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An investigation of waiting times of patients admitted to the general surgery clinic from an emergency department

Acil servisten genel cerrahi kliniğine yatırılan hastaların bekleme sürelerinin incelenmesi

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Abstract

Introduction: The study aimed to determine the waiting times of the patients admitted to the general surgery clinic from an emergency department and to investigate the effectiveness of services.

Methods: 1564 patients over the age of 18 admitted to the General Surgery Clinic from the emergency department of Health Sciences University Bursa Yuksek IhtisasTraining and Research Hospital between 01.01.2018 and 31.12.2018 were included. Age, gender, admission and waiting times, the diagnoses, and surgical history or hospitalization were retrospectively analyzed. The difference between the admission time to the emergency department and the admission time to the general surgery clinic was accepted as waiting time.

Results: 56% of the patients (n: 876) were male and the mean age was 49.9. The mean waiting time in the emergency department was 440.85 minutes and the mean hospital stay was 4.67 days. The minimum waiting time was in abdominal trauma (249.49 min) whereas the longest waiting time was in mesenteric ischemia (732.27 min) in the emergency department.

Discussion and Conclusion: We believe that having a separate and senior team in emergency services of work-intensive departments such as general surgery will contribute to shortening waiting times and providing faster and more effective health care.

Keywords: Emergency medical service; waiting time; general surgery; consultation.

Özet

Amaç: Bu çalışmanın amacı acil servise başvurup genel cerrahi kliniğine yatırılan hastaların acil serviste bekleme sürelerinin belirlenmesi ve sağlık hizmetlerinin etkinliğini araştırmaktır.

Gereç ve Yöntem: 01.01.2018 ile 31.12.2018 tarihleri arasında Sağlık Bilimleri Üniversitesi Bursa Yüksek İhtisas Eğitim ve Araştırma Hastanesi Acil Servisten Genel Cerrahi Kliniğine yatırılan 18 yaş üstü toplam 1564 hasta dahil edilmiştir. Hastaların yaş, cinsiyet, acil servise başvuru zamanları, acil serviste bekleme süreleri, hangi tanılar ile yattığı, cerrahi bir işlem geçirip geçirmediği ve yatış süreleri retrospektif olarak incelendi. Hastanın acil servise ilk başvuru saati ile genel cerrahi kliniğine yattığı saat arasındaki fark bekleme süresi olarak kabul edildi.

Bulgular: Hastaların, % 56'sı (n:876) erkek olup, ortalama yaş 49,9 olarak saptandı. Hastaların acil serviste ortalama bekleme süresi 440.85 dakika olup ortalama hastanede yatış süreleri ise 4.67 gün olarak saptanmıştır. Acil serviste hastaların tanısına göre en az bekleme süresi 249.49 dk ile batın travmaları, en uzun bekleme süresi ise 732.27 dk ile mezenter iskemi olarak saptanmıştır.

Sonuç: Genel cerrahi gibi iş yükü yoğun olan bölümlerin acil servis konsültasyonlarında ayrı ve kıdemli bir ekip bulundurmasının, bekleme sürelerinin kısalmasına, daha hızlı ve etkin bir sağlık hizmeti sağlayacağını düşünmekteyiz.

Anahtar Sözcükler: Acil servis; bekleme süresi; genel cerrahi; konsültasyon.

Emergency departments (EDs) have an important role in health care organizations globally in terms of enabling urgent medical care for cases needing immediate attention.[1] However, EDs' services may be problematic because of the high number of patients and the demanding nature of the profession. This might result in an increase in waiting times, improper treatment, wasting the economic resources, and ethical considerations.[2] The intensity of the emergency department particularly affects the quality of the health services, the satisfaction of the patients and the probability of the health workers' making mistakes.[3]

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Patients admitted to the emergency departments vary widely. These admissions may be a simple medical condition or a life-threatening condition. One of the most common complaints of patients admitted to emergency services is abdominal pain.[4] In addition, blunt or penetrating abdominal trauma are among other reasons for admission to emergency services.

In this study, the waiting times of the patients who were admitted to a general emergency clinic with abdominal pain and blunt or penetrating abdominal trauma after the physical examination, laboratory and imaging tests were evaluated.

Materials and Method

A total of 1564 patients over the age of 18 who were admitted to the General Surgery Clinic from the Emergency Department of Health Sciences University Bursa Yuksek IhtisasTraining and Research Hospital between 01.01.2018 and 31.12.2018 were included. The study was conducted retrospectively and approval was obtained from the local ethics committee (2011-KAEK-25 2019/04-07). The difference between the time of the first admission to the emergency department and the time of admission to the general surgery clinic was calculated as the waiting time. In addition, age, gender, time of admission to the emergency department, diagnosis, surgical history, and length of stay were evaluated.

Statistical Analysis

The data were analyzed using SPSS for Windows (21.0) software. All values were expressed as mean±standard deviation (SD). Data were analyzed via Student's t-test. One-way Anova test was conducted to investigate whether there was a significant difference between independent groups according to the mean. The post-hoc Tukey test was used to investigate the source of differences between the groups. Parametric variables were analyzed by Pearson test while non-parametric variables were analyzed by Spearmen test. P values <0.05 were considered significant. Results were given in the 95% confidence interval.

Results

1564 patients were included in the study. 56% of the patients (n: 876) were male and the mean age was 49.9 (min: 18, max: 95). 70.2% of the patients admitted to the emergency department on weekdays and 57.5% on 16–08 shifts. Surgical intervention was performed in 54.2% of the patients and 93.7% were discharged with healing. The mean waiting time of the patients in the emergency department was 440.85 minutes and the mean hospital stay was 4.67 days (Tables 1, 2).

The most common diagnosis was acute appendicitis (33.7%) while the lowest diagnosis was volvulus-invagination (0.6%). According to the diagnosis of patients in the emergency department, the minimum waiting time was 249.49 min. in abdominal trauma and the longest waiting time was 732.27 min in mesenteric ischemia (Table 3).

There was a significant difference between the waiting times and admission times in the emergency department (Weekdays-Weekend and Public Holidays) due to the weekdays' admissions (p<0,01 One-Way Anova and Post-Hoc Tukey Test) (Table 4).

Table 1. Demographic data

Variables	n	%
Gender		
Male	876	56.0
Female	688	44.0
Treatment type		
Surgical	847	54.2
Medical	717	45.8
The last condition		
Treatment rejection	12	0.8
Healing	1465	93.7
Exitus	49	3.1
Transfer to another section	2	0.1
Referral	6	0.4
Other	3	0.2
Discharged	27	1.7
Total	1564	100

Table 2. Mean age, waiting time and length of stay

	Age	Waiting time	Length of stay
Mean	49.9373	440.8574	4.6777
Median	49.0000	354.0000	3.0000
Std. deviation	20.26005	380.12220	5.19717
Range	78.00	7378.00	98.00
Minimum	18.00	1.00	1.00
Maximum	95.00	7379.00	99.00

There was a significant difference between waiting time in the emergency department and patient diagnoses due to abdominal trauma (p<0.01 One-Way Anova and Post-Hoc Tukey Test) (Table 5).

In the Spearman test for nonparametric correlation, there was a correlation between the duration of waiting in the emergency department and the treatment type (p=0.005), (r=0.71), and the waiting time in the emergency department and admission time (p=0.00), (r=-1.37) (Table 6).

In the Pearson test for parametric correlation, no correlation was found between the waiting time in the emergency department and the age of the patients and the duration of hospitalization.

Discussion

Length of stay is considered as a significant marker which shows the quality of services in emergency departments.[5] It was found in several studies in the literature that the number of the patients is related to the length of stay.[6] In the studies

Table 3. Mean waiting time and frequency of variables

	Frequency	Percent	Waiting time in emergencies mean (Dk)	Standard deviation
Diagnosis				
Acute appendicitis	527	33.7	432.34	301.20
Acute cholecystitis	191	12.2	472.40	369.08
Acute pancreatitis	142	9.1	487.37	389.59
Abdominal trauma	89	5.7	249.49	208.85
Abdominal-anorectal abscess	24	1.5	459.50	490.42
GIS bleeding	30	1.9	517.67	375.52
GIS malignancy	57	3.6	424.26	467.59
GIS perforation	91	5.8	384.40	226.44
Hernia	77	4.9	400.58	838.46
Ileus	146	9.3	478.38	286.06
Abdominal pain etyo-IBD	108	6.9	537.57	381.20
Mesenteric ischemia	11	0.7	732.27	469.51
Post-op complication	20	1.3	440.05	387.05
Volvulus-Invagination	9	0.6	382.56	372.91
Other	42	2.7	363.14	403.42
Admission time				
Weekdays	1098	70.2	466.86	401.39
Weekend	403	25.8	384.05	324.66
Public holiday	63	4.0	351.05	259.56
Working time				
08:00–16:00	665	42.5	429.64	412.98
16:00–08:00	899	57.5	449.15	353.86
Total	1564	100	440.85	380.12

GIS: Gastrointestinal system; IBD: Inflammatory bowel disease.

Table 4. Comparison of emergency service admission time and waiting times Tukey HSD

(I) Time of arrival	(J) Time of arrival	Mean difference (I-J)	Std. error	Sig.	95% CI
Weekdays					
Weekend	82.81103*	22.02780	0.001	31.1351	134.4870
Public holiday	115.81304*	48.99808	0.048	0.8663	230.7597
Weekend					
Weekdays	-82.81103*	22.02780	0.001	-134.4870	-31.1351
Public holiday	33.00201	51.23946	0.796	-87.2028	153.2069
Public holiday					
Weekdays	-115.81304*	48.99808	0.048	-230.7597	-0.8663
Weekend	-33.00201	51.23946	0.796	-153.2069	87.2028

*: The mean difference is significant at the 0.05 level. CI: Confidence interval.

conducted in the USA regarding the intensity of the emergency department and the waiting period of the patients in the emergency departments, the greatest problem with emergency services has been reported to be the overcrowding of patients.[7] Overcrowding in EDs is an important issue needs to be solved in terms of a shortfall in supply and resources, which may result in long waiting times and having improper treatment. A study has shown that ED visit rates and ED crowding are increasing worldwide, except in Scandinavian countries.[8] In our country, due to the prolongation of ED crowding and waiting time, the Ministry of Health has issued a circular to prevent hospitalization in elective conditions for cases longer than 4 (four) hours even if longer than 8 (eight) hours hospitalization for observation and follow-up is decided.[9]

In a study conducted in our country regarding the waiting

Table 5. Comparison of emergency waiting time and diagnosis Tukey HSD[a,b]

Tanı	N	Subset for alpha = 0.05	
		1	2
Abdominal trauma	89	249.4944	
Other	42	363.1429	
Volvulus-invagination	9	382.5556	
GIS perforation	91	384.3956	
Hernia	77	400.5844	
GIS malignancy	57	424.2632	
Acute appendicitis	527	432.3397	432.3397
Post-op complication	20	440.0500	440.0500
Abdominal-anorectal abscess	24	459.5000	459.5000
Acute cholecystitis	191	472.3979	472.3979
ileus	146	478.3836	478.3836
Acute pancreatitis	142	487.3662	487.3662
GIS bleeding	30	517.6667	517.6667
Abdominal pain etyo-IBD	108	537.5741	537.5741
Mesenteric ischemia	11		732.2727
Sig.		0.094	0.064

Means for groups in homogeneous subsets are displayed. a: Uses harmonic mean sample size=34.573. b: The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed. GIS: Gastrointestinal system; IBD: Inflammatory bowel disease.

times in the emergency departments, the mean hospitalization period was 26.5±22.3 hours in patients who needed Intensive Care Unit (ICU) and 31.2±23.3 hours in patients who did not need ICU. In this study, the mean waiting time of patients admitted to the general surgery service was found to be 19.5 hours.[10] In our study, the mean waiting time of patients admitted to the general surgery service was 440 minutes in emergencies. Although the mean waiting time was less than the other study compared, it was long in terms of the targeted time. In our study, the minimum waiting time was in abdominal trauma, while the maximum waiting time was in mesenteric ischemia. Mesenteric ischemia is relatively more difficult to diagnose than other acute abdominal pain. The fact that the findings are sometimes nonspecific, the patients are generally elderly and have co-morbid diseases may make the diagnosis difficult.[11] In addition, we think that the intensity of the emergency department, the inexperience of the general surgery consultant, and late arrival to the consultation because of being in the surgical team or providing polyclinic service at the same time are some of the reasons for long waiting time. In another study conducted in our country, it was found that the general surgery was found to have the latest arrival time for consultation. In this study, the mean response time of general surgeons to the consultation was 44:17 min.[12] In a study conducted by Dönmez et al., the duration of the consultation was investigated and it was determined that the maximum duration of the consultation was 222 minutes in thoracic surgery

Table 6. Nonparametric correlations table of variables

	Last condition	Treatment type	Diagnosis	Working time	Time of arrival service	Waiting times at the emergency
Spearman's rho						
Last condition						
Correlation coefficient	1	0.025	**0.139****	-0.021	**-0.073****	0.018
Sig. (2-tailed)	.	0.315	**0**	0.399	**0.004**	0.466
Treatment type						
Correlation coefficient	0.025	1	**0.408****	0	-0.021	**0.071****
Sig. (2-tailed)	0.315	.	**0**	0.989	0.408	**0.005**
Diagnosis						
Correlation coefficient	0.139**	**0.408****	1	0	0.025	-0.007
Sig. (2-tailed)	0	**0**	.	0.988	0.32	0.769
Working time						
Correlation coefficient	-0.021	0	0	1	**0.072****	0.016
Sig. (2-tailed)	0.399	0.989	0.988	.	**0.005**	0.521
Time of arrival						
Correlation coefficient	-.073**	-0.021	0.025	**0.072****	**1**	**-0.137****
Sig. (2-tailed)	0.004	0.408	0.32	**0.005**	.	**0**
Waiting time at the emergency service						
Correlation coefficient	0.018	**0.071****	-0.007	0.016	**-0.137****	1
Sig. (2-tailed)	0.466	**0.005**	0.769	0.521	**0**	.

**: Correlation is significant at the 0.01 level (2-tailed).

and 196 minutes in general surgery.[13] The peak hours of emergency services are usually evening hours. Especially most of the admissions are between 18: 00–24: 00.[5,14] Looking at these studies, it is normally expected that waiting times will be longer during peak hours of emergency services. However, the highest waiting period in our study was determined as 08: 00–16: 00. This finding was also statistically significant. We believe that this depends on the late consultation period. Because the consultant physicians can also be in the surgical team or they can consult not only in the emergency department but also in other departments. In a study on the treatments applied to patients admitted to the general surgery service, it was reported that 450 of 585 patients underwent surgery and 145 patients had medical treatment. In our study, 847 (54.2%) patients underwent surgery.[15] We believe that the reason for the lower rate of surgical intervention compared to the other study was because cases with cholecystitis, ileus and pancreatitis were more likely to receive medical treatment.

Limitations

As this study was conducted retrospectively, the difference between admission time to the emergency department and admission time to the general surgery clinic was calculated. However, how long the patients waited in the triage area and when the consultant physician was notified and when the consultant physician came to the emergency room could not be calculated exactly. This might affect the waiting time. Therefore, this situation may be investigated in detail in prospective studies.

As a result, crowded emergency services and long waiting times cause many problems for the quality of emergency services in developing countries. New health policies need to be developed in this regard. In addition, we believe that having a separate and senior team in emergency departments of work-intensive departments such as general surgery will contribute to shortening waiting times and providing faster and more effective health care.

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