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Investigation of the relationship between emergency department applications and prognoses of geriatric patients

Seyda Tuba Savrun, Atakan Savrun

Ordu University Faculty of Medicine, Department of Emergency Medicine, Ordu, Türkiye

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Abstract

The World Health Organization (WHO) stated that the elderly population constituted 12% of the population of people over 60 years old in 2015. In the coming years, by 2030, 1 out of 6 people in the world will be 60 years or older, and this ratio will increase to 22% in 2050. In addition, it is estimated that the proportion of the elderly population will be 11.0% in 2025, 12.9% in 2030, 16.3% in 2040, 22.6% in 2060 and 25.6% in 2080. The number of admissions to the emergency services of geriatric patients, the hospital treatment process, and even the mortality and morbidity rates increase in elderly patients. In this direction, it was aimed to retrospectively analyze the data of patients over 65 who applied to a tertiary hospital emergency department and determine the factors affecting the mortality of geriatric patients. The presented study is a cross-sectional and retrospective study. All patients over the age of 65 who applied to the emergency department of Ordu University Medical Faculty Training and Research Hospital between 01 July 2022 and 31 2022 were retrospectively analyzed. Demographic features of the cases, the way they applied to the emergency room (112 Emergency Service Ambulance, others: with their own vehicle, by taxi, etc.), the last diagnosis in the emergency department (neurological, cardiovascular, respiratory, metabolic, trauma and others), treatment methods (outpatient, inpatient, intensive care), their motility and the relationship of these data with each other were examined. Between the specified dates, a total of 28459 patients over the age of 18 were admitted to the emergency department. It was determined that 10.16% (n=2894) of these patients consisted of patients over 65 years of age. The relationship between the treatment modalities and mortality according to the way the patients came to the hospital was found to be statistically significant ($p<0.005$). The relationship between hospitalization, treatment modalities and mortality was statistically significant according to the clinical diagnosis of the cases ($p<0.005$). In the presented study, it was determined that the mortality of patients who applied to the emergency department due to metabolic problems and who used the ambulance system as a referral tool was high. In fact, the prognosis of geriatric patients who apply to the emergency department for any reason, especially by using the emergency ambulance system, is worse than those who do not use the emergency ambulance system. For this reason, the use of an emergency ambulance system alone affects the prognosis negatively and it is necessary to evaluate such geriatric patients more carefully.

Keywords: Geriatrics, mortality, emergency ambulance system, prognosis, metabolic problems

Introduction

“Aging”, “old age” and “senility” are concepts that are frequently used and confused in the fields of gerontology and geriatrics. “Old age”, on the other hand, is defined as the dictionary meaning of being old and showing the effects of increased excess. Due to new

developments in health and technology, both life expectancy and life expectancy of people have increased. It has been reported that the population aged 65 and over in Turkey is 7 million 953 thousand 555 people in 2020, and its ratio in the total population is 9.5%. In addition, it is estimated that the proportion of the elderly population will be 11.0% in 2025, 12.9% in 2030, 16.3%

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Corresponding Author: Atakan Savrun, Ordu University Faculty of Medicine, Department of Emergency Medicine, Ordu, Türkiye
Email: atakan4601@hotmail.com

in 2040, 22.6% in 2060 and 25.6% in 2080 [1,2].

In the elderly; many physiopathological conditions can occur that negatively affect the person due to aging such as regression in physical and mental levels, decrease in the potential to establish balance, decrease in adaptation to changing environmental conditions, weakening of the immune system, delay in wound healing. For these reasons, the number of admissions to the emergency services of geriatric patients, the treatment process in the hospital and even the mortality and morbidity rates increase in elderly patients [3].

Due to the aging of the population in our country, it becomes more important to identify the problems of elderly patients and to produce solutions to increase the quality of life and reduce mortality. In this direction, it was aimed to retrospectively analyze the data of patients over 65 years of age who applied to a tertiary hospital emergency department and to determine the factors affecting the mortality of geriatric patients.

Material and Methods

The presented study is a cross-sectional and retrospective study. The emergency department, where the study was conducted, is a tertiary emergency department with approximately 180.000 patients over the age of 18 years old and approximately 10% of these patients are geriatric patients. All patients over the age of 65 who applied to the emergency department of Ordu University Medical Faculty Training and Research Hospital between 01 July 2022 and 31 August 2022 were retrospectively analyzed. Demographic features of the cases, the way they applied to the emergency room (112 Emergency Service Ambulance, others: with their own vehicle, by taxi, etc.), the last diagnosis in the emergency department (neurological, cardiovascular, respiratory, metabolic, trauma and others), treatment methods (out patient, inpatient, intensive care), their motility and the relationship of these data with each other were examined.

Inclusion criteria

All patients over the age of 65 who applied to the emergency department of Ordu University Medical Faculty Training and Research Hospital between 01 July 2022 and 31 August 2022 will be included in the study. Cases whose information could be accessed and whose information was not missing were included in the study.

Exclusion criteria

Cases younger than 65 years, Cases admitted to the emergency department as arrest, Applications other than the first application of cases with recurrent applications on the same day, Cases whose information cannot be reached or with incomplete information will be excluded from the study.

Statistical Analysis

A package program called SPSS (IBM SPSS Statistics 28) was used. Descriptive statistics for continuous variables; Mean, Standard Deviation (SD), Minimum and Maximum.

While it was expressed as values, it was expressed as numbers and percentages for categorical variables. Chi-square test was used to determine the relationship between categorical variables. Student T test was used to determine the difference between the medians of non-homogeneously distributed continuous variables. In our present study, a p value less than 0.05 was considered statistically significant.

Results

Between the specified dates, a total of 28459 patients over the age of 18 were admitted to the emergency department. It was determined that 10.16% (n=2894) of these patients consisted of patients over 65 years of age. 9 of these cases were excluded from the study because of cardiopulmonary arrest in the emergency department, 62 cases were referred to an external center and patient information could not be accessed, 212 cases were excluded due to recurrent admissions in the same day such as dressing, injection, prescribing, and 585 cases were excluded because hospital information could not be reached. The remaining 2026 cases in total were included in the study. It was determined that 43% (n=872) of the cases were male and 57% (n=1154) were female. The age range of the cases was determined as minimum 4/year, maximum 99/year, and mean age 74 ± 12 /year. When the way of admission of the cases to the hospital was examined; those arriving by 112 emergency ambulance were 26.8% (n=542), others (with their own vehicle, taxi, etc.): 73.2% (n=1484). The relationship between the forms of treatment and mortality according to the way the patients came to the hospital is shown in Table 1. According to the clinical diagnoses of the cases, the relationship between hospital admissions, treatment modalities and mortality is shown in Table 2.

Table 1. The relationship between the forms of treatment and mortality of elderly patients according to the way they came to the hospital

	Treatment			Mortality		Total	P
	Out Patient	Inpatient	Intensive Care	No	Yes		
Ambulance	277	153	112	472	70	542	<0.001
	51.10%	28.20%	20.70%	87.10%	12.90%	100.00%	
Others	1324	134	26	1457	27	1484	<0.001
	89.20%	9.00%	1.80%	98.20%	1.80%	100.00%	

Table 2. The relationship between the forms of hospital admission, treatment modalities and mortality in elderly patients according to their clinical diagnoses and forms

	Treatment			Mortality		Way_of_arrival		P	Total
	Out Patient	Inpatient	Intensive Care	No	Yes	Ambulanc	Others		
Neurological	125	56	17	182	16	110	83	<0.001	198
	63.10%	28.30%	8.60%	91.90%	8.10%	55.60%	44.40%		100.00%
	120	24	55	184	15	83	116	<0.001	199
Cardiovascula	60.30%	12.10%	27.60%	92.50%	7.50%	41.70%	58.30%		100.00%
	240	60	32	305	27	119	213	<0.001	332
Respiratory	72.30%	18.10%	9.60%	91.90%	8.10%	35.80%	64.20%		100,00%
	188	116	30	297	37	160	174	<0.001	334
Metabolic	56.30%	34.70%	9.00%	88.90%	11.10%	47.90%	52.10%		100.00%
	123	31	4	157	1	40	118	<0.001	158
Trauma	77.80%	19.60%	2.50%	99.40%	0.60%	25.30%	74.70%		100.00%
	805	0	0	804	1	30	775	<0.001	805
Others	100.00%	0.00%	0.00%	99.90%	0.10%	3.70%	96.30%		100.00%

Discussion

In line with the source information obtained, it has been reported that the admission rate of geriatric patients to the emergency department is increasing gradually in our country and in the world. It has been reported that 15% of the patients admitted to the emergency department are geriatric patients and this rate will increase over time [4]. In another source, it was reported that geriatric cases admitted to the emergency department were between 11.5% and 50% [5]. Ünsal et al. reported that this rate was 13% in their study [6]. In the present study, the rate of geriatric cases admitted to the emergency department was found to be 10.16%. As the reason for the different rates; we think that it depends on the country, city, ethnic factors, the culture of that region, the population characteristics and the equipment of the hospitals. Geriatric patients can come to the emergency department with different application tools. While some of the cases apply by their own means, some cases use the emergency ambulance system. There are studies in the literature stating that cases over the age of 65 use the emergency ambulance at different rates. In the study conducted by Ozsaker et al., they reported that 20% of geriatric patients used the emergency ambulance system [7]. In another study, they reported that 25% of them used the emergency ambulance system [8]. In another study conducted in our country, this rate was found to be 54.1%. In addition, a study reported that 76.3% of geriatric patients were discharged from the emergency department after being treated as an outpatient [7]. In different studies conducted in our country,

they reported this rate to be 78.3% and 71.4%, respectively [6,9]. In the present study, the rate of using the emergency ambulance system in geriatric cases was found to be 26.8%. In addition, it was determined that 51.1% of the cases using the emergency ambulance system were treated as outpatients, while 89.2% of the cases who came to the emergency department with other methods were treated as outpatients. In the presented study, it was determined that the patients using the emergency ambulance system had a significantly higher rate of hospitalization and intensive care admissions than the patients who came to the emergency room by other methods. Similarly, the mortality rates of the cases using the emergency ambulance system were found to be statistically significantly higher than the cases arriving by other methods. This showed that patients using ambulances in geriatric patients had worse disease status and prognosis compared to patients using other methods. In this respect, we believe that more care should be taken when evaluating geriatric patients who apply using the emergency ambulance system.

There are many factors that affect the general health status of elderly patients, the way of applying to the hospital, the way of treating, and their mortality. These include cognitive impairment, dementia, delirium, depression, polypharmacy, incontinence, malnutrition, sarcopenia, falls, gait disturbances, pressure sores, sleep disorders, fragility levels. Depending on these factors, geriatric patients develop different clinical pictures and apply to hospital emergency services. These include neurological, cardiovascular, respiratory, metabolic

(liquid-electrolyte disorders, anemia, acute kidney failure, gastrointestinal bleeding and palliative care purposes) trauma [10]. In a study conducted in our country, they reported that, in order of frequency, geriatric patients admitted to the emergency department had cardiac causes, gastrointestinal problems, and respiratory system problems [9]. Similarly, in the study of Ross et al., it was reported that geriatric patients applied to the emergency department most frequently with cardiac symptoms [11]. Ozsaker et al. reported that the most common causes were respiratory system problems, gastrointestinal system problems, cardiovascular system problems and trauma, respectively [7]. In another study, he reported the causes as neurological, oncological and cardiological causes, respectively [12,13].

In the present study, the most common causes of geriatric patients admitted to the emergency department were found to be metabolic, respiratory and cardiological problems, respectively. In addition, among the geriatric patients who applied to the emergency department, the patients with metabolic problems were admitted to the service at the highest rate. It was determined that the patients with the highest number of cardiovascular problems were admitted to the intensive care unit. While metabolic causes such as fluid-electrolyte disorders, anemia, and acute renal failure can be followed up mostly in the ward, it is thought that patients with cardiac problems (such as acute coronary syndrome, congestive heart failure and aortic dissection) are admitted to the intensive care unit because they are risky patients. It was determined that the patients with metabolic problems had the highest mortality among geriatric patients. Trauma patients had the lowest mortality rate. We believe that the prognosis worsens in geriatric patients when metabolic causes are usually accompanied by comorbid diseases and combined with physiopathological adverse changes. In addition, the low mortality in trauma patients can be attributed to the fact that most of the trauma patients in the center where the study was conducted were simple falls, presented as an outpatient and could be treated as an outpatient. In addition, it is thought that the low mortality rate of geriatric patients presenting with respiratory problems in the presented study may be due to the fact that geriatric patients were worried about covid-19 and applied to the emergency service even with all kinds of simple respiratory symptoms at the time of the study.

It was determined that the group that used the emergency ambulance the most at the time of admission to the emergency department was the patients with neurological symptoms. This may be attributed to the fact that neurological cases deteriorate both the general condition and the state of consciousness more than those who apply for other reasons, and this situation leads the relatives of the patients to go to the hospital by emergency ambulance more. It was found that the mortality of the cases who applied to the emergency department using an emergency ambulance was statistically significantly higher. For this reason, we believe that patients arriving by emergency ambulance should be evaluated more carefully. While there is no significant relationship between mortality and gender, mortality increases

with age. We believe that the prognosis worsens with advancing age in individuals over 65 years of age, regardless of gender, when comorbid diseases, multiple drug use, possible malignancies are combined with physiopathological adverse changes.

Conclusion

In the present study, it was determined that the mortality of patients who applied to the emergency department due to metabolic problems and used the ambulance system as a referral tool was high. Therefore, the use of the emergency ambulance system alone affects the prognosis negatively and such geriatric patients should be evaluated more carefully.

Limitation

The most important limitation of the presented study is that it is a retrospective study, it is single-centered, and the number of cases is low.

Conflict of interests

The authors declare that there is no conflict of interest in the study.

Financial Disclosure

The authors declare that they have received no financial support for the study.

Ethical approval

Ethics Committee Approval dated 28.04.2022 and numbered 9/15 was obtained from the Health Sciences University Antalya Training and Research Hospital Clinical Research Ethics Committee for the study.

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