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Acute care of elderly inmates: A vulnerable patient population in emergency department from Turkey

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Abstract

Aim: Anatomic and physiological changes make the elderly more susceptible to diseases. Elderly prisoners are more likely to get ill in comparison with their non-prisoner peers because of inadequate access to health care and medicines, and they often have referrals to emergency departments. This study evaluates the elderly inmate emergency department admissions in Turkey. Material and Method: A retrospective cross-sectional descriptive study was conducted in the emergency department of a tertiary healthcare facility with approximately 210,000 admissions annually. Inmate patients ≥65 years of age were included. The 140 total patients were categorized as Group 1 (65-84 years) or Group 2 (>85 years). Emergency referrals were grouped as surgical, medical, psychiatric disorders, and injury. Results: Correlation between categorical variables was analysed with Pearson chi-square test, and the effect of each factor on variables dependent on multiple factors was tested using logistic regression analysis. A total of 140 elderly inmates were eligible for the study. There was the highest number of patients in the medical group (n=98, 70%), and the least in the injury and psychiatric groups (n=4, 2.8%). Cardiovascular system disorders were the leading referral cause. Males had a greater hospitalization rate (p=0.033) and females had no injuries. Recurrence was higher in Group 2 (p=0.007). 92 patients (67.6%) were discharged from emergency department. The mortality rate was 2% (n=17). Discussion: The number of elderly inmates and thus the corresponding rates of acute care in the inmate population are gradually increasing. Already-overburdened EDs are usually the first referral units for all health problems of this vulnerable population in Turkey. Therefore, prisons should provide critical healthcare on-site for their medically vulnerable elderly population.

Keywords

Elderly Inmate; Emergency Department; Acute Care

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Introduction

Prison inmates typically have poor general health because prisons usually have healthcare systems that are substantially worse than those available to general society. Primary factors accounting for the relatively poorer general health of inmates include poor sanitation and health conditions, inadequate medical supplies and care, and limited accessibility to healthcare services, resulting in a higher presentation of inmates to hospitals than their age- and sex-matched free society members [1, 2]. Despite the fact that inmates are afflicted with various diseases, their medical care is usually ignored worldwide and is often under-organized with inadequate healthcare facilities, causing public hospitals and emergency departments (ED) to be used to address illnesses of inmates [3].

In general, the elderly are more prone to most diseases because of various anatomic and physiological bodily alterations and comorbid conditions. Thus, elderly inmates are more susceptible than their free counterparts to being sick, primarily because of prison conditions, which are impaired by poor access to healthcare, medicine, and sanitation. Thus, the elderly inmate population is highly likely to fall ill more often than their free counterparts, requiring frequent admission to EDs.

Typically, EDs are characterized by a dynamic working environment with a near-constant flow of unexpected admissions. In Turkey, prisons present emergency cases to EDs almost every day [4]. Although the health condition of inmates has been comprehensively investigated in other parts of the world, especially in developed countries, to date no domestic study has investigated the admission of elderly inmates to hospitals, particularly EDs, in Turkey. Thus, the present study aimed to assess elderly inmate admissions to an ED of a tertiary care hospital in Turkey and to analyse their demographic and clinical properties as well as their effects on ED settings.

Material and Method

Study design and setting

This retrospective cross-sectional descriptive study was conducted at the ED of an urban teaching hospital from January 1, 2010, to January 1, 2017 and was approved by the Local Committee of Ethics.

The hospital where the study was conducted is a tertiary healthcare service witnessing approximately 210,000 ED admissions annually. Besides the ED, it offers Emergency Surgery and Emergency Internal Medicine services, which are accountable for consultation and hospitalization of ED patients with referrals of general surgery problems and internal and its subspecialty disorders, respectively. Concomitantly, the facility offers a 12-bed hospital service to prison inmates. Consequently, it is accepted as the reference hospital for prisoner patient admissions in Ankara and those from other penal institutions outside of the province; particularly, its ED is responsible for the first medical contact of inmate patients.

Patient population and data collection

In this study, inmate patients ≥65 years of age who presented to the ED were eligible for inclusion in the study. We excluded inmate patients <65 years of age, those with no emergency referral, those whose hospital records were unavailable and those who were not imprisoned during the specified time interval. The eligible patients were grouped on the basis of their age: Group 1 (65-84 years) and Group 2 (>85 years).

We acquired data from the computerized medical records database of the hospital and patients' files and recorded the collected data on our pre-established proforma where demographic characteristics (name, age, and sex), consultations with other departments, cause of ED admission, diagnosis of patients, duration of hospitalization, recurrent admissions, disposal, and mortality rates were mentioned.

Based on hospital records, we grouped emergency referrals as surgical conditions (gastrointestinal, genitourinary, otorhinolaryngology, ophthalmology, burn injury, and cardiovascular surgery), medical disorders (cardiovascular, respiratory, neurological, internal, dermatological, musculoskeletal, and infectious diseases), injury, and psychiatric disorders. Furthermore, we formed subgroups based on diagnosis.

Statistical analyses

In this study, descriptive statistics comprised frequency, standard deviation (SD), median. Categorical variables are presented as numbers and percentage. We analysed the correlation between categorical variables using the Pearson chi-square test. In addition, we assessed the significance of the difference between the measurement values of both groups; while the Student's *t*-test was used to control normality, the Mann–Whitney *U*-test was used when normality criteria were not met. Furthermore, we tested the significance of repeated measurements using the paired-sample *t-test, and the effect of each factor on variables dependent on multiple factors* was tested using logistic regression analysis. Notably, we calculated the odds ratio for risk analysis of the risk factors, and $P < 0.05$ was considered to be statistically significant for all comparisons. All statistical analyses in this study were performed using the SPSS 23.0 software package.

Results

Demographical patterns

We enrolled 140 elderly inmates (age: 65–88 years; mean age: 71.3 ± 5.82 years; males: 96.4% [*n* = 135]; females: 3.6% [*n* = 5]) in this study. Group 1 comprised 136 patients and Group 2 comprised 4 patients; all females were in Group 2.

Clinical characteristics

Based on the major reason for referral, the highest number of patients was in the medical category (n = 98; 70%) and the lowest were in the injury and psychiatric groups (n = 4; 2.8%). Notably, psychiatric disorders and injury were absent in Group 2. The most frequent referrals in subgroups were cardiovascular (*n* = 35; 25%) in medical, gastrointestinal (*n* = 16; 11.4%) in surgical, anxiety disorders (*n* = 3; 2.1%) in psychiatric, and blunt trauma (*n* = 33; 56.59%) in injury patients (Table 1). Regarding ED visit patterns on an individual basis, once again medical, especially cardiovascular disorders, was the leading cause (Table 2).

Table 1. Referral paterns

			Count (n)	Column N (%)
Surgical				
	gastrointestinal		16	11,4%
	genitourinary		9	6,4%
	otorhinolaringologic		6	4,3%
	ophtalmic		1	0,7%
	Burn injury		0	0,0%
	Cardiovascular surgery		2	1,4%
Medical	cardiovascular		35	25,0%
	respiratory		13	9,3%
	neurology		8	5,7%
	internal		23	16,4%
	muscosceletal		6	4,3%
	dermatologic		1	0,7%
	infectious		12	8,6%
Pschiyatric			4	2,9%
Injury			4	2,9%
	Injury type	Blunt	4	100,0%
		penetran	0	0,0%
		Mix	0	0,0%
	Trauma region	headandneck		40,0%
		mxf		0,0%
		tx		20,0%
		abdomen		0,0%
		extremity		20,0%
		multiple		20,0%

Overall, 23 (15.6%) patients presented with different types of malignancies, which originated from the respiratory system in 12 patients (mainly the lungs, *n* = 9), gastrointestinal system in 6 (mainly the stomach), reproductive system in 4 (mainly the prostate glands), and brain and hematological neoplasms in 2. In addition, 2 patients were diagnosed with communicable diseases, especially hepatitis B, and 1 patient had end-stage hepatic disease.

When analysing referrals regarding consultations from other departments, referrals for 85 (60.7%) patients were requested. Of all the requests, cardiology was leading with 25 (17.9%) requests. While 23 patients had multiple consultations from other departments (16.4%), 55 (39.3%) had no consultation requirement. Furthermore, there were no other requests from 11 departments.

Clinical characteristics and comparisons

Tables 3 and 4 present comparisons of recurrent admission, diagnostic groups, hospitalization, and clinical outcomes between male–female and age-specific groups. Males had a higher hospitalization rate than females ($P = 0.033$). We observed no sex-based difference between other variables ($P > 0.05$); however, injury-induced admission was absent in females.

Clinical outcomes

Overall, 44 (31.4%) patients were hospitalized. The min and max duration of hospitalization was 1 and 48 days, respectively (mean: 7 ± 8.78 SD days). In addition, 95 (67.8%) patients were discharged from the ED. Regarding the clinical outcomes of those who were hospitalized by other departments, 37 (26.4%) were discharged with full recovery, 7 (5.1%) were deceased, and 1 (0.7%) was referred to another institution. Furthermore, the mortality rate was 2% (*n* = 17), and 51 (36.4%) patients had recurrent referrals to the ED.

Table 2.

Surgical		Count (n)	Column (%)
	Gastrointestinal		
	Nonspesific abdominal pain	7	5,0%
	Biliary disorders	3	2,1%
	Pancreatic disorders	0	0,0%
	Ileus	2	1,4%
	Postop complications	2	1,4%
	Acute appandicitis	1	0,7%
	Hemorrhoidis	1	0,7%
	Genitourinary		
	Urolithiazis	1	0,7%
	Hematuria	4	2,9%
	Prostat gland disorders	4	2,8%
	Otorhinolaringologic		
	epistaxis	2	1,4%
	acute tonsillopharyngitis and rhinopharyngitis	2	1,4%
	Vertigo	2	1,4%
	Ophtalmic		
	Ophtalmia	1	0,7%
	Burn injury		
	Cardiovascular surgery		
	Periferic vascular disorders	3	2,1%
	Aortic diorders	1	0,7%
Medical			
	Cardiovascular		
	Acute coronary syndrome-Chest pain	30	21,4%
	Congestive heart failure	3	2,1%
	Arrhythmia	1	0,7%
	Hypertension	1	0,7%
	Syncope	0	0%
	Respiratory		
	Pneumothorax	0	0,0%
	Dyspne	6	4,3%
	Hemoptysis	1	0,7%
	COPD exacerbation	3	2,1%
	Internal disorders		
	General condition disorder	9	6,4%
	Diabetes and complications	2	1,4%
	ARF-CRF	4	2,9%
	Gastrointestinal haemorrhage	1	0,7%
	Haemotologic disorders	2	1,4%
	Oncologic diorders	1	0,7%
	Hepatic disorders	2	1,4%
	Nause-vomiting	2	1,4%
	Neurological disorders		
	Stroke	7	5,0%
	Headache	0	0,0%
	Demantia	1	0,7%
	Seziure	1	0,7%
	Infectious disorders		
	Urinary tract infections	1	0,7%
	Pneumonia	8	5,7%
	Acute gastroenteritis	2	1,4%
	Skin and soft tissue infections	1	0,7%

referral subgroups

Discussion

The ED deals with medical and surgical emergencies as well as injuries on a 24-hour basis. During their practice, emergency specialists encounter various patient types and behaviors, one of which is the inmate population. Among inmates, the elderly

Table 3. Clinical comparisons of characteristics in terms of gender

Variable	Category	Male		Female		p
		n	%	n	%	
Recurrence	Yes	49	36.3%	2	40%	0,866
	No	86	63.7%	3	60%	
Referral groups	Surgical	34	25.2%			0.078
	Medical	94	69.6%	4	80%	
	Physciatric	3	2.2%	1	20%	
	Injury	4	3%			
Hospitalization	Absent	95	70.4%	4	80%	0.017
	Exist	40	29.6%	1	20%	
Outcome	Exitus	7	5.2%			0,053
	Discharged with full recovery	33	24.4%	4	80%	
	Discharged from ED	94	69,6%	1	20%	
	Dispatched	1	0,7%			

Table 4. Comparison of clinical characteristics in terms of age-based groups

Varibale	Category	65-84		85 and over		
		n	%	n	%	P
Gender	Male	96	97.8	2	50	0.696
	Female	3	2.2	2	50	
Referral groups	Surgical	32	23.5	2	50	0.661
	Medical	79	70.6	2	50	
	Physciatric	4	2.9			
	Injury	4	2.9			
Hospitalization	Absent	93	68.4	3	75	0.779
	Exist	43	31.6	1	25	
Recurrence	Yes	47	34.6	4	100	0.007
	No	89	65.4			
Outcome	Exitus	7	5.1			
	Discharged with full recovery	36	26.5	1	25	0.966
	Discharged from ED	92	67.6	3	75	
	Dispatched	1	0.7			

present a unique and challenging population that experiences the adverse impact of aging as well as the increasing prevalence of comorbidities coupled with poor healthcare conditions in prisons [5, 6]. Medically incompetent prisons catering to an increasingly aging inmate population result in an upsurge in ED presentations of elderly inmates [7].

In the global inmate population, females constitute only a minority, with overall 4%–6% females and 12% among those aged >70 years [8–11]. This study demonstrates a similar gender distribution with a female percentage of 3.6%; however, the percentage of elderly inmates considerably deviated from previous studies in the literature. One study reported that female inmates are characterized by worse self-rated health than male inmates and typically require health care services more frequently than their male counterparts [10]. However, our study highlights that elderly male inmates present to EDs more frequently than their female counterparts, which, perhaps, is attributable to our small sample size.

Among the causes of ED admissions, medical emergencies, of which cardiovascular disorders predominate, are the leading etiologies. Reportedly, inmates exhibit a higher rate of chronic disorders, including hypertension, asthma, arthritis, certain cancer types, and hepatitis because of living conditions and substance abuse both before and during prison life, including smoking, illicit drugs, and alcohol [2, 12–15]. Prison life is more likely to accelerate aging, and inmates look and feel older than their age-matched free counterparts; for instance, inmates are physiologically 10–15 years older than their chronological age and inmates aged 50–55 years are considered to be elderly [4, 16]. The relatively higher prevalence of chronic illnesses among inmates than in free society is attributed to increased age, a high burden of risk factors for cardiovascular and cerebrovascular disorders, poor social relations, and anxiety and depression. In this study, we did not assess the comorbidities of patients, but as our study population was aged, acute coronary syndromes and chest pain were the leading causes of ED admissions.

Reportedly, elderly inmates exhibit a high incidence of depression and anxiety because of their sentences and the traumatic living conditions in prisons. This increases their tendency to develop chronic illnesses even beyond the generally-higher rate for the elderly [15, 17]. Although we determined a lower rate of psychiatric disorders in this study, anxiety was the main cause of the disorders determined.

Older inmates have special healthcare requirements that are often considered inappropriate for prisons' higher security standards, and which should be addressed with an evidence-based use of medical resources. Prison rules, which are often inflexible, may prohibit keeping healthcare kits inside cells; this may indicate incompetent prison management [15]. Considering the rates of admission and discharge from the ED (*n* = 96, (68.5%) and 95 (67.8%,) respectively), enabling this sensitive population to be managed within the prison without referral to the ED is an acceptable suggestion.

Predominantly, male inmates are more susceptible to injury because of both violence and accidents. The aging process adversely affects decision-making and social skills, causing attention problems, reduced cognitive and emotional functions, increased aggression, and the absence of impulse control [4, 17]. However, our study determined that injury was the least common mode of referral for elderly inmates, and was entirely absent in females and Group 2; this can be attributed to functional impairment among females and the elderly. Furthermore, as head and neck injuries were the most common ones (40% of injuries), trauma seemed more likely to be due to accidents.

Despite the varying data on the incidence of inmate surgical conditions in the literature [2, 4], the leading cause of the ED admissions was non-specific abdominal pain, which corroborates our findings, which could result from psychiatric and social factors [4]. Other probable causes include inadequate and unhealthy nutrition coupled with continuing and ensuring compliance with any available treatment for chronic disorders.

Caring for prison inmates and the free population together in an overloaded ED that is faced with approximately 180000 admissions annually leads to adverse outcomes for both populations. Inmates tend to behave violently in EDs as well as inside prison because of their exposure to the unfriendly, hostile prison environment. Consequently, physical and verbal threats, assaults, workplace chaos, and escape attempts by prisoners ensue during ED visits. Thus, vulnerable elderly inmates pose unique problems in EDs in terms of both logistics and security,

increasing the need for extra measures and personnel, as well as custodial guards to accompany them [4]. In this study, 70.4% of elderly inmates were discharged from the ED, suggesting that older inmates could be treated at advanced penal healthcare units with sufficient equipment and staff.

Conclusion

The increasing proportion of older inmates in prisons and the lack of studies elucidating acute care in this population renders the present study critical for quantifying increased rates of acute care in this population in Turkey. Our findings suggest that prisons should provide critical healthcare on-site for their medically vulnerable elderly population.

Scientific Responsibility Statement

The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

Animal and human rights statement

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.

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Conflict of interest

None of the authors received any type of financial support that could be considered potential conflict of interest regarding the manuscript or its submission.

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