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Research Article

Evaluation of Geriatric Patients Hospitalized After Admission to the Emergency Service: The Example of Northern Syria

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Abstract

Objectives: The aim was to project to evaluate the reasons for admission, diagnosis, demographic data, risk scores, and death rates of geriatric patients to the emergency department (ED) in Northern Syria.

Methods: Geriatric patients aged 65 and over who were admitted to the ED of hospitals and hospitalized between January 1, 2022, and March 31, 2022, were included in the study. The reasons for the patient's admission to the ED were evaluated as the ten most common diagnoses for their problems.

Results: A total of 354 patients were included in the study. In the study, the most common cerebrovascular accident (15.8%), heart failure (13.6%), and myocardial infarction (7.6%) were observed. The three most common reasons for admission to the ED were found to be shortness of breath (18.6%), clouding of consciousness (10.5%), and chest pain (8.5%).

Conclusion: The study is the first geriatric population study conducted in Northern Syria after the war. When these results are evaluated, it is thought that giving more importance to cerebrovascular disease and cardiac problems of elderly patients in the ED, and making rapid diagnosis and treatment interventions can significantly reduce morbidity and mortality in this region.

Keywords: Geriatric patient, Emergency medicine, Northern Syria

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Aging is defined as the decline of physiological functions over time. It is a normal, predictable, and irreversible process that eventually leads to the death of various organ systems.[1] Chronologically, the population aged 65 years and older are considered elderly.[2] Life expectancy is increasing worldwide.[3] In 2021, 9.7% of the Turkish population is 65 years and older, and this rate is expected to reach 11% in 2025 and 12.9% in 2030.[4] As average life expectancy continues to increase, and indirectly, the number of elderly continues to increase, this will be reflected in an increase in the percentage of geriatric patients admitted to the emergency department (ED). Knowledge of the characteristics of geriatric patients admitted to the ED may influence treatment approach and diagnosis.[5] Lack of knowledge and experience in managing elderly patients, underlying diseases of the elderly, multiple drug use, and age-related physiologic changes make rapid diagnosis and treatment difficult, which is the responsibility of emergency physicians.[3, 6] Therefore, geriatric patients should be considered a special population. It is important to identify critical patients in the ED and to initiate effective and rapid treatment for this patient group. For this purpose, scoring

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systems have been developed to determine the severity of patients, and their risks are calculated based on physiological and laboratory values.[7, 8] The increasing number of geriatric patients admitted to the ED is inevitable in countries where there is war or civil unrest and problems with regular health care. In regions where post-war unrest continues, such as northern Syria, attempts are made to address most of the problems of this patient group in a palliative manner through emergency services. There is no study in the literature about the hospitalization of geriatric patients over 65 years old from the ED in northern Syria after the civil war. In this study, it was aimed to determine the reasons for admission, frequency, demographic data, risk scoring, and mortality rates of geriatric patients hospitalized after admission to the ED in Northern Syria. This study can help determine the treatment approach and guide the planning and delivery of health services.

Methods

The Ethics Committee of Hatay Mustafa Kemal University Clinical Research granted approval for this study by decision dated June 30, 2022 and number 03. Geriatric patients aged 65 years and older who presented and were hospitalized in the EDs of Çobanbey, Afrin, Elbab, Jarablus, Rasulayn, Azez, and Mare hospitals between January 1, 2022, and March 31, 2022, were included in the study. The distribution of patients admitted to the ED and included in the study by age is summarized in Fig. 1. Because computer records could not be kept, patients' information was retrospectively reviewed from hospital records and analyzed in terms of gender, age, complaints at admission, diagnosis, and hospitalization in the ward or intensive care unit. In the literature, the geriatric population is divided into three groups according to age. These people are youngest-old between the ages of 65 and 74, middle-old between the ages of 75 and 84, and oldest-old over the age of 85.[9, 10] Therefore, we sought to examine clinical differences among patients aged 65 years or older who visited the ED and were classified as youngest-old (Group 1), middle-old (Group 2), or oldest-old (Group 3) patients according to age. Patients' complaints at the time of presentation to the ED were classified as the ten most common complaints. The causes for patients' presentation to the ED were classified as the ten most common diagnoses for their problems. For patients with comorbidities and/or multiple diagnoses, the disease at presentation was recorded as the diagnosis at presentation.

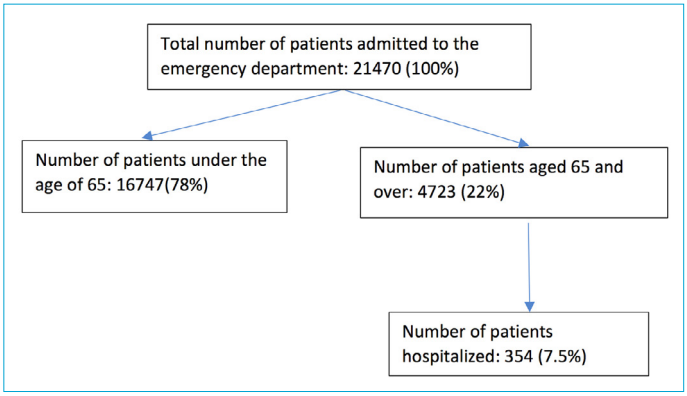

Figure 1. Distribution of patients admitted to the emergency department by age groups; n (%).

Place of Study

Turkey has opened hospitals and provided consultation services in northern Syria as part of its humanitarian assistance. Syrian doctors, nurses, and other healthcare professionals work in these hospitals and provide health-care services to the local population in northern Syria. The study was conducted in the hospitals of Afrin, Jarablus, Al-Bab, Azaz Watan, Cobanbey, Marea, and Ras al-Ayn. The geography and population served by these hospitals are unique.

Afrin Hospital: Afrin, which is located near Idlib, Aleppo, Azaz, and Turkey, has a growing population due to heavy migration and is approaching 600,000 residents. People earn their living in agriculture, industry, and trade. Regular and irregular camps affect population density. Together with Idlib, it is one of the most populous cities in northwestern Syria. Afrin Hospital, originally intended as a trauma hospital for terrorism in the region, was restored after the region stabilized. Today, it is open to the public as a 100-bed center.[11]

Jarablus Hospital: The hospital started its services in 2016. It is located in the city center of Jarablus, near the border town of Karkamış in Gaziantep. Jarablus is located just west of the Euphrates River, close to the Turkish border. Transportation between the city and other centers is problematic. People in the region live off agriculture and livestock and live in partial isolation as they do not have easy access to other towns.[11]

Al-Bab Hospital: The population of Al-Bab city is about 400,000, located south of Jarablus, Cobanbey, and Mare'a, where commerce and industry are located.[11]

Azaz Vatan, Cobanbey, and Marea Hospitals: Azaz is located 42 km south of the Turkish border province of Kilis. It has about 300 thousand inhabitants who are in tent cities and urban life. The working life in Azaz is concentrated on trade and industry. Azaz Watan Hospital is a 186-bed hospital located in the west of Azaz city. In addition to general intensive care units, there is also a specialized intensive care unit for COVID-19. Routine laboratory tests can be performed at the hospital. Computed tomography (CT), X-ray, and ultrasound (USG) imaging are available.[11] Çobanbey Hospital

has located 5 km from the border with Kilis Province. Mare Hospital is located 25 km from the border with Kilis Province. Çobanbey and Marea Hospitals have similar features and facilities to Azaz Vatan Hospital.[12]

Rasulayn Hospital is located 20 km south of Şanlıurfa, 20 km from the Turkish border. It serves about 30 thousand people. It has a capacity of about 184 beds. Routine laboratory tests can be performed at the hospital. CT, X-ray, and USG imaging are available.[13, 14]

Statistical Analysis

Statistical analyses of the study were performed using the Statistical Package for the Social Sciences version 28.0 software for Windows (IBM SPSS Statistics for Windows, Version 28.0. Armonk, NY: IBM Corp., USA). Normality assumptions were made using Kolmogorov–Smirnov and Shapiro–Wilk tests. Descriptive statistics of the variables are given as mean±standard deviation, median (min-max), and n(%). For the univariate analysis of the variables in the study, Chi-Square test, Fisher Freeman Halton Exact Test, Mann–Whitney U, or Kruskal–Wallis test were used according to the type of variable and the fulfillment of the assumptions. Paired comparisons of groups with significant differences as a result of the Kruskal–Wallis test were made using Mann–Whitney U-test and evaluated by applying Bonferroni correction (0.05/group number).

Results

A total of 354 patients participated in the study. Descriptive statistics and group comparisons of demographic findings and clinical characteristics by age group are shown in Table 1. According to the results, the relationship between the distributions of gender by age groups was not statistically significant (p>0.05). The relationship between vital signs and age groups was also not statistically significant (p>0.05).

Descriptive statistics and group comparisons of presenting complaints are given in Table 2. The relationship between the complaints and age groups was not statistically significant (p>0.05).

The distribution of patients' diagnoses according to age groups is given in Table 3. According to these results, the relationship between diagnoses and age groups was not statistically significant (p>0.05).

Mortality rates of the patients according to gender and age groups are given in Table 4. The relationship between gender and mortality is not statistically significant (p>0.05). The relationship between age groups and mortality is not statistically significant (p>0.05).

The hospitalization status of the patients according to gender and age groups are given in Table 5. According to these results, the relationship between the hospitalization status

Table 1. Comparison of demographic findings and clinical features according to groups

	Total, n (%) n = 354 (100.0)	**Group 1 (65-74 years old) n =180 (52.8)**	**Group 2 (75-84 years old) n =122 (34.5)**	**Group 3 (over 85 years old) n =52 (14.7)**	**p**
Gender, n (%)					
Male	170 (48.0)	90 (50.0)	52 (42.6)	28 (53.8)	0.299*
Woman	184 (52.0)	90 (50.0)	70 (57.4)	24 (46.2)	
Vital signs	**Mean±SD Median (Min-Max)**				
Systolic BP (mm/Hg)	128.57±28.83	128.01±27.56	130.67±30.66	125.55±28.89	
	130.0 (54.0-224.0)	130.0 (54.0-20.0)	130.0 (70.0-224.0)	120.0 (70.0-200.0)	0.745#
Diastolic BP (mm/Hg)	74.53±16.19	74.15±15.12	75.73±16.57	73.07±18.81	
	71.0 (33.0-136.0)	71.5 (33.0-120.0)	71.5 (40.0-125.0)	70.5 (41.0-136.0)	0.735#
Pulse (beats/min)	89.26±18.66	89.51±19.09	89.63±17.48	87.55±20.05	
	88.0 (42.0-170.0)	88.0 (42.0-168.0)	87.5 (57.0-150.0)	86.5 (53.0-170.0)	0.676#
Fever (°C)	36.62±0.52	36.63±0.54	36.58±0.44	36.70±0.63	
	36.6 (35.0-39.7)	36.5 (35.0-39.0)	36.6 (36.0-38.0)	36.6 (36.0-39.7)	0.719#
Respiratory rate (beats/min)	19.83±7.54	19.92±8.05	19.38±7.04	20.61±6.89	
	18.0 (6.0-46.0)	18.0 (6.0-42.0)	18.0 (6.0-46.0)	19.5 (8.0-40.0)	0.291#
Saturation	93.97±6.05	94.06±6.67	94.47±4.77	92.48±6.38	
	95.5 (50.0-100.0)	96.0 (50.0-100.0)	95.0 (65.0-100.0)	93.0 (65.0-100.0)	0.054#

*: Chi-Square Test, #: Kruskal Wallis Test.

Table 2. Distribution of admission complaints by age groups (10 most common complaints)

Admission complaints	Total, n (%) n = 354 (100.0)	Group 1 (65-74 years old) n =180 (52.8)	Group 2 (75-84 years old) n =122 (34.5)	Group 3 (over 85 years old) n =52 (14.7)	p*
1. Shortness of Breath	66 (18.6)	37 (20.6)	22 (18.0)	7 (13.5)	0.106
2. Blurring of Consciousness	37 (10.5)	16 (8.9)	17 (13.9)	4 (7.7)	
3. Chest Pain	30 (8.5)	15 (8.3)	6 (4.9)	9 (17.3)	
4. Weakness	30 (8.5)	13 (7.2)	10 (8.2)	7 (13.5)	
5. Diffuse General Edema	24 (6.8)	13 (7.2)	8 (6.6)	3 (5.8)	
6. Abdominal Pain	22 (6.2)	16 (8.9)	4 (3.3)	2 (3.8)	
7. Nausea	21 (5.9)	9 (5.0)	11 (9.0)	1 (1.9)	
8. Headaches	9 (2.5)	4 (2.2)	2 (1.6)	3 (5.8)	
9. Syncope	9 (2.5)	1 (0.6)	3 (2.5)	5 (9.6)	
10. Flutter	8 (2.3)	5 (2.8)	3 (2.5)	0 (0.0)	
11. Others	98 (27.6)	51 (28.3)	36 (29.5)	11 (21.1)	

*: Fisher Freeman Halton Exact Test.

Table 3. Distribution of diagnoses by age groups

Diagnosis	Total, n (%) n = 354 (100.0)	Group 1 (65-74 years old) n =180 (52.8)	Group 2 (75-84 years old) n =122 (34.5)	Group 3 (over 85 years old) n =52 (14.7)	p*
1.Svo	56 (15.8)	25 (13.9)	24 (19.7)	7 (13.5)	0.597
2. Heart Failure	48 (13.6)	20 (11.1)	20 (16.4)	8 (15.4)	
3. Myocardial infarction	27 (7.6)	14 (7.8)	5 (4.1)	8 (15.4)	
4. Anemia	26 (7.3)	13 (7.2)	8 (6.6)	5 (9.6)	
5. COPD	19 (5.4)	11 (6.1)	6 (4.9)	2 (3.8)	
6. Pneumonia	18 (5.1)	10 (5.6)	4 (3.3)	4 (7.7)	
7. Chronic Kidney Disease	16 (4.5)	10 (5.6)	3 (2.5)	3 (5.8)	
8. Hypertension	10 (2.8)	4 (2.2)	2 (1.6)	4 (7.7)	
9. Lung Edema	8 (2.3)	3 (1.7)	4 (3.3)	1 (1.9)	
10. Trauma	8 (2.3)	4 (2.2)	3 (2.5)	1 (1.9)	
11. Others	118 (33.3)	66 (36.6)	43 (35.2)	9 (17.3)	

*: Fisher Freeman Halton Exact Test.

Table 4. Mortality values by gender and age groups

	Alive n=307 (86.7)	Dead n=47 (13.3)	p*
Gender			
Male	146 (47.6)	24 (51.1)	0.654
Woman	161 (52.4)	23 (48.9)	
Group 1 (65-74 years old)	158 (51.5)	22 (46.8)	0.810
Group 2 (75 years and over)	105 (34.2)	17 (36.2)	
Group 3 (over 85 years old)	44 (14.3)	8 (17.0)	

*: Chi-Square Test.

of the patients and gender is not statistically significant (p>0.05). The relationship between the hospitalization status of the patients and age groups is not statistically significant (p>0.05).

Descriptive statistics and group comparisons of REMS scores according to gender and age groups are given in Table 6. According to these results, there is no significant difference between genders in terms of REMS scores (p>0.05). REMS scores increase with increasing age. The difference between age groups in terms of REMS scores is statistically significant (p<0.01). The difference between Group 1 (65–74 years) and Group 2 (75–84 years) REMS scores is statistically significant (p<0.01). The difference between Group 1 (65–74 years) and Group 3 (85 years and over) REMS scores is statistically significant (p<0.01). The difference between Group 2 (75 years and older) and Group 3 (85 years and older) REMS scores is not statistically significant (p>0.05).

Table 5. Hospitalization status by gender and age groups

	Ward n (%)	Intensive care n (%)	p*
Gender			
Male	82 (48.2)	88 (47.8)	0.939
Woman	88 (51.8)	96 (52.2)	
Group 1 (65-74 years old)	90 (52.9)	90 (48.9)	0.615
Group 2 (75 years and over)	58 (34.1)	64 (34.8)	
Group 3 (over 85 years old)	22 (12.9)	30 (16.3)	

*: Chi-Square Test.

Table 6. REMS scores by gender and age groups

	REMS Scores Mean±SD Median (Min-Max)
Gender	
Male	7.98±2.47
	8.0 (5.0-15.0)
Woman	7.75±2.67
	7.0 (5.0-20.0)
p*	0.148
Group 1 (65-74 years old)	7.42±2.66
	7.0 (5.0-20.0)
Group 2 (75 years and over)	8.21±2.33
	8.0 (6.0-16.0)
Group 3 (over 85 years old)	8.55±2.60
	8.0 (6.0-15.0)
p#	0.000
$p^{1-2,*}$	0.000
$p^{1-3,*}$	0.001
$p^{2-3,*}$	0.460

*: Mann-Whitney U, #: Kruskal Wallis Test.

Discussion

The elderly population is increasing everywhere in the world and in our country. According to the data published by the Turkish Statistical Institute, the population aged 65 and over increased by 24.0% in the past 5 years from 6 million 651 thousand 503 people in 2016 to 8 million 245 thousand 124 people in 2021. The proportion of the elderly population in the total population increased from 8.3% in 2016 to 9.7% in 2021. In 2021, 44.3% of the elderly population were men and 55.7% were women. According to population projections, 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.[4]

The increase in the elderly population leads to an increase in diseases accompanying this age group. Elderly patients are much more likely to visit the ED than the normal population and are more likely to require intensive care. It is predicted that the number of elderly patients presenting to the ED will increase in the coming years and that it will be more important to know more about this patient group.[15] There is no study in the literature that obtained similar data for northern Syria after the war. There is rapid population mobility in the region due to migration and terrorism. The inadequate number of health facilities and polyclinics in the region results in frequent visits to the ED, especially among elderly patients.

In our study, the geriatric age group accounted for 22% of ED visits. Studies conducted in Europe and America reported that ED admissions in elderly patients accounted for 11–23% of all admissions.[16-19] Considering the studies conducted in our country, the study conducted by Ünsal et al.[20] found that the rate of admission of elderly patients to the ED was 13%. However, in this study, the lower age limit for elderly patients was accepted as 60 years. In other studies, Kekeç et al.[21] reported this rate as 14.3%, Çığşar et al.[22] as 19.6%, and Bilgili et al.[15] as 10.1%. The rate of 22.2% obtained in our study was higher than in the previous studies. The proportion of elderly population has increased significantly in northern Syria due to the conflict and migration. The high number of deaths among young and middle-aged people due to war and unrest explains this proportional difference.

In the literature, Chen et al.[23] reported that dyspnea in men and abdominal pain in women were the most common reasons for admission to the ED. They also reported that admission due to accidents and trauma was more common in women. In studies conducted in Turkey, Karataş et al.[24] reported that the incidence of falls was higher in women and gender was the most important risk factor. In our study, the majority of patients admitted to the ED and treated as inpatients were also women (52%). In addition, 52.2% of patients hospitalized in the intensive care unit were female.

Considering the reasons for admission of elderly patients to the ED, diseases of the circulatory system (46.3%), diseases of the respiratory system (15.6%), diseases of the musculoskeletal system (9%), endocrine, nutritional, and metabolic diseases (6.5%) were the most common reasons for admission to the ED in the study by Çığşar et al.[22] Kekeç et al. reported that the top three reasons for ED admission were metabolic disease, cardiovascular disease, and cerebrovascular disease, respectively.[21] Hu et al.[25] listed cerebrovascular events (CVE), oncologic disease, and cardiovascular disease as the main reasons for emergency admissions. In the study by Castellà et al.,[26] the most common rea-

son for admission was diseases of the circulatory system. In the study by Bilgili et al.,[15] the most common first five reasons for admission were neurologic diseases, cardiovascular diseases, gastroenterologic diseases, respiratory system diseases, and musculoskeletal system diseases. In our study, CVE (15.8%), heart failure (13.6%), and myocardial infarction (MI) (7.6%) were the most common reasons. In the overall analysis, diseases of the cardiovascular system were the most common reason for admission. When patient subgroups were analyzed, CVE was most common in Group 1 and Group 2, while heart failure was most common in Group 3. When analyzing the study results, it can be seen that diseases of the heart and cerebrovascular system are the most common in elderly patients, but differences between regions can be observed.

When we examined the reasons for admission of elderly patients to the ED, we found that the three most common reasons for admission were shortness of breath (18.6%), confusion (10.5%), and chest pain (8.5%). In a study by Bilgili et al,[15] headache (25.1%), chest pain (15.9%), and abdominal pain (14.7%) were reported as the most common reasons for admission to the ED. In another study, Ross et al.[27] reported that the most common reason for ED admission in elderly patients was chest pain (24%).

In this study, the rate of geriatric trauma patients was lower than in other diagnostic groups. In the study of Çağlayan et al.,[28] it was shown that 14.4% of geriatric trauma patients were hospitalized. It is reasonable to assume that geriatric trauma hospitalizations are less frequent than other causes due to the high comorbidities in geriatric patients and the lower exposure to major trauma risks such as violent events and driving due to limited mobility.

Conclusion

Our study is the first geriatric population study conducted in northern Syria after the war. Evaluation of these results suggests that greater attention to cerebrovascular disease and cardiac problems in elderly patients in the ED and rapid implementation of diagnostic and therapeutic interventions could significantly reduce morbidity and mortality in the region. In summary, as the elderly population increases, the admission of elderly patients to EDs also increases. Although the reasons for ED visits in elderly patients vary in different studies, the most common reason for ED visits is usually a cardiac problem. In our study, cardiac problems (heart failure and MI) ranked first among the reasons for ED admission. This was followed by cerebrovascular disease. Therefore, we believe that conducting new studies on the prevention of cardiac disease in the ED, planning emergency services in this direction, and developing protocols and systems will play an important role in improving the quality and speed of emergency services.

Limitations

The region where the study was conducted is on the migration route due to war and internal turmoil. Therefore, the results may differ from studies to be performed at another time.

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Disclosures

Ethics Committee Approval: Institution name: Non-Interventional Clinical Trials Ethics Committee of Hatay Mustafa Kemal University Tayfur Ata Sökmen Faculty of Medicine.

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