from the perspective of preventing overcrowding in the ED. Medical data was recorded on Statistical Package for the Social Sciences (SPSS) 15.0 programme. Data were presented as frequency. After statistical analysis, graphics were obtained using Microsoft® Office Excel Programme. Study was conducted with the permission of SERH Administration.

Results

A total of 163,951 patients were admitted to our ED in a one-year period. Of these patients, 87,549 (53.3%) were male and 76,402 (46.7%) were female. The proportion of those under the age of 18 was 16,743 (10.2%). Consultation with at least one department was required in 18.1% of the patients. Among all patients admitted to the ED, 1.3% did not have health insurance. In this period 1,210 (0.7%) patients revisited the ED within 24 hours. With 16,095 patients and 139 revisits, the month of August was the most crowded in the ED. Table 1 demonstrates the number of monthly visits, revisits, and frequencies. A total of 38,579 patients had their treatment in the observation room (OR) of the ED and mean

Table 1. Number of patients admitted to the ED and revisits monthly

Month	Number of revisits	Number of patients admitted	Ratio (%)
January	71	11688	0.61
February	106	12991	0.82
March	101	13745	0.73
April	95	12972	0.73
May	128	13508	0.95
June	85	13724	0.62
July	107	13721	0.78
August	139	16095	0.86
September	78	13454	0.58
October	85	15640	0.54
November	124	12973	0.96
December	91	13458	0.68

Table 2. Number of patients admitted to the observation room of the ED, sum and mean values of length of stay

Month	Sum of LOS of patients in the OR (min)	Number of patients admitted to the OR	Mean LOS of patients in the OR (min)
January	498049	3095	161.3
February	533510	3117	171.1
March	534309	3268	163.5
April	538887	3183	169.3
May	529759	3259	162.5
June	547410	3234	169.2
July	481559	3240	149.03
August	574824	3640	158.3
September	480047	3173	151.05
October	485056	3235	150.3
November	433373	3025	143.2
December	471949	3110	152.1

OR: Observation room; min: Minute.

LOS was 164.1 minutes. Table 2 represents the monthly admissions to OR and mean LOS of patients. The number of patients with an LOS of 12 hours was 432 (mean value was 36 per month). Cardiology was the leading department according to consultation ratios (16.4%), followed by general surgery (12.6%), neurology (8.6%), and internal medicine (8.4%). In one year, the mean period between call for consultation and arrival of the consultant was 64 minutes. Seasonal distribution of consultation periods and mean value is demonstrated in Figure 1.

Discussion

Samsun, with its population of 593,260 in the city center according to 2012 census data, is the largest city in the Karadeniz Region located in the North of Turkey. In the city, there are three main hospitals: University Hospital, Education and Research Hospital, and State Hospital. Besides. Other healthcare service providers include one obstetrics hospital, one hospital for lung disease, and a few private hospitals. Samsun Education and Research Hospital gives emergency service to 600 patients daily and 163,951 patients annually with 3 doctors per shift (a specialist, resident, and practitioner) in the ED. For comparison, in a study in Switzerland, it was reported that 57,645 patients were admitted to the ED of an urban teaching hospital in the year 2008.[6]

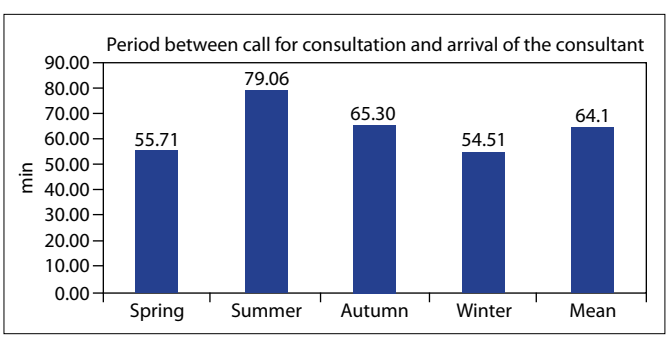

Figure 1. Seasonal distribution of periods of consultations and annual mean value.

The largest proportion of patients in our study was admitted in summer months, particularly in August. The reason of this human density in summertime may be associated with summer vacation, increasing number of outdoor activities and touristic travels, and heat strokes and suffocations related to season of sea. July of 2013 was an exception to this trend because it was the holy month of Ramadan and the number of activities tended to decrease during the day.

As in other EDs worldwide, in our country, the most common problem is overcrowding of the ED which results in dissatisfaction of both ED personnel and patients. In our opinion, people in Turkey tend to use ED frequently because of financial concerns, lack of medical insurance, and expectation of rapid service.

In fact, patients requiring vital interventions represent less than 3% of those using EDs.

Non-urgent patients' use of EDs, rather than primary care settings, allows them to be treated without an appointment in a setting with modern and high-quality technologies.

The French government implemented several measures to improve the coordination of health care services and EDs and to control the flow of ED visits.[7] Alternative health care structures, such as primary care units located near the hospitals that can take care of non-urgent patients who go by themselves to an ED or have been wrongly directed to one, were constructed. These structures helped solve the ED overcrowding problem.[8] "Inappropriate" use of emergency departments (ED) is a term used for over use of EDs in western society.[9] Inappropriate use results in not only compromised efficiency of healthcare personnel, infrastructure, and financial resources of the ED, but also in delay of treatment of serious medical conditions.[10-12] In our study, we determined that people not only over-use the ED but also contribute to overcrowding by repetitive admissions. Prolonged LOS may occur as a result of overcrowding, delay of radiological and laboratory test results, delayed and inappropriate consultations, and inadequate inpatient bed counts. Despite a relatively short LOS, it was reported in the Netherlands that almost half of the crowded EDs experienced overcrowding two or more times per week. Delays in consultations and laboratory and radiology services contributed to the problem. Admitted patients had a longer LOS because of delays in obtaining inpatient beds.[13] Another factor that affects LOS in the ED is inpatient LOS. A study in Canada revealed that prolonged LOS in the ED was associated with prolonged inpatient LOS. In that study, patient age, comorbid factor level, and sex were found to influence LOS.[14] Our study revealed that prolonged LOS, as in the EDs of other hospitals in the world, is the main cause of loss of resources and manpower in our hospital.

Consultation is an important component of ED patient care. Consultations are common and often lead to hospital admission in academic tertiary EDs. It is the process by which emergency physicians request other specialists (consultants) to participate in the care of the ED patient. By the end of this process, the consultant should provide one of the following recommendations: admit, discharge with or without consultant follow-up, or consult another specialty.[15] In our study, mean annual consultation time was found to be 64.1 minutes which is an unacceptable period, particularly in the ED. In a study, frequency and outcomes of consultations were investigated and it was reported that at least one consultation was requested in 38% of patients. More than one-half of the patients (54.3%) who received a consultation were admitted to the hospital.[16] In another study, Cortazzo et al. reported that the frequency of consultation was approximately 40% at a U.S. Army base hospital ED with 60,000 annual visits.[17] These results reveal the importance of urgent response to consultations in order to reduce overcrowding. Specialty consultation was also associated with prolonged LOS, and this effect was highly variable depending on the service consulted.[18] In our study, frequency of the consultations was found to be 18.1%, which is a relatively low proportion when compared to other studies. This may be related to a higher ratio of non-urgent patients admitted to our ED, resulting in overcrowding. We agree with Woods et al. that interventions to streamline the consultation process and rules regarding consultation times appear warranted when the current status of many hospitals are considered.[16] EDs must also be organized to transport the patients from ED to the related ward as soon as possible.

In a study from Turkey, it was determined that the most important factor for the effectiveness of consultation was the definition of the urgency of the patients by residents in the ED. It was observed that as the level of urgency of the patient increased, time of arrival of the consultant decreased.[19] These results reveal that standardization for the consultation system is essential. In a multicenter study, Cooke et al. reported that 20.5-37.9% of patients visiting four different EDs did not actually use any departmental resources except for examination and advice.

They recommended using staff with little experience or restricted in their decision by protocols to reduce the number of patients requiring only examination and advice. They also reported that 13.3-18% of patients arrived by ambulance and some of these patients may avoid attendance at hospital if paramedics were trained to deal with these cases.[20] They concluded that a large percentage of patients seen in EDs may not require the extra facilities of that department. There is potential for a large number to be discharged within a few minutes of arrival if appropriate assessment skills are available at first contact. A similar system may be applied to our ED and contribute to prevention of overcrowding and misdiagnosis of critical patients in the ED.

Conclusion

Overcrowding is a common problem in EDs worldwide. It has undesired consequences such as loss of resources, ineffective use of time, and dissatisfaction of both ED personnel and applicants. Policy makers and hospital managers must focus on measures to reduce non-urgent presentations to the ED in order to minimize possible medical inaccuracies. We believe that emphasizing PCUs, increasing the number of personnel, ensuring compliance of the consultants, and educating the public about receiving appropriate healthcare may reduce overcrowding in the ED. Collaboration between ED physicians and consultants must be constituted and maintained. A systematic approach for ambulance systems and EDs must be developed to refer patients to optimal centers where they can receive the appropriate therapy. In the future, governments must focus on and develop the family physician system to keep non-urgent patients out of EDs.

Conflict of Interest

The authors declare that there is no potential conflicts of interest.

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