

Geriatric patient crowding in emergency departments

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Abstract

Aim: An increase in the elderly population owing to an extended average life expectancy leads to an increase in the geriatric patient admissions to the emergency departments (EDs). The aim of this study was to investigate the intensity of geriatric patients among all admissions to the emergency department and to determine the importance of these patients in hospitalizations from the EDs.

Material and Methods: Geriatric patients aged over 65 years were retrospectively evaluated between 1 January 2017 and 31 December 2018. The patients were divided into two groups by the age: 65–79 (group I) and ≥80 years (group II). The number of days of hospitalization and mortality in the intensive care units (ICUs) and clinics were examined.

Results: Of 386.670 patients aged over 18 years who were admitted to the ED, 17% (n=65.907) were aged ≥65 years. 64.4% of the patients who were hospitalized in the ICU from the ED were aged ≥65 years. The sex distribution of the patients who were admitted to but died in the ED in both the groups was as follows: Of 62.1% (n=72) in Group II were females, and of 62.1% (n=82) in Group I were males.

Conclusion: In parallel with the increase in the number of geriatric patients in ED, there is a crowding in both clinics and ICUs. This article highlights the importance of geriatric patients in emergency department admissions and their importance in hospitalizations. Hospitalization and mortality rates increase with age.

Keywords: Emergency department; crowding; geriatric patients.

INTRODUCTION

The elderly population is swelling up day-by-day, parallel to the prolongation of the mean life expectancy (1). In fact, it is expected that the elderly population will swell to three times of the present-day population between 2015 and 2050 (2). Consecutively, the numbers of geriatric patients who are admitted to the emergency departments (EDs) have started to increase (3). EDs are already stretched and crowded due to admissions of patients of all ages. Several studies have shown that the proportion of geriatric patients admitted to the EDs varies between 9% and 19%, and these patients are known to be admitted to the EDs with more severe clinical conditions, compared to the younger ones (4). Geriatric patients are exposed to many detailed examinations when they are admitted to EDs, extending their waiting hours. Moreover, in this group of patients, post-discharge medical complications and decreased quality of life are quite frequent, and serious

costs have arisen due to all these factors (5). Owing to the difficulties in determining therapeutic and prognostic aspects in patients with multiple diseases, need of new healthcare services is emerging. The common causes of admission of the elderly in the EDs, include ischemic heart disease, congestive heart failure, syncope, cardiac dysrhythmias, acute cerebrovascular events, pneumonia, abdominal discomfort, urinary tract infections and injuries related with falls (6).

Our aim in this study was to investigate the intensity of geriatric patients among all admissions to the emergency department and to determine the importance of these patients in hospitalizations from the emergency department.

MATERIAL and METHODS

This study was approved by the Medical Board of Expertise of the Samsun Training and Research Hospital

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(Date 22.01.2019, No. 2019/02). A total of 65.907 geriatric patients (≥65 years), who were admitted to the ED between 1 January 2017 and 31 December 2018, were retrospectively evaluated. Patients were divided into two groups according to the age: patients aged 65–79 years (Group I) and patients aged ≥80 years (group II). Group I and II were compared in terms of hospitalized and discharged patients. Furthermore, the groups were examined separately in terms of hospitalisation in clinics or intensive care units (ICUs) and the duration of hospitalization. These patients were divided according to the clinical results of 'discharge', 'death' and 'referral to an external center' in the clinics where they were hospitalized. The most common causes of hospitalization and death in patients aged ≥65 years were investigated. Our hospital had 515 clinic beds, 95 ICU beds, a level 3 surgical ICU and internal medicine ICU, level 2 neurology ICU, level 1 emergency ICU, a general ICU and coronary ICU, at the time of the study.

Statistical analysis

After the data obtained from the study were encoded, they were analyzed using the SPSS (version 22 for Windows, SPSS Inc., Chicago, IL, USA) package programmer. Continuous variables were expressed as mean ± standard deviation (SD), and frequency data were expressed as number and percentage (%). Conformity to normal distribution of the variables in statistical analyses was performed using the Kolmogorov–Smirnov test. The Chi-square test was used to compare the data obtained by counting. Continuous variables were evaluated using the Mann–Whitney U-test, because they did not conform to normal distribution. A p value <0.05 was considered statistically significant.

RESULTS

Of the 386.670 patients aged over 18 years, admitted to the ED, 17% (n=65.907) were aged ≥65 years. Of these geriatric admissions, 73% (n=48.252) were categorized age-wise as group I and 27% (n=17.657) as group II (Figure 1).

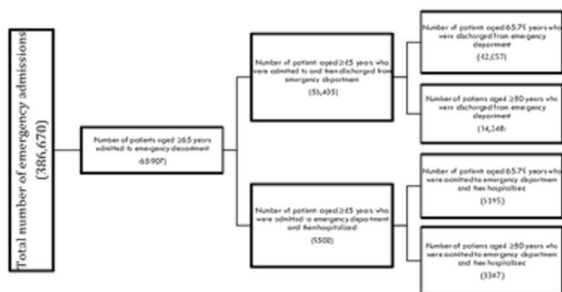


Figure 1. The distribution of patients admitted to the emergency department

Further, 54% (n=35.701) of the geriatric patients were females. Furthermore, in Group II, 59.3% (n=1.453) were females and 40.7% (n=997) were males, and there was

a statistically significant difference between the groups in terms of sex distribution (p=0.001). Moreover, 67.7% (n=5.134) of the patients in Group I and 32.3% (n=2.450) of those in group II were hospitalized and then discharged, and the difference was statistically significant (p=0.001).

Of the total hospitalizations of the patients aged ≥18 years, 64.4% aged ≥65 years were hospitalized in the ICUs, and 46.3% aged ≥65 years were hospitalized in the clinics (Table 1).

Table 1. Rates of hospitalisation in clinics and intensive care units of patients admitted to emergency department

	18–64 years	Group I	Group II	Total (Group I+Group II)
Hospitalisation in intensive care unit	1.056 (35.6%)*	1.122 (37.9%)	784 (26.5%)	1.906 (64.4%)*
Hospitalisation in clinic	8.826 (53.7%)*	5.073 (30.9%)	2.523 (15.4%)	7.596 (46.3%)*
Total	9.882 (50.9%)*	6.195 (32%)	3.307 (17.1%)	9.502 (49.1%)*

(*Row percentage)

There was a statistically significant difference between group I and II in terms of duration of hospitalization in the neurosurgery clinic (p=0.009), otorhinolaryngology clinic (p=0.046), orthopaedics clinic (p=0.006) and palliative care clinic (p=0.014). There was no significant difference in terms of duration of hospitalization between Group I and Group II patients who were admitted to other ICU from emergency department (p>0.05).

Moreover, there was a statistically significant difference between group I and II in terms of duration of hospitalization in the general ICU (p=0.026) and patients in group I stayed longer in the general ICU than patients in group II. There was no significant difference in terms of duration of hospitalization between Group I and Group II patients who were admitted to other ICI from emergency department (p>0.05).

Patients who died during the admission and observation periods in the ED were evaluated in terms of age and sex, and it was found that 62.1% (n=72) of the patients in Group II who died were females and 62.1% (n=82) of the patients in group I who died were males. There was a statistically significant difference in terms of sex between the patients who died in Group I and II (p<0.001).

Patients who were hospitalized, but died, were evaluated in terms of sex and age. It was found that 54.1% (n=165) of the patients in Group II who died were females and 45.9% (n=140) were males, and that 58% (n=177) of the patients in group I who died were males and 42% (n=128) were females. There was a statistically significant difference between Groups I and II in terms of sex (p = 0.004).

The mortality rates of the patients hospitalized in clinics were 2.8% (n=139) and 5.9% (n=147) in group I and II, respectively. Moreover, the mortality rates of the patients hospitalized in ICUs in group I and group II were 54.6% (n=606) and 70.5% (n=545), respectively (Table 2).

Table 2. Evaluation of hospitalisation periods and clinical outcomes of geriatric patients hospitalised in clinics and intensive care units

		Group I		Group II		P
		n(%)*	Number of days of hospitalisation (Mean±SD)	n(%)*	Number of days of hospitalisation (Mean±SD)	
Patients hospitalised in clinics	Discharged	4.752 (96.3%)	7.8±12.8	2.313 (93.6%)	8.4±11.6	<0.001
	Ex	139 (2.8%)	23.0±39.7	147 (5.9%)	23.0±36.8	0.821
	Referral to an external centre	39 (0.9%)	6.9±8.8	11 (0.5%)	10.2±18.6	0.412
Patients hospitalised in intensive care units	Discharged	477 (43%)	6.5±22.8	217 (28%)	12.1±29.7	<0.001
	Ex	606 (54.6%)	18.3±33.2	545 (70.5%)	15.7±23.0	0.755
	Referral to an external centre	25 (2.4%)	11.0±14.6	11 (1.5%)	13.5±23.3	0.892

*Column percentage

Patients who were hospitalized in the ICUs and clinics, and later discharged, were evaluated in terms of duration of hospitalization, and it was found that patients in Group II were hospitalized longer than patients in group I ($p<0.001$).

Of the patients who were referred to an external center from the ED, 57.9% ($n=1.072$) were of group I and 56% ($n=600$) of these patients were males. There was a statistically significant difference between the groups in terms of sex ($p=0.001$).

It was found that 17.082 (25.9%) patients aged ≥ 65 years were admitted to the ED in summer, 16.858 (25.5%) in winter, 16.517 (25%) in spring and 15.450 (23.6%) in autumn. Moreover, cardiovascular diseases were most frequently encountered in spring (28.5%) and the diseases of internal medicine (26%), chest diseases (34%) and neurologic diseases in winter (27%).

It was observed that 10.8% ($n=7.145$) of the geriatric ED admissions were due to trauma, and 75.5% of these patients ($n=5.390$) were from group I. Of the patients hospitalized in clinics due to trauma, 9% ($n=484$) were from Group I and 16% ($n=277$) from Group II. Likewise, of the patients hospitalized in the ICUs due to trauma, 0.9% ($n=48$) were from group I and 2.5% ($n=44$) from group II. Furthermore, it was found that the admissions of geriatric patients due to trauma were most frequent in summer (31.7%, $n=2.262$) and the distribution of admissions of geriatric patients due to trauma in different seasons was as follows: 25.3% ($n=1.806$) in autumn, 22.6% ($n=1.617$) in spring and 20.4% ($n=1.447$) in winter.

DISCUSSION

Patients aged over 65 years are the fastest growing proportion of the normal population and constitute 10%–15% of the ED admissions. They stay longer in the EDs and are more exposed to laboratory and radiologic examinations than the younger patients are. Despite a more comprehensive evaluation, they have a higher rate of misdiagnosis and comorbidity and mortality than the younger patients. Elderly patients are hospitalized more often and are often treated in hospitals. (3,6,7). Covino

et al. Found that patients aged > 85 years were more complex cases, presented more often with red color code, and were hospitalized more frequently. 65-84 age group was accepted more often with the yellow color code, and then discharged from the emergency service stated. (6). When group 1 and group 2 patients were compared in our study, both hospitalization and mortality rates of group 2 patients were higher than Group 1 (Table 2). We think that this is due to the increase in co-morbid diseases that increase with age. These rates vary according to the location and population characteristics of the country, city and ED (1,2). With the increasing number the elderly population in Turkey, the use of health services is affected by this situation (7,8). Satar et al. showed that 12.3% of the total number of ED admissions comprised the geriatric-aged patients, and 59.35% of these patients had to be hospitalised (8). Unsal et al. showed that the rate of patients over 60 years of age who admitted to the ED was 13% and 78.3% of the elderly patients who were admitted to ED were treated without hospitalisation, and 21.2% were hospitalised (9). In our study, 85.6% of the patients aged ≥ 65 years who were admitted to ED were treated without hospitalisation and 14.4% of the patients were hospitalized. Kılıçaslan et al. reported that 18.9% of the patients were admitted to the ED for geriatric patients ((10). Nur N et al. in a study evaluating ED admissions for geriatric patients; They found 55.1% of the applicants aged 65-74, 36.6% between the ages of 75-84 and 8.4% for 85 years and older (11). On an average, geriatric patients stay in the EDs 20% longer than the younger people stay and receive 50% more laboratory and imaging services. Although geriatric acute care is focused on the EDs, geriatric patients leave the EDs without satisfaction (12). In our study, 17% of the total number of ED admissions was from the geriatric age group.

The patients who died during ED evaluations were examined, and it was found that most of the dying patients aged ≥ 80 years were females, and that most of the dying patients aged 65–79 years were males (12). Unsal et al. showed that 78.3% of the elderly patients who were admitted to ED were treated without hospitalization, and 21.2% were hospitalized (9). In our study, 85.6% of the

patients aged ≥ 65 years who were admitted to ED were treated without hospitalization and 14.4% of the patients were hospitalised.

In our study, the rate of hospitalization (64.4%) in ICUs was quite high. The relationship between the clinical results (discharge, death and referral to an external center) in the clinics where they were hospitalized and duration of hospitalization were examined in group I and II. We found that the patients in Group II were hospitalized for longer durations and that the mortality rate in group II was higher than in group I. The discharge rate in patients in Group I was higher than in group II (Table 2).

Hogan et al. stated that geriatric EDs became widespread in the United States since 2008, and that gaining a certain standardization of geriatric EDs, as like the pediatric EDs, enabled the geriatric patients to be evaluated in appropriate conditions. Moreover, the EDs were unique in the development of care of geriatric populations. EDs, which are at an easily accessible locations, are the places where the 'hospitalization' or 'discharge from hospital' decision is made (13). Logoglu et al. showed that patients aged ≥ 65 years who were discharged from the EDs were found to have an average of 162.7 minutes and the patients who were hospitalised were found to have an average of 220.6 minutes of stay in the EDs. In addition that cardiology, internal medicine, chest diseases, neurology and general surgery were the clinics where the patients were most frequently hospitalized (14). In the study performed by Kekec et al., internal medicine, neurology, coronary and general surgery clinics were where the patients were most frequently hospitalized, as in our study (15). Saritas et al. highlighted the importance of evaluating whether the present symptoms were due to an exacerbation of comorbid disease or due to a new disease, although it is often confusing for physicians in the ED to evaluate geriatric patients with comorbid diseases (16). Karaveli et al. showed that the first and second most common seasons in which patients aged ≥ 65 years were admitted to the ED and hospitalized were winter and spring, respectively, and cardiology was the clinic where patients were most frequently hospitalized (17). Baz et al. showed that autumn and winter were the most common seasons and summer was the least common season in which patients were admitted to the ED and hospitalized (18). In our study, admissions to the ED of patients aged ≥ 65 years were found to be most frequent in the summer, winter, spring and autumn, in a descending order. Patients were mostly diagnosed as having diseases regarding internal medicine, chest and neurology in winter and diseases mostly related with cardiology in the spring.

Today, there are many different cut-off values as age limits for geriatric trauma. The Eastern Association for the Surgery of Trauma guidance suggests ≥ 65 years as a cut-off value for the geriatric age group (19) and the London Major Trauma System suggests ≥ 70 years as a cut-off value (20). Gulalp et al. defined geriatric patients as patients aged ≥ 65 years and reported that 18.3% of

the ED admissions were due to falls and trauma (21). In our study, 10.8% of the admissions were due to falls and trauma, and 75.5% of these patients belonged to group I. Hung et al. divided geriatric patients as patients aged 55–70 years and ≥ 70 years in their 10-year, single-centered cohort study. They showed that patients aged 55–70 years were hospitalised more frequently in the ICUs due to trauma than patients aged ≥ 70 years (22). In our study, of the patients hospitalised in clinics due to trauma, 9% belonged to Group I and 16% to Group II, and of those hospitalized in the ICUs due to trauma, 0.9% belonged to group I and 2.5% to group II. Moreover, the geriatric admissions due to trauma were most frequent in summer (31.7%) and least frequent in winter (20.4%).

CONCLUSION

In parallel with the increase in geriatric patient crowding in the EDs, there is an increased crowding in both clinics and the ICUs. This article highlights the importance of geriatric patients in ED admissions and their importance in hospitalizations. Hospitalization and mortality rates increase with age. We believe that making the necessary arrangements in terms of health policies related to this patient group will contribute to the ED crowd.

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