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Prospective Analysis of Application Reasons of Alzheimer's Patients Applying to the Emergency Department

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Abstract

Background: The aim of this study is to analyze the reasons for admission of Alzheimer's patients who applied to the emergency services.

Materials and methods: The study was conducted prospectively on patients with Alzheimer's disease who applied to the emergency departments of Bursa Uludag University Health Application and Research Center, Health Sciences University Bursa Yüksek İhtisas Training and Research Hospital and Bursa City Hospital between 01.07.2021 and 01.07.2022.

Result: A total of 248 patients, 103 male (41.5%) and 145 female (58.5%), were included in the study. It was determined that the three most common diagnoses received by the patients in the emergency department were pneumonia (17.7%), ischemic cerebrovascular disease (10.3%), and urinary system infection (9.3%). It was determined that 42.7% of the patients were hospitalized in clinical and 18.1% in intensive care units.

Conclusion: As a result, it was determined that the most common diagnoses of Alzheimer's patients admitted to the emergency department were pneumonia, ischemic cerebrovascular disease and urinary tract infection, respectively and more than half of all admitted patients had indications for hospitalization.

Keywords: Alzheimer Disease, Emergency Department, Geriatric Patient.

Introduction

Alzheimer's disease (AD) is a neurodegenerative syndrome characterized by global cognitive impairment and neuropsychiatric symptoms[1]. It is the most common type of dementia and accounts for 60% to 70% of all causes of dementia[2]. Alzheimer's disease affects more than 30 million people in worldwide[3].

AD follows a clinically progressive course. It begins with forgetfulness and short-term memory loss. Over time, place, time and person orientation deteriorates. The patient, whose cognitive and motor functions are impaired, becomes immobile and in need of care over time[4]. Currently, there is no treatment that cures AD or stops its progression[5].

Emergency Departments (ED) are units where patients can quickly access medical care when needed[6]. ED applications of elderly patients with serious chronic diseases are increasing day by day[7]. AD has an important place among the patient groups[8-10]. The aim of this study is to investigate the most common reasons for admission and hospitalization processes of patients with AD and admitted to ED.

Material and Methods

An ethics committee report was obtained with the decision dated 02.06.2021 and numbered 2021-7/31 by appealing to Bursa Uludağ University Faculty of Medicine Clinical Research Ethics Committee within the scope of the master thesis. The research was conducted prospectively on patients with AD who applied to ED of Bursa Uludağ University Health Application and Research Center, University of Health Sciences Bursa Yüksek İhtisas Training and Research Hospital and Bursa City Hospital between 01.07.2021 and 01.07.2022.

Patients over the age of 18 who applied to the emergency medicine clinics of the health centers on the specified date and were previously diagnosed with AD were included in the study.The patients included in the study, or their relatives were informed and their consents were obtained. The data obtained were recorded in the patient file by the doctor who examined the patient.

The patients name, surname, date of application to the emergency department, hospital protocol number, age, gender, reason for applying to the emergency department,

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chronic diseases, how many years have been diagnosed with AD, who has been caring for the patient, number of applications to the emergency department in the last year, whether consultation is requested, patient outcome, length of stay in ED were recorded in the patient file. The interventional procedure, examination or drug administration except the routine health care was not applied to the patient.

Descriptive statics for continuous variables from the featured features are expressed as Average Standard Deviation, Minimum and Maximum values while categorical variables are expressed as numbers and percentages. Independent groups t-test was used to compare continuous variables according to categorical variables. Pearson correlation multiples were calculated to determine the relationship between these variables.

Chi-square test was used to determine the relationship between groups and categorical variables.The significance value was determined as $p<0.05$ for all analyses.Data were analyzed using the IBM SPSS (Version 21.0. Armonk, NY: IBM Corp.) program.

Results

248 applicants included in the study were evaluated according to gender in terms of age, duration of AD, duration of stay in ED and the number of ED applications in the last year (Table 1).

It was determined that 103(41.5%) of the applicants were male and 145 (58.5%) were female. The average age of 248 Alzheimer's patients participating in the study was calculated as 79.32±9.44 (Table-1).

The average time from the diagnosis of AD to the day of admission was found as 4.58±. While this period was found as 4.22±3.68 in men, it was found as 4.8±3.66 in females (Table-1).

The patient's average duration of stay in the ED was found as 7.93±5.93 hours. It was determined that female patients stayed longer in ED (Table-1).

125 patients once, 18 patients twice, 16 patients 3 times, 7 patients 4 times, 1 patient 5 times and 1 patient 6 times applied to the ED during the study period. The average number of ED applications made by the patients in the last year was found as 3.90±3.05.When the applications of men and women were compared in the last year, it was found that men applied more frequently, and this was found to be statically significant (p=0.02)(Table-1).

According to the age groups of the patients who applied to ED; they were grouped as 65-74 young old, 76-84 old, 85 and over very old and it was showed in Table-2. The number of young old people was 50(20.1%), the number of old people was 125(50.4%) and the number of very old people was 64(25.8%). It was determined that 9 patients were under 65 years of age. The average of ED admissions in the last year were compared according to the age groups. As seen in Table-2, the frequency of applying to ED was found to increase with increasing age (p=0.05).

Table 1: Analysis of Patient's age, duration of Alzheimer's Disease, duration of staying in the Emergency Department and Emergency Service applications made in the last year according to the gender of the patients.

		Number	Mean	Standard Deviation	Min.	Max	p-Value
Age	Male	102	78.64	6.709	65	93	0.339
	Female	145	79.81	10.960	40	99	
	Total	247	79.32	9.440	40	99	
Duration of AD (year)	Male	103	4.22	3.686	1	15	0.203
	Female	145	4.83	3.665	1	20	
	Total	248	4.58	3.679	1	20	
Duration of stay in ED (hours)	Male	103	7.35	5.866	1	25	0.197
	Female	145	8.34	5.968	1	30	
	Total	248	7.93	5.934	1	30	
Number of ED application in the last year	Male	103	4.43	3.945	0	21	**0.020**
	Female	145	3.52	2.138	0	10	
	Total	248	3.90	3.048	0	21	

Significant *p* valuesarepresented in bold.
AD: Alzheimer's disease, ED: Emergency Departments

Table 2: Average of Patients Over 65 Years of Admission to the Emergency Department in the Last One Year.

	Age Groups	Average application	Standard Deviation	Min.	Max	p
Emergency Service Applications (1 year)	65-74	2.90	1.854	0	7	0.050
	75-84	4.03	2.552	0	13	
	>84	4.16	4.325	0	21	

Table 3: Comorbidities of the Patients and Percentages of Existence.

Comorbidity	Number (n)	Percentage (%)
Hypertension	155	62,5
Diabetes Mellitus	66	26,6
Coronary Artery Disease	51	20,6
Cerebrovaskuler Disease	39	15,7
Chronic Renal Failure	27	10,9
Parkinson	13	5,2
Asthma/Chronic Obstructive Pulmonary Disease	13	5,2
Arrhythtmia	12	4,8
Malignancy	9	3,6
Congestive Heart Failure	9	3,6
Epilepsy	5	2,0
Bipolar Disorder	1	0,4
Hepatic Cirrhosis	1	0,4

When the people who took care of the patients were questioned, it was determined that 185 (74.6%) of them were cared for by their families, 34 patients (13.7%) stayed in s nursing home, 26 (10.5%) stayed at home with a nursemaid and 3 patients lived alone.

The comorbidities and percentages of the patients are given in Table-3. According to the table, the most common comorbidities in patients were hypertension (HT), diabetes, coronary artery disease, cerebro vascular disease and chronic kidney failure (CRF).

The complaints of the patients were examined (Table-4). As seen in Table-4; the most common complaints of patients were found as general condition disorder, dyspnea, fever, falling and asthenia.

The diagnoses received by the patients according to their admission complaints were evaluated as their primary diagnosis and it was showed in Table-5. According to the table, the most

Table 4: Examination of Patients According to the Application Complaints.

Complaint	Number	Percentage (%)
General Condition Disorder	47	18,9
Dsypnea	39	15,7
Fever	35	14,1
Fall	23	9,3
Asthenia	11	4,4
Abdominal pain	9	3,6
Seizure	9	3,6
Cough	8	3,2
Oral Intake Disorder	7	2,8
Speech Disorder	6	2,4
Others	54	22

Table 5: Primary Diagnoses of the Patients.

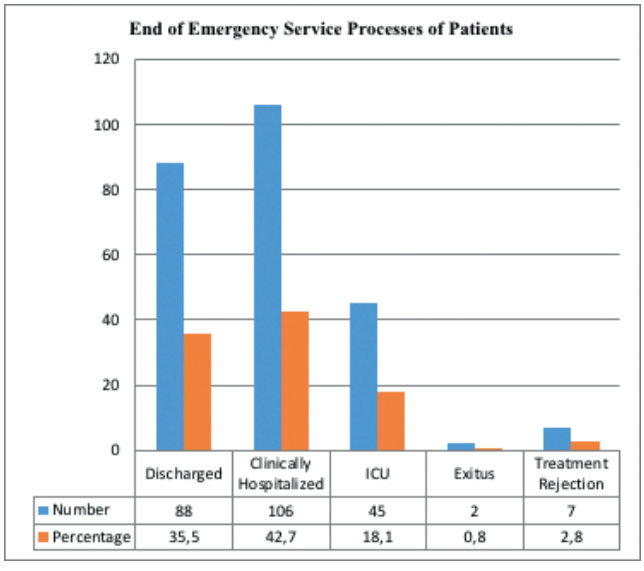
Primary Diagnoses	Number	Percentage (%)
Pneumonia	44	17,7
Ischemic Cerebro Vascular Disease	25	10,3
Urinary Tract Infection	23	9,3
Coronavirus disease 2019	16	6,5
Acute Renal Failure	15	6
Femur Fracture	9	3,6
Pulmonary Embolism	7	2,8
Soft Tissue Trauma	7	2,8
Hypernatremia	6	2,4
Upper Respiratory Infection	6	2,4
Others	90	36,2
Total	248	100

common diagnoses were pneumonia (17.7%), ischemic cerebro vascular disease (10.3%), urinary tract infection (UTI) (9.3%), COVID 19 (6.5%), acute renal failure (ARF) (6%).

Clinics for which consultation was requested were investigated. The rate of patients who requested one or more consultations was 81.5%. The most frequently consulted clinics were Chest Diseases (n=81), Internal Medicine(n=66), Neurology (n=56), Infectious Diseases (n=41), Cardiology (n=27), Anesthesia and Reanimation (n=20), Orthopedics (n=16) and Neurosurgery (n=12).

The termination of ED processes of the patients was examined. According to this, while 42.7% of the patients were hospitalized in clinics, 18.1% were admitted to the intensive care unit. While 35.5% were discharged from the hospital, two patients (0.8%) died while in the ED process. 2.8% left from the ED by signing treatment rejection (Figure 1).

When the patients' hospitalized clinics are compared, the first five places are seen as Chest Diseases, Internal



ICU: Intensive Care Unit

Figure 1: End of Emergency Service Processes of Patients.

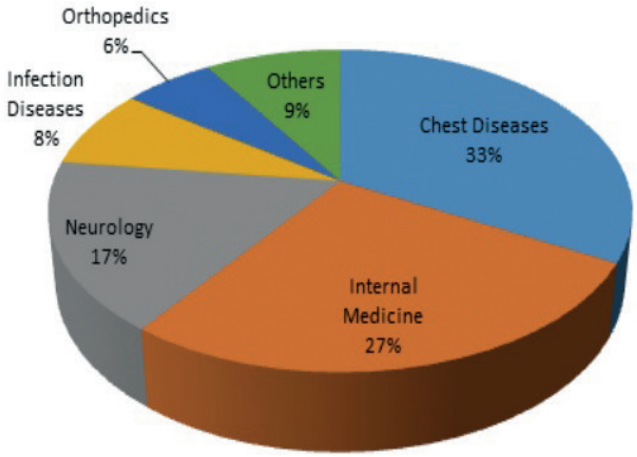


Figure 2: Distribution of Hospitalized Patients According to the Clinics

Medicine, Neurology, Infectious Diseases and Orthopedics clinics. The distribution of hospitalized patients according to clinics is schematized in Figure-2.

Discussion

The number of populations aged 65 and over is increasing globally, and there is an increase in the applications of elderly patients to the ED, which is the gateway to the hospital[9]. Diagnosis and treatment of elderly patients are difficult for ED physicians who do not receive adequate training for this condition[10]. Among the elderly patient groups, AD has a vital place[8]. We examined the causes, and care processes of AD cases admitted to the ED in our study.

In studies conducted on AD, It was seen that the mean age was approximately 81[8]. In our study, AD participants' mean age was 79.32 years, which was consistent with these studies.

Estrogen hormone decreases with menopause in women. It has been shown that the decrease of estrogen hormone, which is thought to reduce the risk of AD, is related to the increased incidence of AD in women[11]. According to several studies, the prevalence of AD is higher in women than in men[12]. In our study, the majority of the application (58.5%) were made by women.

Our country has limited nursing homes for Alzheimer's patients and institutional structures to support caregivers. Due to the culture of the society in which we live, the relatives of the patients consider caring for their patients a family duty[13]. It has been observed that 80-90% of care is provided by families in the United States[14]. On the contrary, patient care was mostly (75%) provided by their families in our study.

The number of chronic diseases increases with advancing age. In a study conducted with 72.815 patients over 64 years of age in Spain, the most common comorbidities in patients with dementia were hypertension and diabetes[15]. In a study performed on 497 patients with dementia in our country, the most common chronic disease was hypertension, followed by cataracts, depression, and diabetes[16]. In our study, the most common comorbid disease was found to be hypertension, while other comorbidities were diabetes, coronary artery disease, cerebro vascular disease and CRF, respectively.

Gülalp et al. examined applications of 2046 patients with ED over 65 years. The authors reported that the most common complaints at presentation were falling, chest pain, dyspnea, chronic extremity pain, abdominal pain, and fever[17]. In another study, the most common reasons for presentation in patients with AD were impaired consciousness, fever, falling, and dyspnea[18]. In our study, the most common complaints were general condition disorder, dyspnea, fever, falling from the same level, and fatigue.

A study conducted in Turkey found that the rate of consultation requested was 4.5% when all ED applications were examined[19]. In a study performed with geriatric patients, this rate was 43.4%[20]. In our study, which included only AD cases, the rate of patients for whom consultation was requested was 81.5%.

Logoğlu et al. examined the patients over the age of 65, and they determined that the departments for which consultation was requested most frequently were Cardiology, Internal Medicine, Chest Diseases, Neurology, and General Surgery[20]. Bozkurt et al. showed that the departments for which consultation was requested most frequently were Cardiology, Internal Medicine, Chest Diseases, Orthopedics, and Neurology[21]. In our study, the most frequently requested clinics for consultation were determined as Chest Diseases, Internal Medicine, Neurology, Infectious Diseases and Orthopedics.

Özşaker et al. reported that geriatric patients required more hospitalization and treatment compared to younger patients, and the duration of stay in the hospital was longer[22]. In a study conducted with patients over the age of 65 in 2018, the hospitalization rate was found to be 15.8%[23]. In a study by Wofford et al. on geriatric patients, the hospitalization rate from ED was between 32% and 46%[24]. In our study, the hospitalization rate of AD cases admitted to ED was 60.8%.

In the study conducted on the geriatric patient group by Bedel at al, it was determined that the departments with the highest number of hospitalizations were Internal Medicine, Cardiology, Chest Diseases and Neurology[23]. In our study, it was seen that the five clinics with the highest number of hospitalizations were Chest Diseases, Internal Medicine, Neurology, Infectious Diseases and Orthopedics clinics respectively.

Limitations

Although our study is multicenter and prospective, the small number of cases is one of the factors limiting our study.

Conclusion

As a result, the most common diagnoses in AD cases applying to ED were pneumonia, ischemic cerebro vascular disease and urinary system infection. Respectively, it has been determined that the frequency of applying to ED increases with age and that more than half of the patients have an indication for hospitalization. It is thought that increasing the geriatrician in hospitals will contribute positively to the diagnosis, treatment, and follow-up process of AD cases among the elderly patient groups. We hope that our study, which we think is one of the few studies in its field, can contribute to the literature. We believe that there is a need for new studies on the subject.

Conflict of Interest

No conflict of interest was declared by the authors.

Financial Disclosure

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