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RESEARCH

EPIDEMIOLOGICAL CHARACTERISTICS OF GERIATRIC PATIENTS IN EMERGENCY DEPARTMENTS: RESULTS OF A MULTICENTER STUDY

ABSTRACT

Introduction: The increasing proportion of elderly individuals in the population due to increased life expectancy has necessitated greater provision of health care. Here we aimed to determine patient characteristics, reasons for referral, and outcomes of emergency department visits and hospitalization in patients aged ?65 years with referrals to emergency departments.

Materials and Method: This prospective, multicenter observational study was conducted over one week at the emergency departments of 13 Turkey hospitals. All patients aged ?65 years who were referred to emergency departments with acute medical or surgical issues during the study period were included. Patients aged <65 years or those referred for trauma were excluded.

Results: In total, 1299 patients with a mean age of 74.8±7.3 years were included. Of these, 51.9% (n=674) were aged 65–74 years, 67.5% (n=877) were discharged from the hospital, and 5.8% (n=75) died during admission. The most frequently diagnosed disorders in the emergency departments were cardiovascular, gastrointestinal, and pulmonary diseases. A significant difference in age was observed between the survival and non-survival groups (p=0.001), with no significant differences in gender distribution (p=0.259), length of stay in intensive care units (p=0.605), or length of stay in hospital (p=0.055).

Conclusion: With an increased proportion of elderly individuals in the general population, the number of elderly patients referred to emergency departments continues to increase. This study presents the demographic features and clinical course of elderly patients referred to study centers.

Key Words: Elderly; Geriatric Assessment; Demography; Emergency Treatment.

ARAŞTIRMA

ACİL SERVİSLERDEKİ GERİATRİK HASTALARIN EPİDEMİYOLOJİK ÖZELLİKLERİ: ÇOK MERKEZLİ ÇALIŞMA SONUÇLARI

ÖZ

Giriş: Beklenen yaşam süresinin uzamasının sonucu olarak yaşlı popülasyondaki artış, bu yaş grubu için daha sık sağlık bakımı verilmesini zorunlu kılmaktadır. Bu çalışmada acil servise başvuran 65 yaş ve üzeri hastaların genel özelliklerini, başvuru nedenlerini, acil servis ve hastane ziyaretlerinin sonuçlarının saptanması amaçlandı.

Gereç ve Yöntem: Çok merkezli, prospektif, gözlemsel çalışma Türkiye'de 13 hastanenin acil servislerinde bir hafta süre ile gerçekleşti. Çalışma süresi içinde akut tıbbi veya cerrahi sorunlar ile acil servise başvuran 65 yaş ve üstü hastalar çalışmaya dahil edildi. Altmış beş yaş altı ve/veya travma nedenli başvurular ise çalışma kapsamına alınmadı.

Bulgular: Ortalama yaşı 74.8±7.3 yıl olan toplam 1299 hasta çalışmaya dahil edildi. Bu hastalardan %51.9'u (n=674) 65-74 yaş grubundaydı, %67.5'u (n=877) hastaneden taburcu edildi ve %5.8'i (n=75) yatış süreci içinde öldü. Acil serviste en sık konulan tanılar kardiyovasküler, gastrointestinal ve solunum hastalıklarıydı. Hastaneden taburcu olan ve hastane yatışı sırasında ölen hasta grupları kıyaslandığında yaş açısından istatistiksel olarak anlamlı fark varken (p=0.001), cinsiyet dağılımı (p=0.259), hastane yatış süresi (p=0.259) ve yoğun bakım ünitesi yatış süresi (p=0.055) açısından fark tespit edilmedi.

Sonuç: Yaşlı nüfusunun ve genel nüfusa oranının artışı ile birlikte yaşlı hastaların acil servis başvuru sayısı artıyor ve gelecekte daha da artacaktır. Bu çalışma, çalışma merkezlerine başvuran yaşlı hastaların demografik özelliklerini ve klinik seyirlerinin sonuçlarını ortaya koymaktadır.

Anahtar Sözcükler: Yaşlı; Geriatrik Değerlendirme; Demografi; Acil Tedavi.

INTRODUCTION

According to 2014 population statistics, citizens aged ≥65 years comprise 8% of the total population in Turkey. This ageing population comprises over 6 million people, surpassing the total population of a number of countries, including Denmark, Slovakia, Finland, and Norway. Furthermore, this age group comprises 8.3% of the total global population. Among 228 countries, Monaco ranks first with the largest elderly population, followed by Japan and Germany, whereas Turkey ranks 94th. It has been predicted that the proportion of elderly individuals in Turkey will be 10.2% of the total population in 2023, 20.8% in 2050, and 27.7% in 2075 (1). The increased proportion of elderly individuals is predominantly due to increased life expectancy, resulting in a range of associated health issues that necessitate greater provision of health care.

When compared with young individuals, elderly patients are referred to emergency departments (EDs) more often and with more complicated presentations, require longer duration in intensive care units (ICUs) and EDs, and are more frequently hospitalized (2-6). Hence, health professionals working in EDs should be familiar with the characteristics of elderly patients and common reasons for referral in order to provide the necessary infrastructure and training. Thus, a greater level of expertise in the care for the elderly can be attained. The purpose of this multicenter study was to determine patient characteristics, reasons for referral, and outcomes of ED visits and hospitalizations in patients aged ≥65 years with ED referrals.

MATERIALS AND METHOD

Study Design

This prospective, multicenter observational study was conducted over one week at the EDs of 13 hospitals belonging to universities, state, and military. The study included patients aged ≥65 years with medical or surgical issues requiring admission to EDs. The purpose of the present study was to determine patient characteristics and the outcomes of ED visits in a geriatric population in Turkey.

Study Settings

This study was conducted in 13 hospitals in the provinces of Ankara, Aydin, Denizli, Diyarbakir, Erzurum, Gaziantep, Istanbul, Konya, Manisa, Ordu, Rize, and Samsun in 7 different geographical regions of Turkey between September 1 and 7, 2014. All hospitals were academic centers with emergency medicine specialist training programs. The coordination centers of the present study were Konya and Ankara. All patients aged ≥65 years who were referred to EDs with acute medical or surgical issues during the study period were included in the present study. Patients aged <65 years or those referred for trauma were excluded. Patients who had received pre-hospital cardiopulmonary resuscitation or were transferred to hospitals other than the study centers were also excluded from the present study.

Study Protocol

The following data for patients who met the study inclusion criteria were recorded: age, gender, major complaints, comorbidities, medications, diagnosis, admission and discharge information, admission wards, length of stay (LOS) in ICUs, LOS in hospital, and in-hospital mortality. Patients were followed-up until discharge from the hospital or death.

Statistical Analyses

Statistical Package for the Social Science Version 16.0 (SPSS Inc., Chicago, IL, USA) was used for the statistical analysis of all obtained data. Categorical data were expressed as numbers and percentage and continuous data as mean ± standard deviation (SD). Univariate analyses were performed using the Chi-square test for categorical variables and Student's *t*-test for continuous variables. P-values of <0.05 were considered statistically significant.

RESULTS

A total of 1299 patients aged ≥65 years referred to EDs with non-traumatic, acute surgical, or medical problems were included in the present study. The mean age of the included patients was 74.8±7.3 years. Of these, 674 (51.9%) were aged 65–74 years and 145 (11.2%) were aged ≥85 years, with 680 (52.3%) females (Table 1). No significant differences in gender distribution were observed between the age groups (p=0.422) (Table 2).

The most frequent complaints were related to gastrointestinal (25.8%, n=333), pulmonary (18.2%, n=237), and central nervous (16.8%, n=218) systems (Table 1). No significant difference in the distribution of complaints was observed between the age groups (p=0.081).

According to medical histories provided by patients and/or their relatives, 10.2% (n=133) of patients had no previous history of a known disease. The most frequent comorbi-



Table 1— Distribution of Demographic Features, Leading Complaints, Comorbidities and Number of Daily Medications, Results of ED and Hospital Visiting of the Study Group

A. Demographic parameters	
Age[α]	74.8±7.3
Age groups[β]	
65-74	674 (51.9%)
75-84	480 (37.0%)
≥85	145 (11.2%)
Total	**1299 (100%)**
Gender[β]	
Female	680 (52.3%)
Male	619 (47.7%)
Total	**1299(100.0%)**
B. Leading Complaints[βλ]	
Gastrointestinal	330 (25.4%)
Pulmonary	237 (18.2%)
Central nervous system	218 (16.8%)
Multisystem	194 (14.9%)
Cardiovascular	125 (9.6%)
Skeletomuscular	96 (7.4%)
Genitourinary	60 (4.6%)
Others	39 (3.0%)
Total	**1299(100.0%)**
C. Comorbidities[βΩ]	
Hypertension	673 (51.8%)
Diabetes mellitus	321 (24.7%)
Coronary heart disease	279 (21.5%)
COPD / asthma	232 (17.9%)
Malignity	198 (15.2%)
Congestive heart failure	150 (11.5%)
Any known disease	133 (10.2%)
Cerebrovascular accident	84 (6.5%)
Chronic renal failure	79 (6.1%)
Hyperlipidemia	78 (6.0%)
Arrhythmia	70 (5.4%)
Dementia / Alzheimer disease	64 (4.9%)

D. Number of Medications[β]	
2	282 (21.7%)
4-6	254 (19.6%)
Any known medication	251 (19.3%)
1	251 (19.3%)
3	227 (17.5%)
>6	34 (2.6%)
Total	**1299 (100%)**
E. ED and hospital visiting results	
ED visiting[β]	
Discharged from ED	877 (67.5%)
Admission to a ward	282 (21.7%)
Admission to the ICU	140 (10.8%)
Total	**1299 (100.0%)**
Length of stay in hospital[π]	8.3 ± 6.7
Length of stay in ICU[π]	6.3 ± 6.9
Exitus during hospital stay[β]	75 (5.8%)
F. Last Diagnosis[βλ]	
Cardiovascular	253 (19.5%)
Gastrointestinal	228 (17.6%)
Pulmonary	197 (15.2%)
Genitourinary	98 (7.5%)
Neurology	95 (7.3%)
Others	74 (5.7%)
Infection	73 (5.6%)
Nose-throat-ear	68 (5.2%)
Skeletomuscular	65 (5.0%)
Oncology	54 (4.2%)
Nephrology	45 (3.5%)
Endocrine	22 (1.7%)
Psychiatric	17 (1.3%)
Intoxication	10 (0.8%)
Total	**1299 (100.0%)**

ED: Emergency Department; ICU: Intensive Care Unit; [α]Described as mean value ± SD and year; [β]Described as number (n) and percentage (%); [π]Described as mean value ± SD and day; [λ]Classified according to the organ system; [Ω]One patient can have more than one disease

dities in the remaining patients were hypertension (51.8%, n=673), diabetes mellitus (24.7%, n=321), and coronary heart disease (21.5%, n=279). Of these patients, 19.3% (n=251) had no history of regular medication usage and 61.4% (n=797) had a history of multiple medication usage (two or more medications per day) (Table 1).

ED referrals ended in discharge for 67.5% (n=877) of patients and hospitalization in a ward or ICU in 32.1% (n=422) of patients (Table 1). A significant difference in the rate of discharge or admission was observed between the age groups (p=0.034). The rate of ED discharge was higher in the 65–74 age group (71.2%) and the rates of admission to a ward or ICU were higher in the 75–84 age group (25.2% and 12.5%, respectively) (Table 2).

The most frequently diagnosed disorders in patients referred to EDs were cardiovascular (19.5%, n=253), gastrointes-

Table 2— Distribution of Parameters by Age Groups

Parameters	Age Group	65 - 74 (n=674)	75 - 84 (n=480)	≥85 (n=145)	p value
Gender[β]					0.422
	Male	322 (47.8%)	235 (49%)	62 (42.8%)	
	Female	352 (52.2%)	245 (51%)	83 (57.2)	
Result of ED visiting[β]					0.034
	Patients discharged from ED	480 (71.2%)	299 (62.3%)	98 (67.6%)	
	Patients admitted to a ward	131 (19.4%)	121 (25.2%)	30 (20.7%)	
Patients admitted to the ICU		63 (9.3%)	60 (12.5%)	17 (11.7%)	
Length of stay in ICU[π]		6.73±7.56	6.60±6.90	5.21±6.35	0.683
Length of stay in hospital[π]		10.33±8.80	8.06±7.82	7.53±6.29	0.340
Result of hospital visiting[β]					0.009
	Patients discharged from hospital	646 (95.8%)	448 (93.3%)	130 (89.7%)	
	In hospital mortality	28 (4.2%)	32 (6.7%)	15 (10.3%)	

ED: Emergency Department; ICU: Intensive Care Unit; [β]Described as number (n) and percentage (%); [π]Described as mean value ± SD and day.

tinal (17.6%, n=228), and pulmonary (15.2%, n=197) diseases (Table 1). No significant differences in the distribution of final diagnoses was observed between the age groups (p=0.067).

Patients were most frequently hospitalized in internal medicine (28.5%, n=119), cardiology (19.4%, n=81), and respiratory disease (13.4%, n=56) wards. The mean LOS in hospital was 8.3 ± 6.7 days, whereas the mean LOS in ICUs was 6.3±6.9 days. Of the admitted patients, 75 (5.8%) died during hospitalization (Table 1). No statistically significant difference in the LOS in ICUs or hospital were observed between the age groups (p=0.683, and p=0.340, respectively). However, a significant difference in the prognosis of hospitalized patients was observed between the age groups (p=0.009). The 65–74 age group had a higher rate of discharge (95.8%) compared with the ≥85 age group, which had a high mortality rate (10.3%) (Table 2).

Patients referred to EDs were categorized into "survival" and "non-survival" groups (Table 3). A significant difference in age (p=0.001) was observed between the survival and non-survival groups, with no significant difference in gender distribution (p=0.259), LOS in ICUs (p=0.605), and LOS in

Table 3— Distribution of Parameters by Survival and Non-survival Groups

Parameters	Groups	Survival (n=1224)	Non-survival (n=75)	p value
Age[α]		74.64±7.26	77.45±7.47	0.001
Gender[β]				0.259
	Male	588 (48%)	31 (41.3%)	
	Female	636 (52%)	44 (58.7%)	
Length of stay in ICU[π]		6.07±6.9	6.73±6.85	0.605
Length of stay in hospital[π]		8.55±6.68	6.75±6.59	0.055
Results of hospital admissions (n=422)[β]				<0.001
	Patients admitted to a ward	256 (73.8%)	26 (34.7%)	
	Patients admitted to the ICU	91 (26.2%)	49 (65.3%)	

ED: Emergency Department; ICU: Intensive Care Unit; [α]Described as mean value ± SD and year; [β]Described as number (n) and percentage (%); [π]Described as mean value ± SD and day.



hospital (p=0.055). When the 422 patients who were hospitalized following referral to ED were evaluated, a significant difference in mortality was observed between patients hospitalized in wards and patients admitted to ICUs (p<0.001). A higher mortality rate was observed in patients admitted to ICUs (65.3%) (Table 3). A significant difference in mortality was also observed according to the major complaint requiring ED referral (p=0.013). The non-survival group had higher rates of multisystemic (29.3%, n=22), pulmonary (21.3%, n=16), and gastrointestinal (20%, n=15) complaints. Furthermore, a significant difference in mortality was observed according to the final diagnosis made in the ED (P<0.001). In the non-survival group, higher rates of diagnosed pulmonary (21.3%, n=16), nephrologic (21.3%, n=16), and infectious (17.3%, n=13) diseases were observed.

Discussion

In Turkey, 3.6%–41% of patients referred to EDs are elderly (2-4, 7-9). In developed countries, 20% of referrals to EDs are patients aged ≥65 years (10-12). These rates are a reflection of the ageing populations of developed countries.

Previous single-center studies in Turkey have reported the mean age of elderly referrals to EDs as 74.50±6.53 (4), 73.18±6.94 (7), and 74.5±8.5 (13) years. The mean age of patients in the present study is consistent with these previous findings in Turkey (4,7,13). The mean age of elderly patients referred to EDs has been reported as 76.8±8.0 years by an Irish study (10) and 82 years (min, 60; max, 103) by a Chinese study (14).

In the present study, we observed a greater number of ED referrals in the 65–74 age group compared with other age groups. A previous study reported more referrals in the 65–74 age group, whereas another study reported the highest number of ED referrals in the 75–84 age group (3,4). The findings of the present study are consistent with those of a previous study reporting that 60.3% of the aged population in Turkey is in the 65–74 age group (1).

The female/male ratio among elderly groups referred to EDs is reportedly variable, with a female predominance. In Turkey, the proportion of female patients among elderly patients with ED referrals reportedly ranges from 44.2%–59.2% (3,4,7,13). In the present study, more females than males were observed in all elderly patient groups. Consistent with the results of Kapçi *et al.* (3), no difference in gender distribution was observed between the age groups. These findings may be due to the greater number of females than males in the geriatric population in Turkey (1). A Chinese study (14) reported that more males are referred to EDs, whereas an Irish study (10) reported that more females are referred.

In Turkey, the prevalence of chronic diseases among elderly patients ranges from 72.6%–94.4% (15,16). It has been reported that among elderly patients referred to EDs, 72.8% have at least 1 and 32.5% have ≥2 chronic disease(s) (13). Consistent with the results of the present study, Loğoğlu *et al.* (4) reported that the most frequently observed disorders in elderly patients referred to EDs are hypertension, coronary artery disease, and diabetes mellitus.

The increased incidence of a number of disorders with advanced age and the tendency to prescribe multiple medications to patients staying in residential services have changed the pattern of medication use in elderly patients (17). Özşaker *et al.* (13) reported that 56.2% of elderly patients referred to EDs were receiving continuous pharmacological treatment. We observed a high prevalence of chronic disease and frequent continuous pharmacological treatment in elderly patients referred to EDs. In light of these findings, health professionals in EDs should be aware of the different pharmacokinetic and pharmacodynamic features of particular medications and consequent variations in pharmacological response among elderly patients (18). Furthermore, doctors working in EDs should determine the medications currently being used by elderly patients and consider these during diagnosis and treatment planning.

The most frequent complaints among elderly patients referred to EDs in Turkey are related to the respiratory, gastrointestinal, cardiovascular, and central nervous systems (3,4, 7,8,13), findings corroborated by the present study.

It has been reported that the most frequent diagnoses following referral to EDs are pneumonia, cerebrovascular disease, and chronic obstructive pulmonary disease (2). On the other hand, Kapçi *et al.* (3) reported that gastrointestinal, respiratory, and neurological diseases are the predominant disorders in such patients. In the present study, diagnoses were most frequently related to cardiovascular, gastrointestinal, and respiratory systems (Table 1). The most frequently reported disorders among elderly patients with ED referrals are respiratory, cardiological, and neurological diseases in China (14); infectious diseases, predominantly malaria, and hypertension-related cardiovascular diseases in Nigeria (19); and infectious, cardiovascular, and gastrointestinal diseases in Ireland (10).

The hospitalization rate of elderly patients referred to EDs in Turkey ranges from 11.5%–47.2%. Of the elderly patients hospitalized, 65.4%–81.4% are hospitalized in wards and 18.6%–34.6% in ICUs. These patients are most frequently hospitalized in cardiology, internal medicine, respiratory disease, neurology, and general surgery wards (3,4,7,13). An Irish study (10) reported the rate of hospitalization among elderly patients referred to ED as 63.5%. In the present study, we observed a higher rate of hospitalization, with patients most frequently hospitalized in internal medicine, cardiology, and respiratory disease wards. The results of the present study indicate elderly patients in Turkey are predominantly referred to EDs due to medical complaints rather than surgical complaints, with the exception of trauma.

LOS in hospital among elderly patients varies among previous studies. Regarding the mean LOS in hospital, Baz *et al.* (7) have reported 7.1±6.2 days whereas Loğoğlu *et al.* (4) have reported 4±6.6 days. In the present study, we observed a mean LOS in hospital of 8.3±6.7 days. Kennely *et al.* (10) reported a mean LOS in hospital of 13.1±19.0 days and found that the only important multivariate predictor of prolonged hospitalization was advanced age. We observed no differences in LOS in hospital or ICUs between the age groups in the present study (Table 1).

Among patients included in the present study, 5.8% (n=75) died during hospital admission. Single-center studies of elderly patients in Turkey have reported that following referral to EDs, the mortality rate in the ED ranges between 0.1% and 7.6% and in hospital ranges between 0.8% and 11.5% (7,8). A previous Irish study (10) reported a mortality rate in the ED of 14.6% in elderly patients. In contrast with the results of the present study, Üstündağ *et al.* (8) found no difference in age distribution between patients who survived compared with those who did not. The same authors (8), in a finding consistent with our results, found no difference in LOS in hospital. Further, this study reported that altered level of consciousness, respiratory distress, and abdominal pain are more frequent among patients referred to EDs who do not survive (8). In contrast with our results, according to data from the Turkish Statistics Institute (1), the most frequent causes of mortality in elderly patients are cardiovascular system disorders (46.8%), benign and malignant tumors (17.7%), and respiratory system disorders (11.7%). Many scoring systems for the prediction of hospitalization and prognosis have been proposed. Clinical studies have reported that the Modified Early Warning Score (MEWS) and VitalPAC Early Warning Score (VIEWS) have efficacy in the prediction of hospitalization and mortality during hospital stays and that the Rapid Emergency Medicine Score (REMS), REMS without the inclusion of age, and HOTEL scoring systems (Hypotension, Oxygen saturation, low Temperature, ECG changes, Loss of independence) have efficacy in the prediction of ICU stay duration and mortality during hospital stays (20,21). It has been posited that high scores on the Charlson Comorbidity Index indicate a high risk of mortality during hospital admissions (10). Mortality rates are dependent on patient factors as well as the quality of health care. Factors associated with mortality should be assessed and those that can be modified should be corrected. It has been reported that the use of the "Comprehensive Geriatric Assessment (CGA)" increases survival by up to 12 months in elderly patients referred to hospitals. The Comprehensive Geriatric Assessment can also be used in EDs (22,23).

We believe that the discrepancy between the results of the present study and those of previous studies are related to the frequency and reasons for the referral of elderly patients to EDs. Furthermore, subsequent clinical courses and prognoses have been shown to be related to the degree of development and demographic, socio-cultural, and climate differences among countries as well as health care infrastructure, diagnostic capability in treatment centers, and different approaches to the treatment of patients.

Concomitant with an increased proportion of elderly individuals in the general population, the number of elderly patients referred to EDs continues to increase. This multicenter study presents the demographic features and clinical course of elderly patients referred to EDs. The findings of the present study may guide the planning of future studies on the measurement and improvement of health care provided to elderly patients by EDs in Turkey.

Conflict of Interest

All authors have no conflict of interest to declare.

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RESEARCH

CAN BARTHEL INDEX PREDICT MORTALITY IN GERIATRIC PATIENTS ADMITTED TO THE EMERGENCY DEPARTMENT WITH A HIGH FEVER?

ABSTRACT

Introduction: Physical functional capacity decreases in geriatric patients owing to age and disease. In current practice, objective parameters to evaluate physical functional capacity in geriatric patients are rarely used in departments providing acute care, such as emergency departments. In our study, we aimed to determine whether the degree of change in basal admission Barthel Index scores has a prognostic significance for patients presenting with high fever.

Materials and Method: Patients over 64 years of age without a history of or requirement for an emergency response and a tympanic membrane temperature ≥37.2°C were included. Patients were divided into 3 groups according to their change of Barthel Index scores: >30 (major), 5–30 (minor) and no change.

Results: The study population comprised 218 patients. Statistically significant differences were found among basal Barthel Index scores and those obtained at admission and 1 month later in surviving patients and between basal and admission Barthel Index scores in patients who died (p<0.001). Statistically significant difference was found in the proportion of survivors and non-survivors in patients whose change in Barthel Index score was >30 (major change) (p=0.011). No difference was found in the proportions of survivors and non-survivors in patients with minor changes and no change.

Conclusions: Fever increases physical dependency in geriatric patients. Situations that result in a serious increase in functional dependency during admission may be related to short-term mortality in geriatric patients.

Key Words: Barthel Index; Fever; Geriatric Patient; Functional Capacity; Emergency Department.

ARAŞTIRMA

BARTHEL İNDEKSİ YÜKSEK ATEŞ YAKINMASI İLE ACİL SERVİSE BAŞVURAN GERİATRİ HASTALARINDA MORTALİTEYİ ÖNGÖREBİLİR Mİ?

ÖZ

Giriş: Yaş ve hastalıklar sonucu geriatrik hastalarda fiziksel fonksiyonel kapasite azalmaktadır. Geriatrik hasta grubunda fiziksel fonksiyonel kapasiteyi objektif olarak ortaya koyabilecek ölçekler güncel pratikte acil servis gibi akut bakım sağlayan birimlerde nadir kullanılmaktadır. Bu çalışmada ateş yüksekliği ile başvuran geriatrik hastalarda bazal-başvuru Barthel İndeksi skorlarındaki değişim derecesinin ateş yüksekliği ile başvuran geriatrik hastalarda prognostik bir öneme sahip olma olasılığının test edilmesi amaçlanmıştır.

Gereç ve Yöntem: Acil müdahale gereksinimi ve travma öyküsü olmayan 64 yaş üzeri timpanik membran ateş ≥37.2°C olan hastalar çalışmaya dahil edilmiştir. Hastalar Barthel İndeks değişimi >30 (majör), 5-30 (minör) ve değişikliğin olmadığı grup olmak üzere 3 gruba ayrılmıştır.

Bulgular: Çalışma popülasyonu 218 hastadan oluşmuştur. Hastaların bazal ve başvuru Barthel İndeksi skorları karşılaştırıldığında, sağ kalan hastaların bazal, başvuru ve 1 ay sonraki Barthel İndeks'leri arasında ve mortalite gelişen hastaların bazal ve başvuru Barthel İndeks'leri arasında anlamlı farklılık saptanmıştır (p<0.001). Bazal ve başvuru Barthel İndeks değişiminin >30 (majör) olduğu durum ile mortalite arasında istatistiksel anlamlı farklılık saptanmıştır (p=0.011). Minör değişimlerde ve değişikliğin olmadığı grupta farklılık saptanmamıştır.

Sonuç: Ateş geriatrik hastaların fiziksel bağımlılıklarını artırır. Bazal duruma göre başvuru sırasında ciddi fonksiyonel bağımlılık artışına yol açan durumlar geriatrik hastalarda kısa dönem mortalite ile ilişkili olabilir.

Anahtar Sözcükler: Barthel İndeksi; Ateş; Geriatrik Hasta; Fonksiyonel Kapasite; Acil Servis.

Introduction

The expected life span of the world's population and hence the proportion of the population at 65 years of age and older has increased. Compared with the total population, the emergency department (ED) admission rate of patients aged 65 years or older is higher (1). High fever accounts for 10% of ED admissions of geriatric patients, with 70–90% of these patients requiring hospitalisation with a 10 times greater mortality risk than non-geriatric patients (2). Infectious disease frequency is greater in geriatric patients than in non-geriatric patients owing to a weakening immunity, a higher frequency of comorbid diseases, functional disability (such as weakening in swallowing and reduction in cough reflex), residence in crowded places (such as a nursing home or eventide homes) and accompanying prosthetic instruments (3). Early diagnosis of infection, quick support and antibiotic treatment are crucial in geriatric patients to prevent potentially poor outcomes (4). Nevertheless, as a result of physiological changes, findings and symptoms in geriatric patients are not always that evident, which complicates the diagnosis (5).

As a result of age and disease, functional capacity in geriatric patients decreases. Knowing the basal functional state of geriatric patients before they visit the ED is important. Objective parameters and tests that determine functional capacity in geriatric patients objectively are well known and used particularly by nursing homes and current geriatric clinics; however, in the acute care setting, such as EDs, they are rarely used despite the increasing number of admissions (6, 7). Therefore, in our study, we used the Barthel Index (BI) to evaluate the physical condition of patients admitted to the ED with a condition, such as high fever, that affects general functional capacity. Furthermore, we aimed to determine whether the difference between basal and admission BI scores had a prognostic importance in geriatric patients admitted with a high fever and to measure functional status.

Materials and Method

Study Design and Setting

This prospective, observational, single-centre, cross-sectional study was conducted at the ED of the Ege University Hospital in İzmir, Turkey. Data were collected from consecutive geriatric patients (age > 64 years) who were admitted to the ED with fever between 22 September 2012 and 31 March 2013. The hospital has 2000 beds, and the annual number of ED patient visits are approximately 120,000 per year. Upon approval from the local ethics committees (Reference number 12-8/26), this study was conducted according to the Principles of the Declaration of Helsinki; written informed consent was obtained from every patient or patient representative who participated in the study.

Definition of Barthel Index

Barthel Index (Table 1) comprises 10 items that are related to activities of daily living and morbidity. Feeding, transfers between wheelchair and bed, grooming, bathing, walking,

Table 1— Barthel Index

Bowels	0 = incontinent (or needs to be given enemas) 5 = occasional accident 10 = continent
Bladder	0 = incontinent, or catheterised and unable to manage 5 = occasional accident 10 = continent
Grooming	0 = needs help with personal care 5 = independent face/hair/teeth/shaving (implements provided)
Toilet Use	0 = dependent 5 = needs some help, but can do something alone 10 = independent (on and off, dressing, wiping)
Feeding	0 = unable 5 = needs help cutting, spreading butter, etc., or requires modified diet 10 = independent
Mobility (On Level Surfaces)	0 = immobile or <45 metres 5 = wheelchair independent, including corners, >45 metres 10 = walks with help of one person (verbal or physical) >45 metres 15 = independent (but may use any aid; for example, stick) >45 metres
Transfers (Bed To Chair And Back)	0 = unable, no sitting balance 5 = major help (one or two people, physical), can sit 10 = minor help (verbal or physical) 15 = independent
Stairs	0 = unable 5 = needs help (verbal, physical, carrying aid) 10 = independent
Bathing	0 = dependent 5 = independent
Dressing	0 = dependent 5 = needs help but can do about half unaided 10 = independent (including buttons, zips, laces, etc.)

climbing up and going down stairs and urinary and faecal incontinence are evaluated. Scoring is based on whether or not the person gets help while performing these activities. According to total scores possible, the groups are as follows: 0–20, totally dependent; 21–61, severely dependent; 62–90, moderately dependent, 91–99, slightly dependent; 100, fully independent (8).

Definition of Fever in Geriatric Patients

In the guidelines issued by the Infectious Diseases Society of America regarding evaluation of fever and infection in patients requiring care, a single oral measurement of >37.8°C, repeated oral measurements of ≥37.2°C, a rectal temperature of ≥37.5°C, or a rise in body basal temperature of >1.1°C are all considered as fever in geriatric patients (9). Recently, the use of tympanic membrane temperature measurement is increasing owing to its convenience. Most health centres choose infrared tympanic membrane thermometers. Despite the scanty clinical information about the reliability of tympanic membrane thermometers in geriatric patients, most studies show that tympanic membrane thermometers yield readings similar to oral thermometers when compared with rectal thermometers (10). Therefore, because of its hygiene and ease of use, we decided to use tympanic membrane thermometers in our study and determined the fever threshold to be ≥37.2°C in repeated measurements.

Selection of Participants and Data Collection

Patients older than 64 years of age with no history of or requirement for an emergency response and a tympanic membrane temperature ≥37.2°C were included in this study. Patients' age, sex, vital parameters, final diagnosis, laboratory findings (leukocytes and C-reactive protein), ED treatments (antibiotics, vasopressor agents, blood products) and hospitalisation time periods were recorded. According to information provided by either patients or their relatives, the BI values of the time period before admission to the ED were calculated and recorded as basal BI values. The Barthel Index values of the patients at the time of admission were also recorded. Surviving patients discharged from the hospital were followed up 1 month later, and based on the information given either by patients or their relatives, Barthel Index values were calculated and recorded as 1-month BI values. The Barthel Index information was acquired from the patients who were responsive or, if not, from the relatives responsible for taking care of them. Through telephone conversations, at the same time, the mortality of the patients was also clarified. In the course of relating the difference between basal and admission BI (¢BI) values with mortality, being inspired by the study of Rozzini and colleagues, patients were divided into the following according to ¢BI: >30 (major), 5–30 (minor) and no difference (11). Nevertheless, patients who had a basal BI <30 were not included in the ¢BI analysis during the calculation of BI differences, because the calculation of functional capacity change (¢BI) in patients accepted as bedridden might give misleading results since the major ¢BI threshold was determined to be >30 points.

Statistical Analysis

Demographic data are presented as percentages, averages and standard deviations. The normal distribution of data was determined using the Kolmogorov-Smirnov test. The Mann–Whitney U test was used for comparisons of independent data that did not demonstrate a normal distribution, including ordinal data. Changes in basal, admission and 1-month BI values were evaluated using the Friedman test in patients who survived for 1 month and those who died. Comparisons between two groups were performed using the Wilcoxon test and evaluated using the Bonferroni correction. A total type-1 error level of 5% was used for statistical significance. SPSS version 16.0 was used for statistical analysis.

RESULTS

Baseline Characteristics

In total, 226 patients were included; eight patients were excluded because they were not available for the phone survey, leaving a study population of 218 patients. Of the surviving patients (n=181), 72.9% (n=132) were 65–79 years of age and 27.1% (n=49) were ≥80 years of age. Of the patients who died (n=37), 64.8% (n=24) were 65–79 years of age and 35.2% (n=13) were ≥80 years of age. Patients who survived were most frequently diagnosed with pneumonia (23.2%), urinary tract infection (21.5) and non-focal fever (17.7%). In patients who died, the most common diagnoses were pneumonia (32.5%), a non-infectious condition (18.9%) and non-focal fever (16.2%). The main characteristics of the study groups are given in Table 2.

Main Findings

We found significant differences between basal, admission and 1-month BI scores of surviving patients and between basal and admission BI scores of non-survivors (Table 3). The



Table 2— Baseline Characteristics of the Study Groups

Demographic Findings	Survivors (n=181)	Non-survivors (n=37)	p
Sex (male), n (%)	90 (49.7%)	20 (54.1%)	0.632
Age, years	74.8 (65–96)	75.1 (65–90)	0.880
Vital Findings, mean±sd			
Temperature (C°)	38.3±0.6	38.1±0.5	0.080
Systolic blood pressure (mmHg)	135±25	127±27	0.073
Diastolic blood pressure (mmHg)	72±15	74±16	0.292
Pulse (bpm)	104±19	105±25	0.886
Saturation O_2%	94±5	91±7	0.015
Laboratory Findings (Associated with Infection), mean±sd			
White blood cell count, /µL	11466±6542	13573±9775	0.394
C-reactive protein level	10±9	14.1±10	0.017
Emergency Department Treatment Efforts, n (%)			
Blood product use	13 (7.2)	3 (8.1)	0.739
Antibiotics therapy	46 (25.4)	7 (18.9)	0.529
Vasopressor agent use	4 (2.2)	11 (29.7)	<0.001
Secondary Outcomes, mean±sd			
Hospital Length of Stay (hours)	98±144	546±2368	0.014

Table 3— Barthel Index Scores in Survivors and Non-survivors

	Mean±sd	p
Survivors		
BI Basal Score	87.5(±24.7)	**<0.001**
BI Admission Score	73.2(±30.7)	
BI 1-month Score	85.1(±26.8)	
Non-survivors		
BI Basal Score	60.8(±37.5)	**<0.001**
BI Admission	31.7(±28.0)	

Table 4— Overall Change in Barthel Index Scores

	Survivors (n=181)	Non-survivors (n=37)	p
Admission–basal BI score	14.3(±17.0)	29.1(±23.2)	<0.001

fact that the BI scores of surviving patients who were discharged reached the same average value at 1 month as their basal BI scores drew attention. Although we observed a statistically significant difference among basal, admission and 1-month values ($p<0.001$); no difference was found between basal and 1-month values in survivors ($p=0.035$) (Table 3).

Furthermore, the difference between basal and admission BI values was greater in non-survivors (Table 4).

We found a statistically significant difference in the proportion of survivors and non-survivors in patients whose change in BI score was >30 (major change) ($p=0.011$). No difference was found in the proportions of survivors and non-survivors in patients with minor changes and no change (Table 5).

Discussion

The Barthel Index is a frequently used scale that was developed to analyse the activities of daily living of geriatric patients. Identification of a patient's basal level by measuring activities of daily life enables determination of possible declines, which may be predictive for depression, dementia, falling, incontinence, vision problems and other diseases (12).

During ED admissions, it is difficult for a clinician to determine the level of functional dependence of a geriatric patient with a high fever. Therefore, we used the BI, which is an objective means for evaluating a patient's functional physical state, in a geriatric subpopulation admitted to an ED with high fever and possible infection. We determined that high fever increases the vulnerability of geriatric patients, and therefore, the patients experience an increased dependency du-

Table 5—Difference Between Basal and Admission Barthel Index Scores in Survivors and Non-survivors

Change in Barthel Index Score*	Survivors (n=172), n (%)	Non-survivors (n=26), n (%)	p
>30 (Major change)	35 (20.3%)	15 (57.7%)	0.011
5–30 (Minor change)	56 (32.5%)	10 (38.5%)	0.086
No Change	81 (47.2%)	1 (3.8%)	1.000

*Patients whose Basal Barthel Index Score was <30 were not included in the analysis (n = 20).

ring admission compared with their basal situation. Furthermore, in addition to the relation between basal and admission physical situations with lower BI values, the change in BI during admission compared with the basal situation showed a greater decline in non-survivors compared with that of survivors.

We found no adequate ED studies that define the prognosis of serious infection in geriatric patients. Because an important portion of the present data is formed by the research which has been carried out in adult and geriatric heterogeneous populations, the applications of findings to geriatric patients are less valid (13). Developing prognostic scoring scales for geriatric patients is crucial because the number of people in this age group has increased along with the frequency of admissions secondary to fever and infection (14).

In this patient group, alterations in physiological parameters are scrutinised in studies carried out in order to predict the potentially poor prognoses. Chung and colleagues stated that to evaluate 30-day mortality, the following parameters defined as Geriatric Fever Scoring can be used: leucocytosis (≥12.000/mm^3), serious coma (Glasgow Coma Score ≤8) and thrombocytopenia (≤150.000/mm^3) (15). Caterino and colleagues identified the following independent determinants of 28-day mortality in geriatric patients admitted to the ED for infection: respiration rate > 20/min or hypoxemia, heart rate ≥120 beats/min, systolic blood pressure < 90 mmHg or lactate ≥4 despite fluid therapy, the presence of concomitant terminal disease and thrombocyte count < 150,000/mm^3 (16).

Nonetheless, some studies have found that the functional situations of patients should also be taken into consideration, together with evaluation of comorbidities and physiological measurements, in order to predict patient outcomes such as mortality (17). Rozzini and colleagues reported that in a geriatrics department, a distorted functional status as a result of acute disease has clinical importance and should be evaluated together with negative prognostic factors (11). Alarcón and colleagues emphasise that moderate and high BI values in patients staying in a geriatrics unit increases in-hospital mortality, hospitalisation period and readmissions after discharge (18). Narain and colleagues found that distortions in functional physical state as a result of acute disease were related to 6-month mortality in geriatric patients (19). Covinsky and colleagues stated that evaluation of activities of daily living provides more information than routine physiological measurements and comorbidities evaluations, which are used to determine prognosis; hence, these functional evaluations should be used together with other data (20). Leung and colleagues, showed that walking with or without help as a physical activity is an independent determining factor of the duration a hospital stay (21).

In contrast to these studies, given that there are limited numbers of studies on the topic, Caterino and colleagues, in a study of geriatric patients with suspicion of infection who were admitted to the ED, investigated the relationship between functional state and complicated clinical situations such as hospital mortality, need of intensive care, deterioration in clinical situation of the septic patients within 48 hours, and concluded that although functional state does not predict complicated clinical situations, critical factors such as immunosuppression, systolic blood pressure, pulse, metabolic acidosis, serious sepsis and septic shock have important prognostic value for these patients (22). However, in this study, primarily the level of activities of daily living during admission to the ED was taken into consideration, and overall change in level of activity of daily living was calculated. Nonetheless, the point stressed in Rozzini's and our study was that basal and admision BI change can predict mortality and deterioration (11), (23).

In a study conducted by Meurer and colleagues, an increase was detected in the 90-day mortality risk of geriatric patients who had serious infection potential and were admitted to the ED. In survivor patients, temporary distortions in functional state were observed, and their daily physical activity situation in the pre-morbid period was reported to have no de-



tectable influence on 90-day mortality risk (24). Moreover, in our research, after treating and removing the cause of fever, the survivors gained their previous functional capacities back within 1 month. That indicates, physical functional capacity may return to basal levels again after the cause of the fever is identified (for example, the pathogens or bacteria that cause pneumonia or urinary tract infections) and appropriately treated.

First admission points to the healthcare of patients complains fever at geriatric age groups are usually the ED's. In addition, a distinct reduction in functional capacity occurring in geriatric patients with a high fever may mislead clinicians in their evaluation of patients. Especially the fact that emergency medicine physicians are capable of measuring the functional loss between basal and admission can be an important parameter both in predicting mortality and evaluating response to treatment. The fact that there are significant differences between basal BI scores and admission BI scores indicate that these values can be used in the prognosis of patients similar to physiological and laboratory data. For this reason, we believe that BI can be used as an objective evaluation tool by ED physicians for predicting mortality in geriatric patients. A limitation of our research is that we did not evaluate the effects of the cognitive and psychological states of patients on their prognosis.

In conclusion, fever increases the physical dependency of geriatric patients. A functional scoring test such as BI for prognostic purposes can be used during evaluations of geriatric patients admitted to ED with a high fever. Situations causing a serious increase in functional dependency during admission compared with a patient's basal situation can be related to short-term mortality in geriatric patients.

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RESEARCH

AGE-AND SEX-RELATED DIFFERENCES IN PHYSICAL FITNESS AND PHYSICAL ACTIVITY LEVELS OF THE PHYSICALLY INDEPENDENT COMMUNITY-DWELLING OLDER ADULTS

ABSTRACT

Introduction: The aim of the study was to assess health-related physical fitness and physical activity levels of young elderly (60–69 years) and old elderly (70–80 years) people and to show the differences with age and gender.

Materials and Method: The level of physical activity was evaluated using the International Physical Activity Questionnaire(IPAQ-short) and each participant completed a battery of health-releated physical fitness tests adapted from ALPHA-FIT test batteries.

Results: A sample of 143 participants aged between 60 to 80 years, of which 70 were in young elderly group (60-69 years) and 73 were in old elderly group (70-80 years) was recruited. One leg stand, figure of eight walk and shoulder neck mobility showed a statistically significant difference ($p<0.05$) between young elderly (60–69 years) and old elderly women (70–80 years). But there is no statistically significant difference in the distance of six minute walk test for the cardiorespiratory fitness between young elderly and old elderly women. Hand grip and shoulder neck mobility showed a statistically significant difference ($p<0.05$) between age groups. In the body composition, no statistically significant difference were observed between two age groups in the waist circumference and BMI regardless of gender. There is no statistically significant difference in the total score of physical activity between young elderly and old elderly men. But a significant difference ($p<0.05$) between young elderly and old elderly women was found.

Conclusions: Our results indicate that women had much more decreased physical fitness and physical activity level with age.

Key Words: Physical Fitness; Physical Activity; Aging; Gender.

ARAŞTIRMA

FİZİKSEL OLARAK BAĞIMSIZ TOPLUM İÇİNDE YAŞAYAN YAŞLI BİREYLERİN FİZİKSEL UYGUNLUK VE FİZİKSEL AKTİVİTE DÜZEYLERİNDE YAŞA VE CİNSİYETE BAĞLI FARKLILIKLAR

ÖZ

Giriş: Bu çalışmanın amacı, genç yaşlıların (60-69 yaş) ve daha yaşlı (70-80 yaş) bireylerin sağlığa bağlı fiziksel uygunluk ve fiziksel aktivite düzeylerini değerlendirmek ve yaşa ve cinsiyete bağlı farklılıkları göstermektir.

Gereç ve Yöntem: Çalışmaya 70'i genç yaşlı grubunda (60-69 yaş) ve 73'ü daha yaşlı grupta (70-80 yaş) olmak üzere 60 ile 80 yaş arası 143 katılımcı dahil edildi. Fiziksel aktivite düzeyi Uluslararası Fiziksel Aktivite Anketi (IPAQ-kısa form) kullanılarak değerlendirildi ve her bir katılımcıya ALPHA-FIT test bataryasından uyarlanan sağlığa bağlı fiziksel uygunluk testleri uygulandı.

Bulgular: Genç yaşlı (60-69 yaş) ve daha yaşlı kadınlar (70-80 yaş) arasında tek ayak üzerinde durma, sekiz şekli yürüyüş ve omuz boyun mobilite testi sonuçlarında istatistiksel olarak anlamlı bir fark bulundu ($p<0.05$). Fakat kardiyorespiratuar uygunluk için, genç yaşlı ve daha yaşlı kadınlar arasında altı dakika yürüme testi sonucunda istatistiksel olarak anlamlı bir fark bulunmadı. El kavrama ve omuz boyun mobilite testlerinde yaş grupları arasında istatistiksel olarak anlamlı bir fark bulundu ($p<0.05$). Vücut kompozisyonunda, cinsiyet ne olursa olsun her iki yaş grubu arasında bel çevresi ve vücut kitle indeksi sonuçlarında istatistiksel olarak anlamlı fark gözlenmedi. Genç yaşlı ve daha yaşlı erkekler arasında fiziksel aktivite toplam puanı arasında istatistiksel olarak anlamlı bir fark yoktu. Ama genç yaşlı ve daha yaşlı kadınlar arasında anlamlı bir fark bulundu ($p<0.05$).

Sonuç: Elde edilen sonuçlar kadınların yaşla birlikte fiziksel uygunluk ve fiziksel aktivite düzeyinin daha fazla azaldığını göstermektedir.

Anahtar Sözcükler: Fiziksel Uygunluk; Fiziksel Aktivite; Yaşlanma; Cinsiyet.

Introduction

Aging is a genetically determined, inevitable process that varies by acquired damage and immunological reactions. Active ageing and the factors that influence this process are important. Analysis of the primary factors influencing active ageing can help develop effective and preventive interventions that allow older adults to maintain an active and healthy life. Physical activity (PA) and physical fitness (PF) are key factors that influence active ageing (1,2).

PF plays a vital role in the health and independence of older adults (3), although it is traditionally associated with young through middle-aged populations. However, the growth of aging population means that it is important for older adults to maintain adequate muscle strength, flexibility, balance and aerobic endurance to accomplish everyday tasks (4). Assessing health-related PF is also important for determining health status.

A decline in the functional status and PA levels is often observed with ageing. Strength, endurance and flexibility problems indicate deterioration in functional health in sedentary older adults, who must therefore expend more effort to perform normal daily activities. PA is important for independent living, prevention of chronic health problems and good quality of life in older adults (4,5).

Globally, the number of older adults is continuously increasing. It has also been estimated that by 2050, 20.8% of Turkey's total population will be elderly. This has been attributed to the increasing life expectancy: in 1980, the average terminal age for Turkish adults was 58 years, while in 2050, it is expected to be 79 years The population of older adults in Turkey is growing rapidly, and Turkey is expected to have the largest older population among all European countries in 2050 (6). This increase in the number and proportion of older adults means that clinicians need more information about factors that influence the continued health of older adults.

There have been numerous studies on the general functioning of older adults and the effects of PA on older adults' health, but there is little published data available in Turkey on the multiple components of PF or PA levels (e.g. intensity, duration and frequency) for older adults in different age groups (4,6). There has recently been increased interest in the importance of PA and PF levels of Turkish older adults with the ageing population, highlighting the importance of gathering this information.

In the present study, we aimed to assess health-related PF and PA levels of older adults a younger elderly group aged 60–69 years and an older elderly group aged 70–80 years and to identify the differences in health-related PF and PA by age and sex.

Materials and Method

Participants

Participants were recruited from Turkey's Ankara Yenimahalle municipality by public notices announcing that physiotherapists would be available to evaluate the health of older adults in a public park. In total, 172 older adults applied to participate. The health status of participants was determined using the health status measurements, including resting blood pressure, heart rate, respiratory rate and body mass index (BMI). A questionnaire about PA and PF tests were conducted with participants that were physically independent (able to walk 10 metres without rest or assistance). As there were potential health risks associated with the PF tests, we excluded participants who had any cardiorespiratory diseases or symptoms. Also older adults with cognitive disorders, who were living in nursing homes were excluded. The final study sample was 143 participants aged between 60 and 80 years (Figure 1). 29 participants were not meeting inclusion crite-

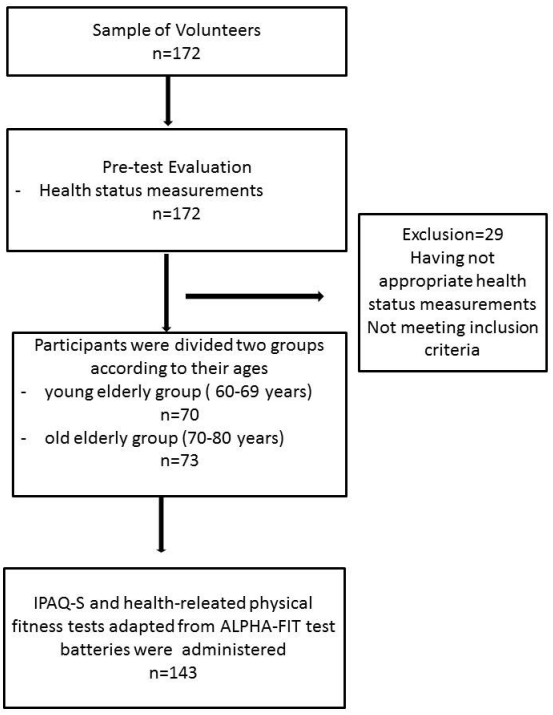


Figure 1— Enrollment of the study.



ria. 17 particitipants had inappropriate health status measurements and 12 participants were dependent on the assistance of a support device (eg, cane, crutch) for walking. The present study was approved by the Ethics Committee of the Turgut Özal University and was performed in accordance with the Declaration of Helsinki. All participants were fully informed of the potential risks and benefits of participation in the study, and gave informed consent to participate.

Testing Procedure

Participants provided general demographic information, completed the short form of International Physical Activity Questionnaire (IPAQ-S) and completed a battery of health-related PF tests adapted from the ALPHA-FIT Test Battery (7). After a general warm-up exercise consisting of 3 min of easy walking and easy lower- and upperbody stretching exercises, the tests were administered in the following order to minimize the effects of fatigue: one-leg stand test, shoulder-neck mobility test, figure-of-eight walk test, hand grip strength test and sit and reach test. After a 5-min break, six-minute walk test was administered. Approximately 45 minutes took to make all the assessments in one participant. Standardized instructions were given to all participants and all examiners were trained about the assessments and tests. All tests were repeated to minimise errors, and the best score of the two test trials was used to evaluate performance.

International Physical Activity Questionnaire (IPAQ)

IPAQ was developed as an instrument for cross-national PA assessment and for standardising the measures of health-related PA population behaviours in different countries and sociocultural contexts. The IPAQ is used to assess habitual PA during the past 7 days. In the present study, we used the Turkish version (8) of the IPAQ short form (IPAQ-S), administered by interview. Time spent in each activity category was derived by multiplying the number of days per week with the minutes per day spent doing the activity, while total weekly PA (metabolic equivalent [MET]-Min week-1) was calculated by multiplying the number of minutes spent in each activity category with the MET score for each activity. Total weekly PA was estimated by weighting the reported minutes per week in each activity category by a MET energy expenditure estimate assigned to each category (8).

The ALPHA-FIT Test Battery

The ALPHA-FIT Test Battery for adults was developed as a part of the project ALPHA (Assessing Levels of Physical Activity and fitness at population level), funded by the European Commission. ALPHA aimed to provide a set of evidence-based instruments to assess the levels of PA and fitness in a comparable way within the European Union. The test battery consists of valid, reliable, manageable and secure field tests that can be used to monitor population health. The tests are based on scientific evidence from currently available international transversal and longitudinal research (7).

We used hand grip strength test, sit and reach test and shoulder-neck mobility test for the evaluation of musculoskeletal fitness. For the assessment of motor fitness, one-leg stand test and figure-of-eight walk test were used. To evaluate the body composition and cardiorespiratory fitness, the measurement of waist circumference, BMI and six-minute walk test were used, respectively.

Statistical Analyses

All statistical analyses were performed with SPSS 15 (Chicago,SPSS Inc.). Kolmogorov–Simirnov/Shapiro–Wilk tests were used to investigate the normality of distribution for the continuous variables. Descriptive statistics were calculated as the mean ± standard deviation (SD) for continuous variables and the number of patients and percent (%) for categorical variables. A Mann–Whitney U test was used to compare the outcomes of measurements between the younger and older groups. A correlation analysis using Spearman's correlation was conducted to examine the relationship between fitness test outcomes and PA level. $P<0.05$ was regarded as statistically significant.

RESULTS

Of the 143 participants, 61 were male (42.7%) and 82 were female (57.3%). Participants were divided into a younger group aged 60–69 years and an older group aged 70–80 years. Demographic and other participant characteristics are presented in Table 1.

When musculoskeletal and motor fitness levels for females were compared, a statistically significant difference was found ($p<0.05$) between females in the young and older groups for one leg stand, figure-of-eight walk and shoulder-neck mobility.

In terms of the musculoskeletal and motor fitness levels of male participants, hand grip and shoulder-neck mobility showed statistically significant differences ($p<0.05$) between the two age groups.

Table 1— Demographic Characteristics of the Participants (mean±sd)

	Men		Women	
Characteristics	**60-69 (n=30)**	**70-80 (n=31)**	**60-69 (n=40)**	**70-80 (n=42)**
Age (years)	64.63±3.20	71.72±1.72	63.10±2.95	73.14±3.50
Marital Status, n (%)				
Single	6 (20.0)	10 (32.2)	4 (10.0)	10 (25.0)
Married	24 (80.0)	21 (67.8)	36 (90.0)	30 (75.0)
Smoking, n (%)				
Current Smoker	4 (13.4)	-	8 (20.0)	-
Non-smoker	13 (43.3)	11 (35.5)	25 (62.5)	42 (100.0)
Former smoker	13 (43.3)	20 (64.5)	7 (17.5)	-
Occupation, n (%)				
Retired	20 (66.7)	26 (83.9)	17 (57.5)	12 (28.5)
House wife	-	-	23 (42.5)	30 (71.4)
Worker	10 (33.7)	5 (16.1)	-	-

No statistically significant differences were observed between the age groups in waist circumference and BMI for either sex. However, average BMI values indicated that both males and females in both age groups tended to be overweight (BMI>25). The PF parameters for the study sample by sex and age group are shown in Tables 2 and 3.

There was no statistically significant difference found in the total PA IPAQ-S scores for males between the younger and older groups. However, a significant difference ($p<0.05$) was found in total PA scores for females between the younger and older groups, indicating that there was a significant decline in total PA score between younger and older females ($p<0.05$). A moderate PA level was more common than a low PA level for both males and females, regardless of age, and no male or female participant reported a high PA level. The total PA scores and PA-level categories for the study sample by sex and age group are presented in Tables 4.

Investigation of sex-related differences in PF parameters found that there were statistically significant differences in the figure-of-eight walk, sit and reach test, hand grip and

Table 2— Differences in the Physical Fitness Parameters in Men and Women within Age Categories of 60–69 and 70–80 Years (mean±sd)

	Men			Women		
Physical Fitness	**60-69**	**70-80**	**p**	**60-69**	**70-80**	**p**
Musculoskeletal Fitness						
Hand grip-right (kg)	38.5±7.1	37.8±1.0	0.401	23.2±6.8	20.4±3.5	0.062
Hand grip-left (kg)	35.9±6.6	38.6±1.5	**0.002***	21.4±5.5	20.4±4.4	0.813
Shoulder-neck mobility-right (cm)	10.1±5.8	8.2±10.0	**0.023***	6.2±6.6	14.6±10.1	**0.000***
Shoulder-neck mobility-left (cm)	13.1±10.2	10.5±6.1	0.567	10.5±8.5	19.3±11.7	**0.001***
Sit-reach (cm)	12.3±13.7	8.9±10.3	0.426	21.2±8.0	18.8±6.5	0.125
Motor Fitness						
One-leg-stand (seconds)	55.1±18.2	45.0±7.7	0.075	47.3±17.1	30.8±19.4	**0.001***
Figüre-of-eight walk (seconds)	5.9±0.9	6.1±0.9	0.295	6.6±1.8	8.2±4.3	
Body Composition						
Waist circumference (cm)	98.2±6.2	98.5±4.3	0.717	97.0±10.9	99.7±9.9	0.296
Body mass index (kg/m^2)	26.2±3.4	26.7±1.2	0.181	28.7±4.4	27.5±3.4	0.504
Cardiorespiratory Fitness						
Six-minute walk (m)	561.6±165.6	540.5±81.6	0.445	531.8±149.0	494.6±99.1	0.175



Table 3— Differences in the Physical Fitness Parameters in Men and Women within Same Age Categories (mean±sd)

	60-69			70-80		
Physical Fitness	**Men**	**Women**	**p**	**Men**	**Women**	**p**
Musculoskeletal Fitness						
Hand grip-right (kg)	38.58±7.12	23.20±6.85	**0.000***	37.83±1.08	20.43±3.56	**0.000***
Hand grip-left (kg)	35.90±6.64	21.45±5.51	**0.000***	38.67±1.52	20.46±4.49	**0.000***
Shoulder-neck mobility-right (cm)	8.26±10.11	6.25±6.66	0.645	10.17±5.83	14.69±10.10	0.201
Shoulder-neck mobility-left (cm)	13.17±10.24	10.56±8.53	0.218	10.50±6.18	19.31±11.73	**0.005***
Sit-reach (cm)	9.03±10.31	21.44±8.09	**0.000***	11.83±13.34	20.00±6.41	**0.016***
Motor Fitness						
One-leg-stand (seconds)	45.17±18.29	47.37±17.19	0.771	55.00±7.77	30.80±19.48	**0.000***
Figüre-of-eight walk (seconds)	5.93±0.92	6.65±1.87	**0.001***	6.17±0.91	8.23±4.32	**0.000***
Body Composition						
Waist circumference (cm)	98.29±6.23	97.02±10.99	0.410	98.50±4.31	99.71±9.95	1.000
Body mass index (kg/m^2)	26.21±3.43	28.77±4.44	**0.030***	26.75±1.29	27.59±3.48	**0.039***
Cardiorespiratory Fitness						
Six-minute walk (m)	561.68±165.6	531.80±149.0	0.370	540.50±81.64	494.64±99.19	0.099

Table 4— Difference in IPAQ-S Parameters in Men and Women within Age Categories of 60–69 and 70–80 Years (mean±sd)

	Men			Women		
Physical Fitness	**60-69**	**70-80**	**p**	**60-69**	**70-80**	**p**
Total Physical Activity (MET)	1015.20±839.76	757.10±361.84	**0.127**	1015.20±839.76	757.10±361.84	**0.127**

	60-69			70-80		
	Men	**Women**	**p**	**Men**	**Women**	**p**
Total Physical Activity (MET)	1015.20±839.76	757.10±361.84	**0.127**	1015.20±839.76	757.10±361.84	**0.127**

	Men		Women	
Physical Actvity Categories, n(%)	**60-69**	**70-80**	**60-69**	**70-80**
Low level	8 (26.7)	11 (35.5)	6 (15.0)	17 (40.48)
Moderate level	22 (73.3)	20 (64.5)	34 (85.0)	25 (59.52)

BMI scores between males and females in the younger group (60–69 years); males performed better in the upper-lower body strength and dynamic balance tests, but women performed better in the flexibility test. In addition, females tended to be more overweight than men. Similar results were observed between males and females in the older group (70–80 years).

Discussion

The findings of the present study showed that static and dynamic balance, flexibility and the level of PA decreased with age in females, while only upper body strength and flexibility decreased with age in males. Our findings also showed no significant change in cardiovascular fitness and body composition with age. This suggests that males, regardless of age, tend to have better fitness and PA levels than females.

In general, five specific components are used to define fitness: muscle strength and endurance, flexibility, body composition, aerobic endurance and balance (1,9). Our study measured all of these PF components. The skeletal muscle changes of ageing affect the functional capacity of muscles, and maximum isometric muscle strength decreases. The reduction in static force is significant after a person reaches 60 years of age;

by the age of 70–80 years, a healthy older adult has 20–40% less static and dynamic force than a young adult (10). Previous studies have reported that the strength of the upper limbs decreases with ageing in both males and females (11). However, our findings showed that the decline in hand grip test scores with age was only significant for males. Rantanen et al. (12) and Bassey (13) found a mean upper limb strength loss of 2% per year for 221 British females aged 65 years and over, while our results found no significant difference in the upper-limb strength of females between the younger and older groups. As our study sample included a number of females that reported they were housewives, it may be that the upper body strength necessary for many common housework tasks (e.g. actions such as hand gripping and lifting) positively affected their upper limb strength and slowed the reduction in muscle strength.

The normal BMI range is recommended to be 18–24 for the general population, with a range of 19–26 accepted as appropriate for people aged 65 years and over (9). In addition, it is often considered to be better for an older adult to have a BMI between 25 and 27, rather than below 25, as a slightly higher BMI may help to protect older adults from osteoporosis (14). In our study, the average BMI values were slightly higher than the recommended range for both males and females.

Hawkins and Wiswell (15) reported a loss of aerobic capacity of nearly 10% per decade. However, our findings showed no change in aerobic capacity with age in both females and males. This result may be explained by the moderate PA level reported by approximately two thirds of our participants (male and female), regardless of age. PA level is important for cardiovascular fitness, and can slow the rate of decline in aerobic capacity. In addition, both male and female participants in our study (regardless of age) walked farther than predicted by the regression equations developed by Enright and Sherrill (16) (male participants aged 60–69 years: 561 m, male participants aged 70–80 years: 540 m (predicted 476 m); female participants aged 60–69 years: 531 m, female participants aged 70–80 years: 494 m (predicted 409 m).

Balance is important in safely performing many of the daily activities that allow older adults to continue to be independent in their community. In our study, scores for the one-leg-stand were higher than the normative scores (9,17). However, our finding that balance test results decreased significantly after the age of 70 years, especially for females, was consistent with the findings of the study by Chen et al (9).

Brach et al. (18) reported a significant relationship between PA over a 14-year period and current functional level in elderly women. In addition, studies measuring the PA of older people have reported that regular PA is effective in reducing the risk factors for, and may potentially avoid, functional deterioration associated with ageing (2,19). Therefore, PA has an important role in maintaining PF. If older adults do not have physically active lifestyles, they expose themselves to the risk of muscle mass reduction and joint motion limitation (20). In our study, females that showed decreased motor and musculoskeletal fitness with age also had significantly decreased PA levels with age.

Our finding that females performed better in flexibility tests is consistent with the findings of King et al. (20) who investigated people aged 65 years and older and found that males had better endurance and strength scores for upper, lower and body tests, while females had better scores in flexibility tests. Demura et al. (21) tested people aged 60–89 years and found that females had lower scores than males in whole strength tests in every age group; females had higher scores in flexibility tests; there were no sex-related differences in body balance. Misic et al. (22) investigated PF in subjects aged 60–98 years, and found that males had higher scores in endurance and strength, while females scored better in coordination, balance and flexibility tests. According to these studies, we can assume that in general: males score better in aerobic endurance; dynamic balance and upper, lower, and body strength tests; females have a higher level of upper, lower and body flexibility and there are no sex-related differences in body balance values. Overall, our findings are consistent with these general assumptions, with males performing better on upper-lower body strength and dynamic balance but females performing better on flexibility tests. This suggests that the commonly-observed typical differences in the PF profiles of young adults do not disappear in older adults.

Our study had some limitations that should be noted. Firstly, we used the IPAQ-S to measure the PA levels. This self-report PA measure may be limited by factors such as social desirability, recall bias and variations in cognitive and memory processes dependent on factors including age, education and sex. Instruments such as accelerometers and pedometers are technically more reliable and objective methods of assessing PA. In addition, we have recruited our study population by public announcements and made the assessments in a public park. This might have caused a bias on the population we have studied. We have probably selected more extrovert, physically healthy, active and more interested, uninhibited elderly. Although we have a good number of participants, the



recruited population does not represent all of the elderly and we cannot provide a comprehensive health-related PF and PA level profile of Turkish older adults based on 143 participants. However, our results provide information about Turkish older adults that may help in designing rehabilitation programmes that include interventions to protect and improve health and independence of older adults.

In conclusion, our results indicate that females experience significantly greater decreases in PF and PA level with age. Rehabilitation programmes and interventions to support the health and independence of older adults should consider sex- and age-related differences in physical fitness and activity.

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RESEARCH

COMPUTED TOMOGRAPHY FINDINGS IN GERIATRIC TRAUMA PATIENTS WHO ADMITTED TO EMERGENCY ROOM (SERVICE)

ABSTRACT

Introduction: The risk of geriatric individuals suffering trauma has increased due to the increasing elderly population and participation in more active social lives as a result of the improvement in health status. For rapid evaluation of trauma patients by emergency services, in many organ systems, multi detector computed tomography has been replaced with conventional graphics.

Materials and Methods: Computed tomography studies of geriatric patients who applied to the emergency service of a tertiary care hospital because of trauma between February 2013 and February 2014 were analyzed in terms of radiopathological findings associated with trauma. The results were examined in comparison with the literature.

Results: A total of 200 patients were enrolled, including 112 men and 88 women in the study. The mean age of the males was 75.5 and females was 75.9. Depending on the radiological findings, the number of affected anatomic regions as well as the type of trauma findings were noted. The most frequent types of trauma were falling (172 patients; 86%) and traffic accident (28 patients; 14%) respectively. The radiological findings were negative on half of (48%) the computed tomography examinations performed.

Conclusion: High rates of negative radiological findings cause cost and labor loss as well as unnecessary radiation exposure. Excessive labor in emergency services and physicians' malpractice concerns may have promoted the increased use of radiological examinations. During management of geriatric trauma patients, decisions regarding computed tomography should depend on guidelines based on further studies that stratify patient risk and consider cost effectiveness.

Key Words: Trauma; Computed Tomography; Geriatric.

ARAŞTIRMA

ACİL SERVİSE BAŞVURAN GERİATRİK TRAVMA HASTALARINDA BİLGİSAYARLI TOMOGRAFİ BULGULARI

ÖZ

Giriş: Yaşlı nüfusun artması, sağlık uygulamalarındaki iyileşme sonucu yaşlı bireylerin toplumsal yaşama daha aktif katılması gibi nedenlerle yaşlı hastalar travmaya daha fazla maruz kalmaktadır. Günümüzde acil servislerde travma hastalarının hızla değerlendirilmelerinin sağlanması amacıyla bir çok organ sisteminde konvansiyonel grafilerin yerini çok kesitli bilgisayarlı tomografi almıştır.

Gereç ve Yöntem: Şubat 2013-Aralık 2014 tarihleri arasında acil servise travma nedeniyle başvuran geriatrik olguların bilgisayarlı tomografi görüntüleri travmayla ilişkili radyopatolojik bulgular açısından analiz edildi ve sonuçlar literatür eşliğinde irdelendi.

Bulgular: Çalışmaya 88'i kadın 112'si erkek olmak üzere toplam 200 hasta dahil edildi. Yaş ortalaması erkeklerde 75.5 kadınlarda 75.9'du. Radyolojik olarak travma bulgusu saptanan anatomik bölgelerin sayısı ve etkilenme bulguları tespit edildi. En sık travma oluş şekli sırasıyla düşme (172; %86) ve trafik kazasıydı (28 hasta; %14). Bilgisayarlı tomografi incelemelerinin yarısında (%48) radyolojik bulgu yoktu.

Sonuç: Radyolojik bulgu saptanmama oranının yüksekliği maliyet ve iş gücü kaybı ile birlikte gereksiz radyasyon maruz kalımına sebep olmaktadır. Acil servislerdeki aşırı iş yükü ve hekimlerin malpraktis kaygıları radyolojik inceleme sayısındaki artışa neden olmuş olabilir. Geriatrik travma hastalarının yönetimi sırasında bilgisayarlı tomografi çekilmesine karar verme aşamasında; hastaların taşıdığı risk ve maliyet etkinlik durumunu araştıran ileri çalışmalar sonucu oluşturulacak kılavuzlara ihtiyaç vardır.

Anahtar Sözcükler: Travma; Bilgisayarlı Tomografi; Geriatri.

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Introduction

Nearly eight percent of the Turkish population is geriatric, a classification defined by the World Health Organization as those individuals who are older than 65 years of age (1). The proportion of geriatric patients is expected to increase as the living standards and healthcare improve. Geriatric individuals are at an increased risk for trauma due to the increasing elderly population and their more active social lives because of the improving health status. Trauma is the 5th leading cause of death for individuals over the age of 65 years with falls, traffic accidents, and burns being the most common types of trauma (2).

Trauma-related complications in the geriatric age group appear more frequently due to weakening of self-protection during trauma, avoiding trauma as a result of metabolic, physiological, and physical changes that occur during the aging process. To quickly evaluate geriatric trauma patients in the emergency setting, computed tomography (CT) has been replaced with conventional graphics. Developments in multi-detector computed tomography (MDCT) technology has recently provided a basis for faster scan volume, thinner collimation, and polyhedral, isotropic, and three-dimensional imaging techniques in routine use. These gains allow multiple organ systems to be evaluated simultaneously with high sensitivity, which is particularly useful for fractures and solid organ damage.

Traumatic events in the geriatric population are associated with a high risk of mortality and morbidity, and therefore, have important judicial and economic implications. Therefore, geriatric trauma cases must be managed differently from trauma cases in younger adults. In this study, MDCT images of geriatric trauma patients who presented to the emergency department of a tertiary care hospital between February 2013 and February 2014 were analyzed in terms of the radiopathological findings. The results were then compared to the literature.

Materials and Method

Two hundred patients over 65 years old who presented to our emergency department because of trauma and on whom CT examinations were performed between February 2013 and December 2014 were included in the study. Non traumatic geriatric patients were excluded from the study. The patients' demographic features and advanced acute CT findings based on trauma were retrospectively evaluated. Age, sex, and cause of trauma were recorded. Routinely, abdominal ultrasonography was performed abdominal trauma patients. Radiography was performed limb traumas. The localization and type of acute trauma-related pathology determined with CT were evaluated by a consensus of two experienced radiologists (BK, NY). Patients who presented to the emergency department with non-traumatic injuries and scans in which evaluation was suboptimal because of excessive motion artifacts were excluded. Ethical approval of the study was obtained from the Ethics Committee of our institution (2015/03 decision 04).

CT Examination Protocol

Brain, thorax, abdomen, and extremity CTs were achieved by using a 4 detector-row scanner (HiSpeed QX/i, GE Medical Systems, Milwaukee, WI, USA). Non contrast CT was performed brain, thorax and extremity scans. Contrast CT was performed only abdomen scans.

Image Evaluation and Analysis

The CT images obtained from geriatric trauma patients were evaluated in terms of the findings of acute traumatic injuries. The Abbreviated Injury Scale (AIS) (3) was used to describe the trauma region as multiple or local. According to this scale, the body was divided into four anatomic regions; head-face and neck, abdomen, thorax, and extremities. Multiple trauma was defined as trauma in at least two regions, whereas local trauma was defined as the involvement of only one region.

Depending on the radiological findings, we noted the number of affected anatomic regions as well as the type of trauma findings. Radiological signs of injury included the following: cephalohematoma, extra-axial and/or intra-axial bleeding, parenchymal injury, edema-shift, and fractures for the head and neck; pneumothorax, hemothorax, and contusion-laceration for the thoracic region; organ damage and fracture for the abdominal region; and fractures for the extremities. Only acute traumatic pathologies were included in the analysis. Radiopathological findings for previous trauma or non-traumatic findings were not considered.

Statistical Analysis

The data were analyzed using the Statistical Package for Social Science (SPSS) for Windows 15.0. Descriptive statistics were used, and the categorical variables were stated as number (n) and percentage (%). The numeric variables were expressed as average ± standard deviation (SD).

Table 1— Gender and Age Distribution of Patients

	Male	Female
Patients' gender	112(56.0%)	88 (44.0%)
Patients' age	75.56	75.96

RESULTS

Two hundred geriatric trauma patients were included in the study. The demographic characteristics were 44% female (n=88) and 56% male (n=112) (Table 1). The mean age of the males was 75.5 and females was 75.9 (range 65–94). According to the AIS classification, radiologically detected local traumatic injuries were determined in 92 (46%) patients. In 92 (46%) patients, trauma-related radiological findings were not observed. In 16 (8%) patients, multiple traumatic findings were present. The causes of traumatic injuries included traffic accident in 28 patients (14%) and falls and crashes were responsible for injuries in 172 patients (86%). CT was performed for 200 patients and included a total of 289 areas. Among these patients, 120 CT scans revealed acute traumatic injuries; the rate of the examination-based positive radiological finding was 41.5%.

The following number of areas was scanned with CT in all patient groups: a single area in 144 patients (72%), two areas in 29 patients (14.5%), three areas in 21 patients (10.5%), and four areas in six patients (3%). The most frequently examined area was the head and neck (n=119), extremities (n=71), thorax (n=60), and abdomen (n=29). There were no radiological findings in 96 patients (48%). Radiological findings related to trauma were observed mostly in the extremities (28%) and head and neck (19%). Table 2 provides a detailed account of the anatomic locatins of traumatic injuries as detected by MDCT. Although this rate was 71.8% in the extremity group (51 of 71 patients), the rate was 48% (96 of 200 patients) for the entire group.

Table 2— Posttraumatic Radiological Findings

	Number of Patients	Rate (%)
No radiological finding	96	48.0
Head and neck trauma	28	14.0
Extremity trauma	51	25.5
Thorax trauma	13	6.5
Abdomen trauma	2	1.0
Head and neck with thorax trauma	3	1.5
Head and neck with extremity trauma	3	1.5
Head and neck with thorax and extremity trauma	2	1.0
Head and neck with thorax and abdomen trauma	2	1.0

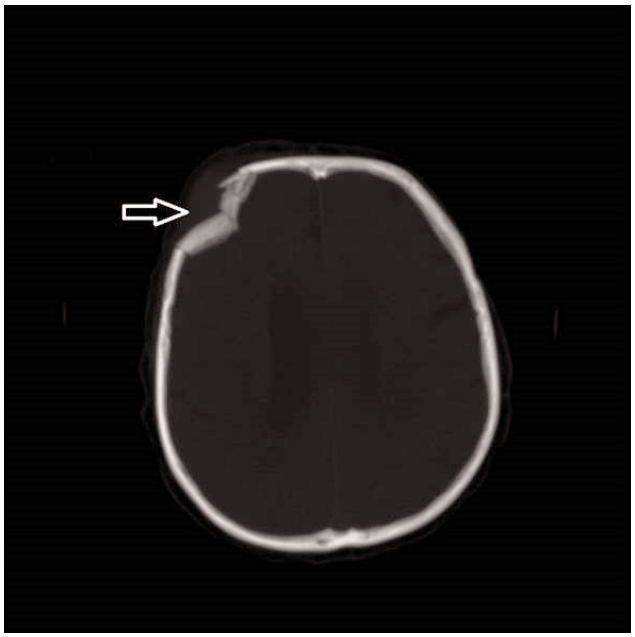


Figure 1— Compression fracture of the frontal bone.

In the head and neck trauma patient group, cephalohematoma was observed in 26 patients (13%), fracture in 22 patients (11%) (Figure 1), intra-axial bleeding and parenchymal damage in 7 patients (3.5%), extra-axial bleeding in 10 patients (5%), and brain edema and midline shift in 2 patients (1%). The regions affected by trauma and the types of pathology related to trauma are summarized in Table 3.

In the chest trauma patient group, pneumothorax was present in 7 patients (3.5%), hemothorax in 10 patients (5%) (Figure 2), parenchymal contusion/laceration in 11 patients (5.5%), and fracture in 22 patients (11%). In the abdomen trauma patient group, abdominal organ injury was present in 1 patient (0.5%) and fracture in 2 patients (1%). The extremity trauma patient group had 57 patients (28.5%) with a fracture. The extremities were the frequently affected regions by trauma because a fracture of the extremities was the most common radiological finding in all groups (Figure 3). In the traffic accident group, the rate of negative radiological fin-

Table 3— The Type of Pathology According to Trauma Site

Head and neck trauma	cephal hematomas 26 (13.0%)
	fracture 22 (11.0%)
	intraaxial bleeding-parenchymal damage 7 (3.5%)
	extraaxial bleeding 10 (5.0%)
	brain edema and midline shift 2 (1.0%)
Thorax trauma	pneumothorax 7 (3.5%)
	hemothorax 10 (5%)
	parenchymal contusion-laceration 1 1 (5.5%)
	fracture 22 (11.0%)
Abdomen trauma	abdominal organ damage 1 (0.5%)
	fracture 2 (1.0%)
Extremity trauma	fracture 57 (28.5%)

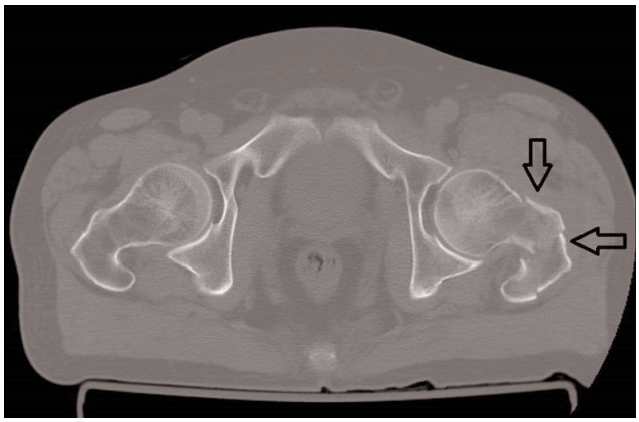


Figure 3— Femoral neck fracture on the left.

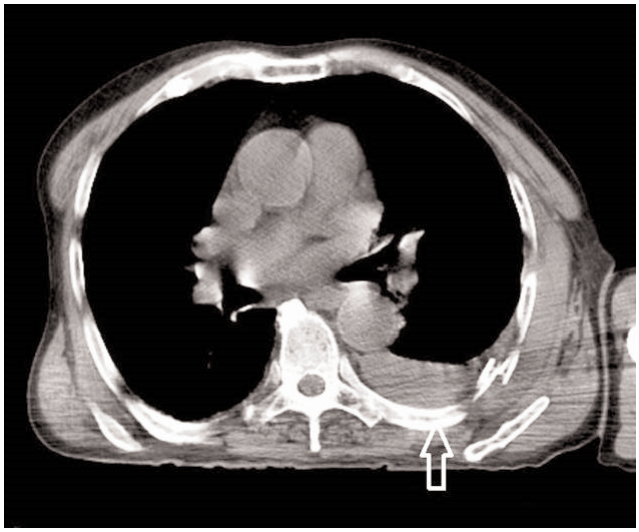


Figure 2— Left rib fractures and a hemothorax.

ding was 32.1% but 50.5% in the remaining groups. The frequently affected region was the head and neck in the traffic accident group at a rate of 46.4% (13 patients), although injury to the extremities was most frequently observed in the other patients at a rate of 28.4% (49 patients).

Discussion

Trauma is a very important part of the daily workload in emergency services. The type of trauma, mechanism of injury, and characteristics of the trauma population are the most important factors affecting the clinical course of patients. In the geriatric population, trauma constitutes 28% of all causes of death (4,5), which could be due to factors such as degenerative articular and vertebral changes, decreases in articular movements, decline in muscle support, and reduction of multiple organ reserve. In addition, a decline in the ability to deal with stress and trauma and deficiency due to disease in the organs due to aging result in higher morbidity and mortality rates in these patients after trauma than in younger age groups. We used AIS to distinguish between local and multiple trauma. Tanrıkulu et al. reported that the rate of local trauma among patients was 88.8% (6), whereas it was 46% in our study. This difference in the rates is because we evaluated only radiological findings instead of clinical findings. The type of trauma varied as per the social and cultural factors.

Present study findings represented that traffic accidents and falls are the most common causes of trauma in the Turkish geriatric population (86% falls and 14% traffic accidents). The regions most exposed to trauma in the geriatric population are the extremities [51 patients (25.5%)] and head and neck [28 patients (14%)]. Kandiş et al. (7) reported the rate of soft tissue trauma to be 49.1% and the rate of extremity trauma to be 16.1%. Similarly, Bilgin et al. (8) reported a rate of 33% for extremity trauma and 28% for soft tissue trauma. Akaoğlu et al. showed that the most injured organ was the extremity in both local and multiple trauma patients in all age groups (9). Tanrıkulu et al. reported a rate of 77% for extremity trauma, whereas the rates for head-neck trauma and multiple organ trauma were 8.6% and 11.1%, respectively. A comparison of these clinical studies shows that

although there are numerical differences, the frequently affected region is the extremity, which is consistent with our study. We suggest that the inclusion of physical examination findings to these clinical studies may have revealed this difference.

The radiological findings were negative in half of the CT examinations performed in our study. Such examinations are not only expensive but also cause labor loss as well as unnecessary radiation exposure. Excessive labor in the emergency services and physicians' malpractice concerns may have promoted the increased use of radiological examinations. Therefore, during the management of geriatric trauma patients, decisions regarding MDCT should depend on guidelines based on further studies that stratify patient risk and consider cost-effectiveness.

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Çiğdem ÇAĞLAYAN
Nilay ETİLER

RESEARCH

HEALTH OF OLDER WORKERS IN TURKEY: A FURTHER ANALYSIS OF A NATIONAL SAMPLE

ABSTRACT

Introduction: The problems associated with ageing can add to the problems of working life. The aim of this study was to compare the general and work-related health problems of workers aged 45–64 years with those of workers aged 25–44years.

Materials and Method: This study was the extended analysis of the 2010 Health Survey of Turkish Statistical Institute (TurkStat)'s cross-sectional study, representing the country. Data from 4,431 people working actively between the ages of 25 and 64 years were extracted from the micro-dataset, and 2,925 adults (aged 25–44 years) and 1,506 older workers (aged 45–64 years) were then compared in terms of health status, work-related health problems and health care utilization. Chi-square tests and logistic regression were used for the analysis.

Results: The perceived health status was worse and the types of illnesses within the last four months were more serious in older workers. The rate of chronic disease was 22.1% in adult workers and 38.4% in older workers. No difference was found in terms of work accidents and work-related diseases; however, general health problems were more frequent in older workers. The results of the additional analysis showed that living in rural areas (OR=1.38), male gender (OR=1.51), primary school or lower education (OR=2.15), being married(OR=1.85), chronic disease existence (OR=1.64), musculoskeletal system disease (OR=1.31) and cardiovascular disease (OR=2.95) were more common, and mental disorders (OR=0.53) were less common.

Conclusion: To protect and improve the health of older workers, efficient health care should be provided and national policies should be created for workplaces.

Key Words: Occupational Health and Safety; Older Workers; Cross-sectional Study; Turkey, TurkStat.

ARAŞTIRMA

TÜRKİYE'DE YAŞLI İŞÇİLERİN SAĞLIĞI: ULUSAL BİR ÖRNEĞİN İLERİ ANALİZİ

ÖZ

Giriş: Çalışanların yaş ortalaması ileri yaşlara kaymasıyla, çalışma yaşamındaki sorunlara yaşlanmanın getirdiği sorunlar eklenmektedir. Bu çalışmanın amacı, Türkiye'de 45-64 yaşındaki çalışanların genel ve işe bağlı sağlık sorunlarını 25-44 yaş çalışanlar ile karşılaştırmaktır.

Gereç ve Yöntem: Bu çalışma Türkiye İstatistik Enstitüsü (TÜİK)'nün kesitsel tipte, ülke temsiliyeti olan bir örnekte yürüttüğü, 2010 Sağlık Araştırması'nın ileri analizidir. Mikroveri setinden 25-64 yaş arası aktif olarak çalışan 4431 kişinin verileri ayrılmış ve analizlerde 2925 erişkin işçi (25-44 yaş) ile 1506 yaşlı işçinin (45-64 yaş) çeşitli özellikleri, genel sağlık durumu, işe bağlı sağlık sorunları ve sağlık hizmet kullanımı açısından karşılaştırılmıştır. Analizlerde ki-kare testleri ve lojistik regresyon analizi yapılmıştır.

Bulgular: Yaşlı işçilerde hem algılanan sağlığın daha kötü olduğu hem de son dört haftadaki rahatsızlığın daha ciddi olduğu saptanmıştır. Erişkin işçilerde kronik hastalık sıklığı %22.1 iken yaşlı işçilerde %38.4'dır. İş kazası ve işten kaynaklanan hastalık sıklığı açısından iki grup arasında fark yokken, genel sağlık sorunları yaşlı işçilerde daha sıktır. İleri analiz sonuçlarına göre, yaşlı işçilerde kırda yaşama (OR=1.38), erkek cinsiyet (OR=1.51), ilkokul ve altı öğrenim düzeyi (OR=2.15), evli olmak (OR=1.85), kronik hastalık varlığı (OR=1.64), kas-iskelet sistemi hastalığı (OR=1.31) ve kalp-damar hastalığı (OR=2.95) daha fazla iken ruhsal rahatsızlık (OR=0.53) daha azdır.

Sonuç: Çalışma yaşamında yaşlı işçilerin sağlığının korunması ve teşviki için işyerlerinden başlayan etkili bir sağlık hizmeti sağlanması ve ulusal politikaların oluşturulması gerekmektedir.

Anahtar Sözcükler: İşçi Sağlığı ve Güvenliği; Yaşlı İşçi; Kesitsel Araştırma; Türkiye, TÜİK.

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Introduction

Demographical changes, such as the increase in life expectancy and the ageing of the population, affect the structure of the labour force. As a result, the number of older workers in the labour market has increased in developed countries (1). The number of workers aged 50 years and older increased by 50% from 1951 to 2007 and reached 20.7 million in the United Kingdom (UK) (2). Similarly, while the percentage of workers over the age of 50 years in the labour markets was 27% in 2000, it is expected to exceed 35% by 2020 (3). Because of early retirement and an increase in health care costs, in 2001, the European Union (EU) decided to increase the employment rate of people within the 55–64 years age group to 50% by 2010. Despite not achieving this goal, a significant amount of progress has been made and the employment rate of this age group increased to 46% in 2010 (4).

The increasing age of those in the labour market has brought about the need to define the concepts for the older worker or ageing worker. In the Older Workers Recommendation (1980), the International Labour Institution (ILO) defined older workers as workers who had difficulties in their work life and employment because of ageing (5). Then, the World Health Organization (WHO) Working Group on Aging and Working Capacity reached an agreement, indicating that older workers and ageing workers can be used as synonyms and that workers aged 45 years and above would be accepted as older workers (6).

Older workers worldwide increasingly wish to and need to work and earn income because of demographic, economic and political reasons even if their health status is not good. ILO data has indicated that poverty is the most important reason for the need to work, even in European countries (7). Furthermore, in the Second Assembly of the United Nations in Madrid on Ageing, it was stated that the elderly should continue to work as long as they want and can remain productive (8). All of these developments demonstrated that work life can be extended and the share of older workers in the labour force can be increased. The extension of work life requires health service requirements be established for older/ageing workers to facilitate their requirements.

According to the ILO, older workers require more health services because they experience both long-term disabilities and short-term health problems more frequently than younger workers. Moreover, among all workers, females and those people working in manual labour-based careers have more disadvantages; in particular, these groups often need health services (7).

The Madrid Plan stated that health care for elderly workers should be available. In this context, providing workplace health services can be a way to meet the needs of an increasing number of older workers and to improve the awareness of health professionals on this subject. For these reasons, the aim of our research was to identify the general and work-related health status and utilization the health service of the workers aged 45–64 years and 25–44 years in Turkey.

Materials and Method

This study was a further analysis of the 2010 Health Survey that was conducted by the Turkish Statistical Institute (TurkStat) using the cross-sectional research method.

The TurkStat Health Survey was conducted to determine the general health profiles of the individual participants. The population of the study consisted of all individuals living in houses in Turkey (9). The data were collected from a total of 20,200 people and obtained as a micro-dataset from TurkStat with official consent. The sampling of this study was comprised of 4,431 people between the ages of 25 and 65 years that had been included in the analysis and that had been extracted from the dataset; all workers were actively working. Of these people, 2,925 were in the 25–44 years age group and 1,506 were in the 45–64 years age group.

The dependent variable of the study was the health status of the workers. The self-reported data concerning health status were perceived as health, chronic diseases and physical illnesses. Perceived health status was determined to be 'very good', 'good', 'medium', 'poor' and 'very poor'. A re-categorization was made within these classifications to combine the medium and better categories into a 'having good health' classification and the poor and very poor ones into a 'having poor health' classification. Diseases diagnosed by a physician and lasting for more than six months were defined as 'chronic disease'; it was defined as feeling a physical illness within the last four weeks.

The independent variables of the study were the sociodemographic characteristics: age, gender, marital status, location, pension income and health insurance. The 'older worker' and 'adult worker' in our study were categorized as the 45–66 years age group and the 25–44 years age group, respectively.

The variables regarding worker's health services included having occupational accidents or work-related disease and absenteeism within the last 12 months.

The need for worker's health services were investigated over the application to the physician, blood pressure, blood



sugar, cholesterol measurements, detection of parasite(s)in the stool and the administration of flu vaccine variables.

The Pearson chi-square test, Fisher's exact chi-square test and trend chi-square test were all used in the univariate analyses. Logistic regression was used in the further analyses. The statistical significance was accepted as 0.05. The analyses were performed in SPSS ver 21.0.

Results

Based on the TurkStat 2010 Health Survey sample, 2,925(51.2%) out of 5,717 people in the adult workers and 1,506(35.4%) out of 4,254 people in the older workers were in labour market. Therefore, the rate of participation in the labour market was significantly lower in the 45–64 years age group than that in the adult group. This difference was also observed between the genders ($p>0.001$). The rate of participation in the labour market was 26% among females in the adult age group, whereas it decreased to 16.9% in the older workers ($p>0.001$). The same rates were 86% among males in the adult age group and decreased to 57% in the older group. Table 1 shows the characteristics for both age groups.

Of older workers, 8.3% that were included in the analysis that described their perceived health status as poor/very poor; this was significantly higher than the rate in the adult workers (3.6%). Similarly, the rate of having a chronic disease for more than six months was higher in the older group (38.4%) than that in the other group (22.1%) ($p<0.001$). Regarding the chronic diseases, the older age group had more problems with acute diseases than the adult workers. The rate of workers answering the question 'Have you felt any bodily/physical illness in the last four weeks?' with 'I have not' was 52.9% in older workers; however, it was 65.1% in the adult workers. The rate of those that felt serious or very serious discomfort was 7.9% in older workers and 5.6% in the adult workers (data not shown).

As seen in Table 2, the older workers had higher disease rates than the other age group for all chronic disease diagnoses except for stroke, chronic anxiety and depression. The most diagnosed diseases were musculoskeletal problems of the lumbar region, hypertension, gastric ulcers, rheumatic joint disease and degenerative joint disease.

While the frequency that a work-related disease had been diagnosed over the previous year was similar for both older workers (4.8%) and adult workers (4.7%), the frequency with which a disease unrelated to work was diagnosed was significantly higher in older workers (7.9% and 5.5%, respectively). There were no differences for older and adult workers in terms of occupational accidents, and older workers had fewer absences from work (Table 3).

Table 1— Sociodemographic Characteristics of the Workers By Age Groups

		25-44 Age Group n: 2,925		45-64 Age Group n: 1,506		p
		n	%	n	%	
Gender	Male	2,060	70.4	1,118	74.2	0.008
	Female	865	29.6	388	25.8	
Location	Urban area	2,155	73.7	899	59.7	0.000
	Rural area	770	26.3	607	40.3	
Marital status	Married	2,382	81.4	1,374	91.2	0.000
	Not married†	543	18.6	132	8.8	
Health insurance	No	298	10.2	141	9.4	0.384
	Yes	2,627	89.8	1,365	90.4	
Pension	No	2,769	94.7	1,366	90.7	0.000
	Yes	156	5.3	140	9.3	
Level of education	Primary school and lower (≤5 years)	1,210	41.4	973	64.6	0.000
	Primary school or secondary school	340	11.6	124	8.2	

†Single/widow/divorced

Table 2— Prevalence of Chronic Diseases By Age Groups in the Working Population

		25-44 Age Group	45-64 Age Group	Total	p
Chronic disease (disease for more than six months)	n	646	579	1,225	0.000
	%	22.1	38.4	27.6	
Thyroid disease	n	59	48	107	0.016
	%	2.0	3.2	2.4	
COPD	n	59	48	107	0.014
	%	2.0	3.2	2.4	
Infarction (heart attack)	n	13	24	37	0.000
	%	0.4	1.6	0.8	
Coronary heart disease (angina, chest pain, spasm)	n	63	86	149	0.000
	%	2.2	5.7	3.4	
Chronic cardiac failure	n	10	18	28	0.001
	%	.3	1.2	.6	
Hypertension	n	101	245	346	0.000
	%	3.5	16.3	7.8	
Stroke-paralyzed (cerebral haemorrhage, cerebral thrombosis)	n	15	11	26	0.369
	%	0.5	0.7	0.6	
Calcification (osteoarthritis, arthrosis, degenerative joint disease)	n	71	152	223	0.000
	%	2.4	10.1	5.0	
Rheumatic joint disease (rheumatoid arthritis)	n	128	154	282	0.000
	%	4.4	10.2	6.4	
Lumbar region musculoskeletal system problems (back pain, herniated disc, and other lumbar defects)	n	306	250	556	0.000
	%	10.5	16.6	12.5	
Neck region musculoskeletal system problems (neck pain, cervical disc hernia, and other neck defects)	n	124	107	231	0.000
	%	4.2	7.1	5.2	
Diabetes	n	60	124	184	0.000
	%	2.1	8.2	4.2	
Gastric ulcer	n	219	184	403	0.000
	%	7.5	12.2	9.1	
Duodenal ulcer	n	22	28	50	0.001
	%	0.8	1.9	1.1	
Chronic anxiety	n	8	4	12	1.000
	%	0.3	0.3	0.3	
Chronic depression	n	53	28	81	0.911
	%	1.8	1.9	1.8	

†Fisher test

Older workers visited both primary care physicians and specialist physicians more frequently in the last 12 months. Table 4 shows the heath care characteristics of the age groups.

The multivariate analysis results showed that the primary school and lower education level factors appeared 2.15 times (95% GA, 1.84–2.51) more in older workers than in adult workers, whereas male gender appeared 1.51 times more, being married appeared 1.85 times more and living in rural areas appeared 1.39 times more. Older workers had 1.64 times more chronic diseases, 1.31 times more musculoskeletal system diseases and 2.95 times more cardiovascular diseases, but they had fewer mental disorders (OR, 0.53). No difference was observed between the age groups in terms of perceived health status, physical illnesses over the last four weeks, having an occupational accident, developing a work-related disease or receiving services from a specialist or GP as indicated by the univariate analyses.



Table 3— Occupational Accident, Work-related Disease, and Absenteeism Status According to Age Group in the Working Population

		25-44 Age Group	45-64 Age Group	Total	p
Catching a work-related disease in the last 12 months					
Has a work-related disease	n	138	72	210	
	%	4.7	4.8	4.7	
Has a disease unrelated to work†	n	162	119	281	0.009
	%	5.5	7.9	6.3	
Does not have a disease	n	2,625	1,315	3,940	
	%	89.7	87.3	88.3	
Frequency of absenteeism due to health problems in the last 12 months					
Yes	%	428	193	621	
	n	14.6	12.8	14.0	0.01
No / I don't know	%	2,497	1,313	3,810	
	n	85.7	87.4	86.0	
Frequency of having occupational accident in the last 12 months					
Yes	n	87	38	125	
	%	3.0	2.5	2.8	0.318
No / I don't know	n	2,838	1,468	4,306	
	%	97.0	97.5	97.2	

†Group creating the difference

Table 4— Accessing Health Care By Age Group in the Working Population

	25-44 Age Group	45-64 Age Group	Total	p
Admitted to physician	%	%		
Receiving care from general practitione r (GP) or family physician(FP) in the last 12 months	41.5	47.4	43.5	0.000
Receiving care from specialist physician in the last 12 months	52.9	56.3	54.0	0.029
Not receiving health care despite the need	21.3	21.6	21.4	0.849
Medical tests or examinations				
Administration of flu vaccine in the last 2 years	8.4	6.8	7.9	0.07
Blood pressure measurement in the last 12 months	41.8	55.3	46.4	0.000
Cholesterol measurement in the last 12 months	22.8	39.0	28.3	0.000
Blood sugar measurement in the last 12 months	24.7	39.2	29.7	0.000
Parasite in stool test in the last 5 years	12.5	10.5	11.8	0.048
Stool guaiac test in the last 3 years	4.9	5.4	5.1	0.45
Prostate examination in the last 3 years*	2.3	11.0	5.4	0.000

*For males

Discussion

This study was the first study on the health of older workers and their health service needs in Turkey. This study could serve as a guide for future studies and assist in determining the status of older workers. This is because of the fact that the demographic and economic changes in Turkey will cause this issue to remain at the forefront in the future. T he study data from a sample representing the entirety of Turkey was an important advantage because the results can currently be generalized to Turkey. The sampling size also increased the power of the hypothesis tests and enabled the performance of multi-

variate analyses. However, this study does have some limitations such as it only consists of an advanced analysis of an existing database; it also did not present subject features apart from the existing variables. All the features associated with the health status of older workers may not have been revealed because of the limited number of variables. The citations provided in the paper using other studies are limited, as fewer studies regarding this topic are conducted up till now, and this is the first study conducted in Turkey.

General Health Status

The health status of older workers was worse than that of the adult workers. This was expected and consistent with the literature (6,11,12). Health status often decreases because of the physiological changes brought about by age, leading to an increase in the frequency of chronic diseases. In a study, one in five people between the ages of 55–64 years and one in four between the ages of 65–74 years described their perceived health status as medium or poor (11) in the USA. Again, in the USA, morbidity because of chronic diseases increased among older workers. In Finland, the incidence of chronic diseases increased in parallel with ageing and caused premature mortality and disabilities (6). The changes and diseases because of ageing also decreased work capacity. A systematic review study by Crawford *et al.* showed that decreases in aerobic capacity, increases in BMI, increases in chronic diseases and work-related musculoskeletal system diseases were particularly common (12). In a study conducted in several countries in Europe, the disability rates of workers in the 45–54 years age group were between 9% and 32% and for workers in the 55–64 years age group, the rates were between 15% and 40% (7). Studies in UK have indicated that chronic diseases, particularly those such as hypertension and musculoskeletal system diseases were observed more in the older age group than in younger workers (2). On the other hand, despite the physiological changes and diseases because of ageing, older workers described their health status as better than those in the same age group who were retired or not working (11). In females, it has been stated that older workers had better mental health statuses and higher life satisfaction than those who were not working (13). As seen in the studies completed either in this country or in other countries, the frequency of chronic diseases increased because of physiological changes or the age of the workers aged 45 years or older; however, working positively affected the health. Therefore, providing health promotion activities in the workplaces may be of great importance for healthier workers and a healthy working life. This study showed that older workers had more health problems than adults; however, their mental health problems were no different than those of adults.

Occupational Health Characteristics

In this study, it was determined that older workers had more health problems among those who had work-related health problems; however, they had lower absenteeism because of health problems and frequency of occupational accidents. In a study conducted in 15 EU countries, work-related musculoskeletal system diseases and psychosocial problems were detected in 40% of males and females over the age of 45 years (1). A study from UK indicated that work-related stress and burnout were most commonly observed in the 50–55 years age group and they are decreased with age. Moreover, it was stated that older female workers reported more work-related diseases because they had roles other than their working life (2). According to a study in Finland, the sectors that caused the most disabilities in older workers were mining, construction and those that involved work that caused a physical toll, whereas those that caused the fewest disabilities were law, education and management (6). In addition to the studies showing that work-related diseases were observed more in older workers than those in adult workers, there have also been studies showing that the diseases observed in workers were not because of work, but because of ageing (12). The results of the studies that compared occupational accidents and workers' ages showed some differences. As in this study, the most definite finding was that the frequency of older workers that had occupational accidents was lower than that of younger workers. This was attributed to the fact that older workers had more experience and knowledge on occupational health and safety and they often worked in less risky positions (such as executive, foreman). Nevertheless, a study showed a positive correlation between experience and occupational accident risk; experienced workers were found to take more risks (6).

It has also been stated that accident risk increased because of reasons such as changes in visual and auditory senses because of ageing or a decrease in reflexes. The most observed occupational accident types in older workers were vehicle crashes and falls (6,14). Moreover, the results of accidents may be more serious for older workers. Occupational accidents can cause serious injuries, disabilities and even death in older workers and their return-to-work periods are often longer than those of adults (2). A group of 55–65 years workers in Sweden were determined to have the lowest occupational accident rate, but experienced more serious results on average (15). The



Table 5— Characteristics of Older Workers (45-64 age) By Logistic Regression Analysis

	B	S.E.	Wald	Sig.	Exp (B)	95% C.I	
						Low	Up
Location (rural area)	.321	.075	18.094	.000	1.38	1.19	1.60
Gender (male)	.414	.083	25.089	.000	1.51	1.29	1.78
Education (Ref: high school+)			105.352	.000			
Education (PS and lower)	.765	.079	94.171	.000	2.15	1.84	2.51
Education (SS level)	.083	.124	.444	.505	1.09	0.85	1.39
Marital status (Ref: married)	.613	.109	31.804	.000	1.85	1.49	2.28
Perceived health (Ref: poor)	.155	.158	.966	.326	1.17	0.86	1.59
Has chronic disease	.495	.083	35.261	.000	1.64	1.39	1.93
Has mental disorder	-.630	.134	21.966	.000	0.53	0.41	0.69
Has musculoskeletal system disease	.270	.087	9.677	.002	1.31	1.11	1.55
Physical illness in the last four weeks (serious or very serious)	-.093	.145	.413	.520	0.91	0.69	1.21
Has cardiovascular disease	1.081	.120	81.612	.000	2.95	2.33	3.73
Received care from specialist	.009	.075	.014	.905	1.01	0.87	1.17
Received care from PP/FP	.075	.073	1.065	.302	1.08	0.93	1.25
(Had) Occupational accident in the last 12 months	-.394	.210	3.528	.060	0.67	0.45	1.02
Caught a work-related disease in the last 12 months (ref: not)			6.284	.043			
Caught a disease unrelated to work	.211	.136	2.403	.121	1.23	0.95	1.61
Caught a work-related disease	-.309	.168	3.373	.066	0.74	0.53	1.02
Constant	-1.843	.216	72.858	.000	0.16		

median return-to-work period for the 45 years and older age group was determined to be eight days, whereas it was six days for those in the 35–44 years age group (11). Studies have shown that the frequency of absenteeism irrespective of the duration was higher in younger workers than that in older workers. Our study was consistent with the literature because the frequency of absenteeism was lower in older workers. The different rates in absenteeism between older and younger workers can mostly be attributed to the sector and work. The mean absenteeism duration for the 15–24 years age group working in the construction sector in Germany was 17 days; however, this increased to 20 days for the 45–55 years age group and to 35 days for the 55–65 years age group. It was found to be 8, 15 and 19 days, respectively, for the same age groups that were working in the management sector (7).

Health Care Utilisation

This study revealed that older workers utilized health services more than adult workers. One out of five people cannot utilize health services despite their need for it in both groups. The need for health services in the workplace can be accessed with the utilization rate of health services by older workers; the percentage of those who felt acute discomfort over the last four weeks was 47.1% and of those who had any chronic disease for more than six months was 38.4%. Awareness of the importance of worker's health services in the workplace to meet the health service needs of older workers has increased around the world. Current evidence has indicated that health promotion activities in workplaces may be useful, particularly for developing the health of older workers whose physical abilities may have decreased and who were at risk for acute and chronic diseases (16). In addition, health services in the workplace were also important to ensure that the elderly keep working as long as they wish and remain productive as stated at the World Assembly on Aging in Madrid. In a study conducted in the EU, 60%–70% of workers aged 45 years and above believed that it was possible for them to work at their current jobs after the age of 60–65 years. Nevertheless, one-third of them reported that they could not keep working because of health problems and that this would cause them to leave working life earlier (1). Intervention at the workplaces has demonstrated that early retirement or leave of employment because of health problems can be prevented. Furthermore, workers can respond positively to health promotion interventions (12). Therefore, provision of an efficient health service and he-

alth promotion programs in workplaces should include some features. Features of older workers should be considered while preparing these programs. For example, the fact that older workers have poorer health than young workers may limit the health promotion programs. It has been recommended that these activities should be initiated from lower levels because older workers may have a lower tolerance for external stresses based on their decreased functional and physical capacities. However, special motivation may be necessary for older workers as it can be difficult to change established habits. A personal approach is important and requirements should be determined based on the person's age (6,17).

In conclusion, these results showed that an effective health service should be provided for older workers. To do this, the national policies should ensure that older workers can be involved in working life in a socially and politically healthy manner. In addition, national policies should also support the improvement of workplace conditions and occupational health and safety services. Workplace doctors and nurses should be educated on ageing and its effects on worker's health during both pre-graduation and post-graduation periods. Periodical medical examinations should be conducted, particularly with respect to the cardiovascular system, visual or auditory disabilities and musculoskeletal system diseases for all workers aged 45 years and older within the scope of health promotion programs. Moreover, further research should be conducted to determine the health service needs of older workers.

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RESEARCH

COMPARISON OF CLINICAL RESULTS OF BIPOLAR HEMIARTHROPLASTY FOR EXTRACAPSULAR AND INTRACAPSULAR HIP FRACTURES

ABSTRACT

Introduction: In this study, patients aged 65 years and over who were undergoing cemented bipolar hemiarthroplasty following hip fracture were divided into two groups:those with intracapsular and extracapsular hip fractures. We retrospectively compared the early-stage functionality and radiological results, perioperative complications, surgical durations and the length of preoperative and postoperative hospitalisation.

Materials and Method: The study enrolled 127 consecutive patients (aged 65 years or older) who were admitted to the Ankara Ataturk Training and Research Hospital between January 2008 and October 2011 because of intracapsular (Group 1) or extracapsular (Group 2) hip fracture and were treated by cemented bipolar partial hip replacement and followed up for at least 6 months. Modified Harris Hip score and Barthel Index of Activities of Daily Living were used to evaluate the functionality results. The success of hemiarthroplasty was evaluated using Kwok criteria.

Results: Average Harris Hip scores, postoperative Barthel Indices of the Activities of Daily Life scores, surgery durations, blood transfusion requirement and results based on Kwok criteria for the two groups were statistically significantly different ($p<0.05$). No statistically significant differences were found between the durations of preoperative and postoperative hospitalisations and the number of complications in the two groups.

Conclusion: The results demonstrate that bipolar hip replacement had better functional outcomes for intracapsular hip fractures than for extracapsular hip fractures.

Key Words: Hip Fractures; Femoral Neck; Intertrochanteric; Hemiarthroplasty.

ARAŞTIRMA

BİPOLAR HEMİARTROPLASTİ UYGULANAN İNTRAKAPSÜLER VE EKSTRAKAPSÜLER KALÇA KIRIKLARININ KLİNİK SONUÇLARININ KARŞILAŞTIRILMASI

ÖZ

Giriş: Bu çalışmada kalça kırığı sonrası çimentolu bipolar hemiartroplasti uygulanan 65 yaş ve üstü olan hastaları intrakapsüler ve ekstrakapsüler kalça kırıkları olarak iki ayrı grupta ele alındı. Retrospektif olarak erken dönem fonksiyonel ve radyolojik sonuçlar, perioperatif komplikasyonlar, operasyon süreleri, preoperatif ve postoperatif yatış süreleri karşılaştırıldı.

Gereç ve Yöntem: 2008 Ocak-2011 Ekim tarihleri arasında, 65 yaş ve üzeri intrakapsüler (Grup 1) ve ekstrakapsüler (Grup 2) kalça kırığı ile Ankara Atatürk Eğitim ve Araştırma Hastanesi'ne başvuran ve çimentolu bipolar parsiyel kalça protezi ile tedavi edilen en az 6 ay takipli toplam 127 ardışık hasta değerlendirmeye alındı. Fonksiyonel sonuçlar ise Modifiye Harris Kalça skoru ve Barthel günlük yaşam indeksi ile değerlendirildi. Hemiartroplasti uygulama tekniğinin başarısı ise Kwok kriterleri ile değerlendirildi.

Bulgular: Ortalama Harris kalça skoru, postoperatif Barthel günlük yaşam aktivite indeksi, operasyon süreleri, kan transfüzyon ihtiyaçları, Kwok kriterine göre sonuçlarda iki grup arasında istatistiksel olarak anlamlı fark bulundu ($p<0.05$). Preoperatif ve postoperatif yatış süreleri ve komplikasyonlar açısından her iki grup arasında istatistiksel açıdan anlamlı fark bulunamadı.

Sonuç: Çalışmada elde ettiğimiz bulgular ışığında bipolar hemiartroplasti; intrakapsüler kalça kırıklarında ekstrakapsüler kalça kırıklarına göre daha iyi fonksiyonel sonuçlara sahiptir.

Anahtar Sözcükler: Kalça Kırığı; Femur boynu; İntertrokanterik; Hemiartroplasti

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Introduction

Hip fractures are a major public health problem in many countries. The number of hip fractures per year is estimated to reach 2.6 million by 2025 and 4.5 million by 2050 worldwide (1). Proximal femoral fractures (PFF) are radiologically classified into two groups intracapsular (femoral neck fractures) and extracapsular (intertrochanteric and subtrochanteric) (2). As the elderly population increases, the incidence of hip fractures increases (3). Old age and a decrease in bone density, oncological or neurological diseases, visual impairments, nutrition disorders and a decrease in physical activity result in PFF. Simple falls cause 90% of femoral neck fractures in the elderly population. In women, the hormonal changes secondary to menopause shift the balance between bone construction and destruction towards the latter process. Thus, PFF occurs in women three times more frequently than in men (4).

The aim of intracapsular and extracapsular hip fracture treatment is to recover the pre-fracture functions without causing any additional morbidity. The choice of treatment method depends on the age of the patient and the type of the fracture. Partial hemiarthroplasty is a common treatment method; it allows the early weight bearing, surgery does not last long and risk of repeated surgery is low (5,6).

However, the functional outcome after partial hemiarthroplasty for hip fractures may depend on various clinical factors, including sex, age at surgery, ambulatory status, comorbidities, type of fracture, duration of fracture, haemoglobin state and albumin level (7). Apart from these factors, very limited attention has been given to the relationship between the fracture location (intracapsular or extracapsular) and functional outcome of partial hemiarthroplasty in previous researches.

Therefore, this study evaluates the relationships between the location of intracapsular and extracapsular hip fractures and functional outcomes and radiological results of cemented bipolar hemiarthroplasty.

Materials and Method

This was a retrospective comparative study of functional outcomes and radiological results of partial hemiarthroplasty for intracapsular or extracapsular hip fractures. The effects of the following independent variables were studied: sex, age, side of fracture, anaesthesia type, additional diseases, pre- and postoperative hospital stays, surgical durations, transfusion requirements, complications, postoperative Barthel Index score and postoperative Harris Hip and Kwok scores. No dependent variables were selected as comparative criteria. We enrolled 194 consecutive patients aged ≥65 years who were admitted to the Ankara Ataturk Training and Research Hospital between January 2008 and October 2011 with a diagnosis of PFF and had undergone cemented bipolar partial hip replacement. Ethical approval was obtained from the Ankara Atatürk Education and Research Hospital Ethics Committee for Clinical Researchers (approval number: 2011/11/108). The patients were categorized with respect to the type of hip fracture, and the levels of functionality, radiological results, surgery duration, blood transfusion requirement and complications were analysed. We excluded 67 patients of whom 22, who were invited via phone calls, had a history of pre-fracture cerebrovascular events and Alzheimer's disease, and 45 patients died during the postoperative period. Among the remaining 127 cases (87 females and 40 males) included in the study, 57 had an intracapsular fracture (Group 1), whereas 70 had an extracapsular fracture (Group 2). The patients were administered low-molecular weight heparin as the thromboembolism prophylaxis in the preoperative period, and this therapy continued for 15 days after the operation. Cemented bipolar hemiarthroplasty using a posterolateral approach was performed in all patients in the lateral decubitus position. Omnifit straight femoral stems were used in all patients in Group 1 and in the patients with no disruption of the calcar femorale in Group 2. Head–neck straight femoral stems with calcar support were used in patients with disrupted calcar femorale in Group 2. In nine patients (7%), whose medical condition was accompanied by a dissected trochanter major fracture, the abductor mechanism was repaired using tension bands or trochanteric grip plates. The external rotators were sutured to the trochanter major in all patients.

On postoperative day 1, after the drains and urinary catheters were removed, all patients in both the groups were mobilized using walkers with a full load, and they were assigned to the same exercise program.

The patients were followed up for at least 6 months. Garden and Orthopaedic Trauma Association (OTA) classifications were applied for types of neck and intertrochanteric fractures, respectively (4). The postoperative Barthel Index, which is a 0–20 scoring system, was used to assess the activities of daily living for the patient's current level of ability for bowel movements, bladder emptying, grooming, toilet use, transfer, mobility, dressing, stairs and bathing. The Harris Hip score, which is a 0–100 scale, was used to assess the pa-



rameters of pain, limp, support, distance walked, sitting, entering public transportation, ability to climb stairs, ability to put on shoes and socks, range of motion and absence of deformity (8,9). In addition, perioperative complications and blood transfusion requirements were considered in the study. Finally, the prosthesis fixation quality was assessed on the basis of Kwok criteria, which comprises femoral head-, neck- and stem-shaft angles and calcar replacements in X-ray graphs, as excellent, good, fair and poor (10).

Statistical analyses were performed using SPSS version 17.0 software. In comparison, the Kolmogorov–Smirnov test was performed to determine the distribution of all variable groups. Parametric and non-parametric tests were applied to the variables. In the parametric tests, Student's t-test (independent sample t-test) was used to analyse the variables with normal distribution, whereas in the non-parametric tests, the Mann–Whitney U test was used in the analyses of the variables with skewed distributions. Cross-tabulation statistics (Chi-square and Fisher) were used for comparison of categorical variables. A value of $p<0.05$ was considered to indicate statistical significance. In the correlation analyses, Spearman's correlation analysis was used.

Results

According to the Garden classification, in Group 1, five patients (8.6%) had Type I fracture; 11 (19%), Type II fracture; 25 (43.1%), Type III fracture and 16 (29.3%), Type IV fracture (Table 1). According to OTA classification, in Group 2, 13 patients (18.3%) had Type A1 fracture; 48 (69%), Type A2 fracture and nine (12.7%), Type A3 fracture (Table 2). Mean follow-up period was 13.5±2.4 months in Group 1 and 14.5±1.7 months in Group 2. There was no statistically significant difference between the sociodemographic features of patients in the two groups ($p>0.05$). In Group 1, 70% patients were female and in Group 2, 67%. Mean age was 77.30±5.58 years in Group 1 and 78.56±6.42 years in Group 2. Approximately 58% patients in both the groups had a fracture on their right side. In Group 2, the surgery lasted significantly longer than in Group 1. Mean surgery duration was 66.68±9.70 min in Group 1 and 88.28±14.77 min in Group 2. It was longer in Group 2 because in Type A2 and A3 fractures, we had to repair the abductor mechanism using the tension band or trochanteric grip and make a larger incision for exploration. Postoperative Harris Hip Score was 85.79±8.18 in Group 1 and 76.14±10.48 in Group 2. Therefore, Harris Hip Score was significantly lower in Group 2 than in Group 1 ($p<0.001$). Postoperative Barthel Index Score was significantly higher in Group 1 (17.04±1.68) than in Group 2 (15.93±2.3) (Table 3).We performed radiological evaluation for both the groups using Kwok criteria. On the basis of Kwok criteria, we demonstrated that the result in Group 2 were significantly poorer than that in Group 1 ($p=0.039$). The results were poor-to-fair for only two patients in Group 1 and for 10 patients in Group 2.

In Group 1, 15 (26.3%) patients developed complications and in Group 2, the number of complications was 23 (32.9%). However, the difference was not statistically significant ($p=0.423$). The most common complication in both the groups was deep vein thrombosis.

There was no statistically significant difference between the lengths of preoperative and postoperative hospitalisation in the two groups ($p>0.05$).

While mean blood transfusion requirement was 1.49 (range 0–5) units in Group 1, it was 2.39 (range 0–5) units in Group 2. Thus, the amount of blood transfused inpatients in Group 2 was significantly higher than in Group 1 ($p<0.001$).

Table 1— Distribution of the Intracapsular Fracture Types (Garden classification)

Garden Type	Number of cases (n)	Percentage (%)
1	5	8.6
2	11	19.0
3	25	43.1
4	16	29.3
Total	**57**	**100.0**

Table 2— Distribution of Extracapsular Fracture Types (Orthopaedic Trauma Association Classification)

OTA Type	Number of Cases (n)	Percentage (%)
A1	13	18.3
A2	48	69.0
A3	9	12.7
Total	**70**	**100.0**

Discussion

As the average life expectancy increases worldwide, there is an increase in the incidence of hip fractures in the elderly population. The treatment methods depend on the age of pa-

Table 3— The General Data and Results for the Two Groups.

	Group 1	Group 2	p	t/z
Gender: Male/Female	17/40 (29.8/70.2)%	23/47 (32.4/67.6)%	0.714*	
Age (Years)	77.30±5.58	78.56±6.42	0.247‡	0,027
Side: Right/Left	34/24 (57.9/42.1)%	41/29 (58.6/41.4)%	0.939*	
Anaesthesia Type: General/Spinal	17/40	19/50	0.637*	
Additional Diseases: No/Yes	9/48	12/58	0.838*	
Preoperative Hospital Stay (Day)	3 (0–7)	3 (1–6)	0.348†	0.9398
Postoperative Hospital Stay (Day)	3.5 (2–17)	4 (2–10)	0.674†	0.4207
Surgery Duration (Min)	66.68 (±9.7)	88.28 (±14.77)	<0.001‡	11,935
Transfusion Requirement (Unit)	1.49 (0–5)	2.39 (0–5)	<0.01†	12281
Complication: Yes/No	15/42	23/47	0.423*	
Postoperative Barthel Index Score (0 to 20)	17.04 (±1.68)	15.93 (±2.33)	0.004‡	3,135
Postoperative Harris Hip Score (0 to 100)	85.79 (±8.28)	76.24 (±10.48)	<0.001‡	4,615
Kwok Score (Poor-To-Fair/Good-To-Excellent)	2/55	10/60	0.039§	

*Chi-Square Test: Gender, Side, Anaesthesia Type, Additional Diseases ,Complication. †Mann–Whitney U Test: Pre-, Post-operative Hospital Stays, Transfusion Requirement. ‡Student's t-test: Age, Surgery Duration, Postoperative Barthel Index Score, Postoperative Harris Hip Score. §Fisher Exact Test: Kwok Score. Group1: intracapsular hip fractures, Group 2: extracapsular hip fractures.

tients and the type of fracture. In any method, the aim is to minimize both short- and long-term mortality and recover the pre-fracture functions as soon as possible. There is no consensus on the choice of surgical treatment methods for intracapsular and extracapsular hip fracture cases. The choice of surgical procedure varies depending on the type of fracture, preferences of the orthopaedist, severity of the injury, age of the patient and accompanying disorders, such as osteoporosis or joint osteoarthritis (11).

In practice, open reduction and internal fixation are usually preferred for non-displaced fractures, whereas hemiarthroplasty or total hip replacement is preferred for displaced fractures (12). As it allows early mobilization, arthroplasty has some advantages, such as reduction of the risk of pressure ulcers, heart and lung problems and thromboembolic events and an improvement in the quality of life.

Because of the characteristics of blood flow to the affected area in intracapsular fractures, the bones frequently do not knit back together and avascular necrosis occurs. The incidence of intracapsular hip fractures in elderly patients is increasing. There is no consensus on the use of internal fixation or partial replacement as the treatment procedure (13).

Unlike in femoral neck fractures, in extracapsular fractures, the blood flow is not disrupted, and the healing potential is higher. Stabile intertrochanteric fractures are successfully treated using dynamic hip screws and proximal femoral nails (14,15). With the development of locked intramedullary systems (16), the internal fixation has recently become more commonly used in unstable fractures. However, some complications, such as high level of reduction loss, lack of knitting, external rotation and shortening, were reported following internal fixation with dynamic hip screws and first generation proximal femoral nails, particularly in unstable intertrochanteric fractures (17,18). Moreover, there is a view supporting hemiarthroplasty because it is associated with less postoperative pain and lower complication ratios than internal fixation in the treatment of intertrochanteric fractures (19,20). There are also studies reporting improved early mobilization and functionality following hemiarthroplasty (4,17,21,22). In this study, better positive effects on both early mobilization and functionality were observed for cemented bipolar hemiarthroplasty than for internal fixation in the treatment of intertrochanteric fractures.

The female-to-male ratio and mean age of patients were similar to those in the previously published studies (4,23,24). Moreover, there were no statistically significant differences among the ages, genders, sides, additional diseases and length of postoperative hospitalisation in the two groups. There was no statistically significant difference between the numbers of complications in the groups, and the most common complication in both the groups was deep vein thrombosis. Moreover, deep vein thrombosis has been reported as the most common complication in the study of Kılıçarslan et al. (4).

Surgery duration and perioperative transfusion requirements were significantly higher in the extracapsular fracture group. We believe that this difference arose because extracap-



sular fractures are more complex and require larger dissection for the repair of abductor mechanism.

The hemiarthroplasty replacement performance was evaluated using Kwok criteria. Poor-to-fair results were significantly more frequent in the treatment of intertrochanteric fractures. This was probably because of the impairment of posteromedial support in unstable intertrochanteric fractures negatively affecting the position and stability of the femoral stem. Moshein et al. revealed no correlation between the quality of prosthesis fixation and postoperative functionality results (25). However, in our study, functionality scores in the extracapsular fracture group having a higher proportion of poor-to-fair results based on Kwok criteria were worse compared with those in the intracapsular fracture group.

Barthel Index of the Activities of Daily Living and Harris Hip Score were used for the evaluation of functionality results. In the intracapsular fracture group, postoperative Barthel Index was significantly lower than in the femoral neck fracture group. Average Harris Hip Scores six months after bipolar arthroplasty were fair-to-good in both the groups and in accordance with the previously published results (4,17,23,26). However, the average Harris Hip Scores (6 months after bipolar arthroplasty) were significantly higher in the intracapsular fracture group than in the extracapsular fracture group. We believe that this difference between the functionality results in the two groups was because of the abductor mechanism injury accompanying extracapsular fracture. Additionally, we believe that the higher number of poor radiological results in extracapsular fracture group plays a role in this as well.

Moreover, we detected a correlation between postoperative Harris Hip Score and Barthel Index, independent of the fracture type (r=0,887 and p<0,001). Among patients after partial hemiarthroplasty, individuals with higher postoperative hip scores had higher postoperative activity indices.

Therefore, the bipolar hip replacement is a preferable surgical method for the treatment of intracapsular fractures. Bipolar hip replacement is also effective in extracapsular fractures because it provides a stable, painless and satisfactory joint mobility. However, as the functionality and radiological results were inferior in the extracapsular fracture group, more extensive and randomized prospective studies comparing intramedullary surgical treatment and hemiarthroplasty, particularly in unstable osteoporotic extracapsular fractures, are required.

Conflict of Interest

The authors declare no conflict of interest.

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RESEARCH

THE ATTITUDES OF MEDICAL STUDENTS TOWARD THE ELDERLY

ABSTRACT

Introduction: Health workers must be prepared for the changes and developments due to the ever-increasing proportion of elderly individuals within the general population. This study aimed to identify the general attitudes of students of the Faculty of Medicine of Celal Bayar University (CBU) toward senility and evaluate differences in the attitudes of students at different stages of medical education.

Materials and Method: This study was conducted between October and December 2014 and included a total of 406 students attending the Faculty of Medicine of the CBU. A questionnaire form composed of three sections was used to collect data.

Results: The age range of study participants was 18–27 years (average age, 21.04 years), 60.8% were females, and 91.4% had a nuclear family structure. When assessing overall UCLA scores according to the stage of medical education, the average scores of first-year students were found to be higher than other year groups. The results of the UCLA questionnaire demonstrated significantly higher overall scores concerning attitudes toward older persons in female students compared with male students. No significant differences in KOGAN questionnaire scores concerning attitudes toward older people were observed between male and female students.

Conclusion: The findings of the present study indicate that attitudes toward the elderly change negatively as students progress through medical education. In addition, female students had more positive attitudes toward elderly patients than male students. Considering the expectations from the healthcare providers of the elderly population, who are more fragile compared to normal individuals, it should be envisaged that the responsibilities of physicians have increased.

Key Words: Aged; Attitude; Student.

ARAŞTIRMA

TIP FAKÜLTESİ ÖĞRENCİLERİNİN YAŞLILARA KARŞI TUTUMLARI

ÖZ

Giriş: Sağlık çalışanları toplam nüfus içinde yaşlı popülasyon oranının giderek artmasından kaynaklanacak demografik değişikliklerin doğuracağı değişim ve gelişmelere hazırlıklı olmalıdır. Biz bu çalışmada Celal Bayar Üniversitesi Tip Fakültesi öğrencilerinin yaşlılığa karşı genel tutumlarının belirlenmesi ve tıp eğitimi sürecinde tutum konusunda sınıflar arasındaki farklılıkları tespit etmeyi amaçladık.

Gereç ve Yöntem: Bu çalışma, Ekim–Aralık 2014 tarihleri arasında Celal Bayar Üniversitesi Tip Fakültesinde okumakta olan 406 öğrenci üzerinde yürütülmüştür. Verilerin toplanmasında kullanılan anket formu üçbölümden oluşmaktadır. Birinci bölümde öğrencilerinin sosyodemografik özellikleri sorulmuş, ikinci bölümde KOGAN Yaşlılara Karşı Tutum Ölçeği Türkçe formu ve üçüncü bölümde UCLA Geriatrik Tutum Ölçeği Türkçe formu kullanılmıştır.

Bulgular: Çalışmaya katılan öğrencilerin yaşaralığı18–27 olup (ortalama yaş=21.04), %60.8'i kız, %91.4'ünün ise çekirdek aile yapısına sahip olduğu görülmüştür. Sınıflara göre UCLA toplam puanları değerlendirildiğinde 1. sınıf öğrencilerinin ortalama puanlarının diğer sınıflara göre daha yüksek olduğu saptanmıştır. UCLA'ya göre yaşlılara karşı tutumda kadınlarda erkeklere göre anlamlı pozitif tutum saptanmıştır. KOGAN da ise cinsiyet açısından yaşlılara yönelik tutumda herhangi anlamlı bir fark saptanmamıştır.

Sonuç: Çalışmada öğrencilerin yaşlılara karşı tutumlarının sınıf ilerledikçe biraz daha olumsuz yönde değiştiği söylenebilir. Ayrıca kız öğrencilerin tutumlarının da daha olumlu olduğu görülmektedir. Normal bireylere nazaran görece incinebilir yapıda olan yaşlı popülasyonun sağlık personelinden beklentileri göz önüne alındığında, hekim sorumluluğunun da artmış olacağı öngörülmek durumundadır.

Anahtar Sözcükler: Yaşlı; Tutum; Öğrenci.

Introduction

The proportion of elderly individuals in the general population is constantly increasing in Turkey and worldwide. The proportion of individuals over 65 years of age in Turkey, which was 6.7% in 2005, reached 8.0% at the end of 2014, and according to population estimates, is expected to be 20.8% in 2050 (1). The ageing society must be considered a reality that currently makes itself felt, particularly, in the economy and the health sector, rather than a future phenomenon. Due to many reasons, elderly individuals demand relatively different and more positive attitudes from healthcare workers (2).

According to the literature, there are many factors that affect the attitudes of healthcare workers toward older individuals, including age, gender, ethnicity, living with elderly individuals, and geriatric education. The opinion of younger individuals toward elderly individuals, despite differing between societies, is generally relatively distant. In addition to the ageing population of Turkey, increased longevity has led to more frequent contact between health workers and older individuals. The proportion of inpatients aged 75 years or more was 16.6% in 2008 and increased to 21.8% in 2012, in Turkey (1). However, some studies have reported generally negative attitudes of health workers toward older individuals (3, 4). In addition to health workers, the attitudes of medical students toward older individuals are also important and have been assessed by a large number of studies (5-7). Some of these studies reported that medical students have a more negative attitude toward older individuals compared with the general population, whereas there have been other studies which reported neutral or more positive attitudes (8-10). Younger medical students have been reported to have more positive attitudes toward older individuals; however, other studies have reported converse findings (9,11).

The present study aimed to determine the general attitudes of students of the Faculty of Medicine of the Celal Bayar University toward elderly and evaluate the differences in attitudes of students at different stages of medical education, in terms of preparedness for the changes and developments resulting from the increased proportion of elderly individuals within the general population. Further, this study aimed to identify and address gaps in medical education curricula regarding attitudes toward elderly individuals.

Materials and Method

A descriptive study was conducted on students of the Faculty of Medicine of the Celal Bayar University between October and December 2014, in Manisa. A total of 965 students, of which 406 were contacted using an opportunistic sampling method, were included (the number of students per year of medical education starting from first-year to internship were 71, 70, 62, 73, 58, and 72, respectively). Data were collected through structured questionnaires conducted by face-to-face interview. Questionnaire forms used to collect data were composed of three sections. The first section investigated the socio-demographical characteristics of the students, the second section was the Turkish form of the KOGAN Attitudes Toward Old People Scale, and the third section was the Turkish form of the UCLA Geriatrics Attitudes Scale. The socio-demographical questionnaire form evaluated independent variables including age, gender, city of residence until 12 years of age, educational statuses of parents, family structure, presence of sisters and brothers, and income level.

Attitude Toward Old People Scale

The KOPS/KOGAN (Kogan Attitudes Toward Old People Scale) was developed by Kogan in 1961 to measure the attitudes of individuals toward older individuals. It is a 6-point likert-type scale that does not contain medical terminology. The scale contains 34 items, 17 being positive and 17 being negative. The first 17 items belong to the negative attitude sub-scale, while items 18–34 belong to the positive attitude sub-scale. High scores obtained in the positive attitude toward older individuals sub-scale and low scores obtained in the negative attitude sub-scale demonstrate positive attitude toward older individuals. KOGAN scale scores range from 34 to 204 (12). Turkish validity and reliability of KOGAN scale was conducted in 2011 by Kılıç D and Adibelli D (13).

UCLA Geriatrics Attitudes Scale

The UCLA Geriatrics Attitudes Scale (The University of California, Los Angeles Geriatrics Attitudes Scale) was developed by Reuben *et al.*, in 1998 to assess the attitudes of health workers toward older individuals. This questionnaire, which contains positive and negative questions, is a 5-point likert-type scale. A total of four aspects are assessed comprising social values, medical care, compassion, and resources distribution. UCLA Geriatrics Attitudes Scale scores range from 14 to 70. Increasing scores in the questionnaire indicate positive attitudes of health workers toward older individuals (14). Tur-



kish validity and reliability of UCLA scale was conducted in 2011 by Sahin S and her friends (15).

Using a written statement covering the purpose and scope of the study, a written permit from the Ethics Board of the Faculty of Medicine of the Celal Bayar University and the consent of all students participating in the study were obtained. Analysis of data was performed in SPSS 15.0 program. Data were evaluated using descriptive statistics (number, percentage distribution, average, standard deviation). Differences between independent groups were assessed using Student's t-test, one-dimensional variance analysis ANOVA, posthoc Tukey test and Pearson's correlation.

Results

The age range of medical students included in the present study was 18–27 years (mean age, 21.04 years), 60.8% were females, and 91.4% had a nuclear family structure. Students whose mothers had received a 5-year education (which is the fundamental education in Turkey) comprised 74.1% of the total and students whose fathers had received a 5-year education comprised 84.7% of the total. Student income level was equal to expenditure in 68% of participants.

The mean total UCLA score of first-year students was higher than that of other year groups ($p< 0.001$, according to post-hoc Tukey test). A significant difference in the distribution of the KOGAN scores was observed between year groups, with higher overall scores observed in 2nd year students compared to 3rd year students ($p=0.013$, according to post-hoc Tukey test).

Female medical students had significantly higher UCLA questionnaire scores regarding attitude toward older individuals, compared to male students. No significant difference in the Attitudes Toward Old People Scale (KOGAN) regarding attitudes toward older individuals was observed with respect to gender.

In the present study, attitudes toward older individuals were found to be independent of students place of residence, family structure, income level, and parental educational status (Table 1).

In issues relating to the medical care sub-title of the UCLA geriatrics attitudes scale, a positive significant difference was detected in first-year medical student attitudes toward older persons ($p<0.001$, according to post-hoc Tukey test; Table 2). When assessing the correlation between the UCLA subtitles and KOGAN scores, an inverse correlation between scores from the medial and compassion sub-titles and KOGAN total scores was observed ($r=-0.21$; $p < 0.001$, $p=0.014$ respectively).

Discussion

Previous studies have reported a decrease in the positive attitude of medical faculty students toward older persons concerning health related issues as they progress through medical education. This study aimed to assess differences in general and health-related attitudes of medical students toward older persons as they progress through medical education.

In the KOGAN questionnaire measuring the attitudes of the society toward older people, the total scores of the 2nd year students were found to be higher than the total scores of 3rd year students. This finding may indicate that students in preclinic classes reflect the attitudes of society toward older people. According to the KOGAN questionnaire, a decrease in the positive attitude of students was observed from the 4th year of medical education onwards. In the medical issues subtitle of the UCLA questionnaire used to assess the attitude of medical faculty students toward older people, a significant positive attitude was found in 1st and 2nd year students. This finding corroborates the results of previous studies demonstrating a decrease in positive attitude toward older people with progression through medical education (5, 6, 16). İn the study by RB Sheikh *et al.*, in which the KOGAN questionnaire was given to 1st, 5th, and 6th year medical faculty students, a significant decrease in positive attitude toward older people was identified with progression through medical education. This result was found to be associated with limited knowledge of first year students concerning the care of elderly individuals (11). When the results of the present study are considered, the observed decrease in KOGAN scores with progressing years of the medical education may reflect the values of society toward older people and indicate that inadequate importance is given to attitudes toward older people in medical education curricula. However, in the present study, no socio-demographical features were identified that could explain the significant differences in total scores observed between medical student year groups, using the two questionnaires.

The study by RB Sheikh *et al.*, stated that female students have more negative attitudes toward older people compared to males and posited that this findings may be due to Middle Eastern and South-east Asian women being predominantly responsible for the care of the elderly individuals at home (11). However, in the present study, the attitudes of female

Table 1— Distribution of Students' Total Score of the Scale Measuring Attitudes Toward the Elderly, According to Their Socio-demographic Characteristics

Feature	n	%	Mean (sd)	p	Mean (sd)	p
Classs						
Class 1[a]	71	17.5	41.91 (2.90)	**< 0.001***	150.60 (21.23)	**0.013****
Class 2[b]	70	17.2	39.67 (3.52)		158.88 (21.68)	
Class 3[c]	62	15.3	39.80 (2.97)		145.17 (21.79)	
Class 4[d]	73	18.0	40.10 (3.37)		152.12 (22.02)	
Class 5[e]	58	14.3	40.62 (3.64)		150.74 (19.86)	
Class 6[f]	72	17.7	39.45 (3.35)		149.19 (22.18)	
Gender						
Female	247	60.8	40.64 (3.15)	**0.004**	152.60 (21.24)	**0.118**
Male	159	39.2	39.66 (3.63)		149.13 (22.48)	
Current life						
With family	177	42.1	40.23 (3.39)	**0.194**	151.84 (21.55)	**0.791**
İn dormitory	52	12.8	41.13 (2.93)		150.30 (20.39)	
With friend	127	31.3	39.92 (3.29)		150.01 (22.15)	
Alone	50	12.3	40.28 (3.86)		153.22 (23.39)	
Family structure						
Core	371	91.4	40.28 (3.39)	**0.671**	151.05 (22.04)	**0.892**
Extended	30	7.4	39.86 (3.29)		153.16 (18.58)	
Other	5	1.2	40.60 (2.70)		154.00 (23.46)	
Income level						
Income equal to expenditures	276	68.0	40.29 (3.17)	**0.931**	151.03 (21.17)	**0.906**
Income less than expenditures	51	12.6	40.09 (4.01)		152.50 (19.59)	
Income more than expenditures	79	19.5	40.25 (3.64)		151.16 (25.19)	
Mother's educational status						
Primary school or less	105	25.8	40.07 (3.17)	**0.516**	151.92 (21.92)	**0.712**
Secondary school or more	301	74.2	40.32 (3.44)		151.01 (22.10)	
Father's educational status						
Primary school or less	62	15.3	40.38 (3.29)	**0.750**	152.98 (22.80)	**0.496**
Secondary school or more	344	84.7	40.23 (3.39)		150.93 (21.61)	

*Posthoc Tukey's: a > b = c = d = e = f

**Posthoc Tukey's: b > c = a = d = e = f

students toward older people were found to be more positive than that of male students, with a very small difference in total UCLA points observed between genders. In the two previous studies conducted in Turkey, no significant difference in attitudes toward older people with respect to gender was observed (5, 14). This discrepancy between Turkish students and students of the Middle East and South-east Asia, which have cultural similarities such as living together with the elderly, is striking. Although there are previous studies that corroborate these findings, there are also studies in which no differences with respect to gender were observed (5,6,10,17,18).

When the results of the UCLA questionnaire are examined in detail with respect to gender, it was found that the significant difference in positive attitude toward older people is related particularly to questions in the sub-title covering medical issues. However, it is noteworthy that there was a decrease in the positive attitude in medical issues toward older



Table 2— Distribution of Scores Taken By Students According to the Dimensions of UCLA Geriatric Attitude Scale

Features	n	%	Mean (sd)	p	Mean (sd)	p	Mean (sd)	p	Mean (sd)	p
Class										
Class 1[a]	71	17.5	5.20±1.34	0.874	13.84±1.88	**< 0.001***	12.11±1.17	0.682	10.69±1.84	0.183
Class 2[b]	70	17.2	5.10±1.21		12.47±2.15		11.82±1.36		10.27±1.95	
Class 3[c]	62	15.3	5.12±1.09		12.01±2.27		11.91±1.45		10.74±1.76	
Class 4[d]	73	18.0	5.24±1.25		12.21±2.42		12.05±1.76		10.58±1.77	
Class 5[e]	58	14.3	5.06±1.05		12.25±2.18		12.17±1.45		11.12±1.86	
Class 6[f]	72	17.7	5.06±1.30		11.33±2.28		12.16±1.44		10.88±2.02	
Gender										
Female	247	60.8	5.14±1.15	0.926	12.65±2.18	**< 0.001**	12.07±1.43	0.545	10.76±1.87	0.418
Male	159	39.2	5.15±1.31		11.90±2.47		11.98±1.47		10.61±1.89	
Current life										
With family	177	42.1	5.11±1.23	0.929	12.46±2.42	**0.007**	12.02±1.44	0.809	10.63±1.80	0.355
İn dormitory	52	12.8	5.15±1.12		13.25±2.03		11.98±1.35		10.75±2.29	
With friend	127	31.3	5.16±1.26		12.01±2.13		12.13±1.44		10.61±1.75	
Alone	50	12.3	5.24±1.17		11.98±2.51		11.92±1.58		11.14±2.01	

*Posthoc Tukey's: a > b = c = d = e = f

people among male students as they progressed through medical education despite reporting different attitudes in subjects that did not involve health. According to the results of the KOGAN questionnaire, no significant difference with respect to gender was observed in the present study. In the study by Alford *et al*., the decrease in positive attitude of male students toward older people with progressing years was found to be associated with the fact that the males are reluctant to make detailed physical examination and take detailed anamnesis (19). In the study by Leung *et al.*, a significant difference in positive attitudes toward older people was observed in female physicians aged greater than 30 years of age who had been working for over 10 years (20). As the results of the present study were similar to these results, we believe the hypothesis that male students prefer caring for younger patients and find taking anamnesis from older people is troublesome is noteworthy and that this issue should be investigated in more detail in the future studies assessing the attitudes of students and health workers toward older people.

Previous studies have reported that living with older individuals increased positive attitude toward older people (17, 21). However, the study conducted by Cankurtaran *et al*., involving students of a medical faculty in Turkey, reported that living with older individuals was not associated with attitudes toward older people (5). In the present study, no significant difference in attitudes toward elderly individuals was observed between students who live in nuclear families and those who live in extended families. The finding that the proportion of participants who lived in a nuclear family in the present study was as high as 91.4% may have introduced bias into the results of the present study by affecting the distribution of participants. Thus, the findings of the present study should therefore be interpreted with caution.

As demonstrated by the study by Tufan *et al.*(22), in which a significant difference in the attitudes of intern students was observed before and after geriatrics rotation, geriatrics rotation training appears to be a necessary component of medical education which we believe to often be highly insufficient in Turkey and does not exist at many Turkish medical faculties.

CONCLUSION

The present study demonstrated that medical faculty students from first to sixth year (the entire duration of undergraduate medical education) had problems internalizing social and professional values regarding elderly patients. Improved medical education in this area may have a benefit in improving the relationships of medical students with older individuals/patients and establish an environment of confidence

and allowing reflection of such values and their behavior. Considering the expectations from healthcare providers of the elderly population, who are more fragile compared to normal individuals, it should be envisaged that the responsibilities of the physicians have increased. Currently, the responsibilities and liabilities of factors that prepare medical students for the medical profession, in particular lecturers and medical curricula, should be separately assessed.

Conflict of Interest

All authors accept that there is not any conflict of interest.

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Authors who have no relevant financial interests are asked to provide a statement indicating that they have no financial interests related to the material in the manuscript.

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RESEARCH

THE ATTITUDES OF MEDICAL STUDENTS TOWARD THE ELDERLY

ABSTRACT

Introduction: Health workers must be prepared for the changes and developments due to the ever-increasing proportion of elderly individuals within the general population. This study aimed to identify the general attitudes of students of the Faculty of Medicine of Celal Bayar University (CBU) toward senility and evaluate differences in the attitudes of students at different stages of medical education.

Materials and Method: This study was conducted between October and December 2014 and included a total of 406 students attending the Faculty of Medicine of the CBU. A questionnaire form composed of three sections was used to collect data.

Results: The age range of study participants was 18–27 years (average age, 21.04 years), 60.8% were females, and 91.4% had a nuclear family structure. When assessing overall UCLA scores according to the stage of medical education, the average scores of first-year students were found to be higher than other year groups. The results of the UCLA questionnaire demonstrated significantly higher overall scores concerning attitudes toward older persons in female students compared with male students. No significant differences in KOGAN questionnaire scores concerning attitudes toward older people were observed between male and female students.

Conclusion: The findings of the present study indicate that attitudes toward the elderly change negatively as students progress through medical education. In addition, female students had more positive attitudes toward elderly patients than male students. Considering the expectations from the healthcare providers of the elderly population, who are more fragile compared to normal individuals, it should be envisaged that the responsibilities of physicians have increased.

Key Words: Aged; Attitude; Student.

ARAŞTIRMA

TIP FAKÜLTESİ ÖĞRENCİLERİNİN YAŞLILARA KARŞI TUTUMLARI

ÖZ

Giriş: Sağlık çalışanları toplam nüfus içinde yaşlı popülasyon oranının giderek artmasından kaynaklanacak demografik değişikliklerin doğuracağı değişim ve gelişmelere hazırlıklı olmalıdır. Biz bu çalışmada Celal Bayar Üniversitesi Tip Fakültesi öğrencilerinin yaşlılığa karşı genel tutumlarının belirlenmesi ve tıp eğitimi sürecinde tutum konusunda sınıflar arasındaki farklılıkları tespit etmeyi amaçladık.

Gereç ve Yöntem: Bu çalışma, Ekim–Aralık 2014 tarihleri arasında Celal Bayar Üniversitesi Tip Fakültesinde okumakta olan 406 öğrenci üzerinde yürütülmüştür. Verilerin toplanmasında kullanılan anket formu üçbölümden oluşmaktadır. Birinci bölümde öğrencilerinin sosyodemografik özellikleri sorulmuş, ikinci bölümde KOGAN Yaşlılara Karşı Tutum Ölçeği Türkçe formu ve üçüncü bölümde UCLA Geriatrik Tutum Ölçeği Türkçe formu kullanılmıştır.

Bulgular: Çalışmaya katılan öğrencilerin yaşaralığı18–27 olup (ortalama yaş=21.04), %60.8'i kız, %91.4'ünün ise çekirdek aile yapısına sahip olduğu görülmüştür. Sınıflara göre UCLA toplam puanları değerlendirildiğinde 1. sınıf öğrencilerinin ortalama puanlarının diğer sınıflara göre daha yüksek olduğu saptanmıştır. UCLA'ya göre yaşlılara karşı tutumda kadınlarda erkeklere göre anlamlı pozitif tutum saptanmıştır. KOGAN da ise cinsiyet açısından yaşlılara yönelik tutumda herhangi anlamlı bir fark saptanmamıştır.

Sonuç: Çalışmada öğrencilerin yaşlılara karşı tutumlarının sınıf ilerledikçe biraz daha olumsuz yönde değiştiği söylenebilir. Ayrıca kız öğrencilerin tutumlarının da daha olumlu olduğu görülmektedir. Normal bireylere nazaran görece incinebilir yapıda olan yaşlı popülasyonun sağlık personelinden beklentileri göz önüne alındığında, hekim sorumluluğunun da artmış olacağı öngörülmek durumundadır.

Anahtar Sözcükler: Yaşlı; Tutum; Öğrenci.

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Introduction

The proportion of elderly individuals in the general population is constantly increasing in Turkey and worldwide. The proportion of individuals over 65 years of age in Turkey, which was 6.7% in 2005, reached 8.0% at the end of 2014, and according to population estimates, is expected to be 20.8% in 2050 (1). The ageing society must be considered a reality that currently makes itself felt, particularly, in the economy and the health sector, rather than a future phenomenon. Due to many reasons, elderly individuals demand relatively different and more positive attitudes from healthcare workers (2).

According to the literature, there are many factors that affect the attitudes of healthcare workers toward older individuals, including age, gender, ethnicity, living with elderly individuals, and geriatric education. The opinion of younger individuals toward elderly individuals, despite differing between societies, is generally relatively distant. In addition to the ageing population of Turkey, increased longevity has led to more frequent contact between health workers and older individuals. The proportion of inpatients aged 75 years or more was 16.6% in 2008 and increased to 21.8% in 2012, in Turkey (1). However, some studies have reported generally negative attitudes of health workers toward older individuals (3, 4). In addition to health workers, the attitudes of medical students toward older individuals are also important and have been assessed by a large number of studies (5-7). Some of these studies reported that medical students have a more negative attitude toward older individuals compared with the general population, whereas there have been other studies which reported neutral or more positive attitudes (8-10). Younger medical students have been reported to have more positive attitudes toward older individuals; however, other studies have reported converse findings (9,11).

The present study aimed to determine the general attitudes of students of the Faculty of Medicine of the Celal Bayar University toward elderly and evaluate the differences in attitudes of students at different stages of medical education, in terms of preparedness for the changes and developments resulting from the increased proportion of elderly individuals within the general population. Further, this study aimed to identify and address gaps in medical education curricula regarding attitudes toward elderly individuals.

Materials and Method

A descriptive study was conducted on students of the Faculty of Medicine of the Celal Bayar University between October and December 2014, in Manisa. A total of 965 students, of which 406 were contacted using an opportunistic sampling method, were included (the number of students per year of medical education starting from first-year to internship were 71, 70, 62, 73, 58, and 72, respectively). Data were collected through structured questionnaires conducted by face-to-face interview. Questionnaire forms used to collect data were composed of three sections. The first section investigated the socio-demographical characteristics of the students, the second section was the Turkish form of the KOGAN Attitudes Toward Old People Scale, and the third section was the Turkish form of the UCLA Geriatrics Attitudes Scale. The socio-demographical questionnaire form evaluated independent variables including age, gender, city of residence until 12 years of age, educational statuses of parents, family structure, presence of sisters and brothers, and income level.

Attitude Toward Old People Scale

The KOPS/KOGAN (Kogan Attitudes Toward Old People Scale) was developed by Kogan in 1961 to measure the attitudes of individuals toward older individuals. It is a 6-point likert-type scale that does not contain medical terminology. The scale contains 34 items, 17 being positive and 17 being negative. The first 17 items belong to the negative attitude sub-scale, while items 18–34 belong to the positive attitude sub-scale. High scores obtained in the positive attitude toward older individuals sub-scale and low scores obtained in the negative attitude sub-scale demonstrate positive attitude toward older individuals. KOGAN scale scores range from 34 to 204 (12). Turkish validity and reliability of KOGAN scale was conducted in 2011 by Kılıç D and Adibelli D (13).

UCLA Geriatrics Attitudes Scale

The UCLA Geriatrics Attitudes Scale (The University of California, Los Angeles Geriatrics Attitudes Scale) was developed by Reuben *et al.*, in 1998 to assess the attitudes of health workers toward older individuals. This questionnaire, which contains positive and negative questions, is a 5-point likert-type scale. A total of four aspects are assessed comprising social values, medical care, compassion, and resources distribution. UCLA Geriatrics Attitudes Scale scores range from 14 to 70. Increasing scores in the questionnaire indicate positive attitudes of health workers toward older individuals (14). Tur-



kish validity and reliability of UCLA scale was conducted in 2011 by Sahin S and her friends (15).

Using a written statement covering the purpose and scope of the study, a written permit from the Ethics Board of the Faculty of Medicine of the Celal Bayar University and the consent of all students participating in the study were obtained. Analysis of data was performed in SPSS 15.0 program. Data were evaluated using descriptive statistics (number, percentage distribution, average, standard deviation). Differences between independent groups were assessed using Student's t-test, one-dimensional variance analysis ANOVA, posthoc Tukey test and Pearson's correlation.

Results

The age range of medical students included in the present study was 18–27 years (mean age, 21.04 years), 60.8% were females, and 91.4% had a nuclear family structure. Students whose mothers had received a 5-year education (which is the fundamental education in Turkey) comprised 74.1% of the total and students whose fathers had received a 5-year education comprised 84.7% of the total. Student income level was equal to expenditure in 68% of participants.

The mean total UCLA score of first-year students was higher than that of other year groups ($p< 0.001$, according to post-hoc Tukey test). A significant difference in the distribution of the KOGAN scores was observed between year groups, with higher overall scores observed in 2nd year students compared to 3rd year students ($p=0.013$, according to post-hoc Tukey test).

Female medical students had significantly higher UCLA questionnaire scores regarding attitude toward older individuals, compared to male students. No significant difference in the Attitudes Toward Old People Scale (KOGAN) regarding attitudes toward older individuals was observed with respect to gender.

In the present study, attitudes toward older individuals were found to be independent of students place of residence, family structure, income level, and parental educational status (Table 1).

In issues relating to the medical care sub-title of the UCLA geriatrics attitudes scale, a positive significant difference was detected in first-year medical student attitudes toward older persons ($p<0.001$, according to post-hoc Tukey test; Table 2). When assessing the correlation between the UCLA subtitles and KOGAN scores, an inverse correlation between scores from the medial and compassion sub-titles and KOGAN total scores was observed ($r=-0.21$; $p < 0.001$, $p=0.014$ respectively).

Discussion

Previous studies have reported a decrease in the positive attitude of medical faculty students toward older persons concerning health related issues as they progress through medical education. This study aimed to assess differences in general and health-related attitudes of medical students toward older persons as they progress through medical education.

In the KOGAN questionnaire measuring the attitudes of the society toward older people, the total scores of the 2nd year students were found to be higher than the total scores of 3rd year students. This finding may indicate that students in preclinic classes reflect the attitudes of society toward older people. According to the KOGAN questionnaire, a decrease in the positive attitude of students was observed from the 4th year of medical education onwards. In the medical issues subtitle of the UCLA questionnaire used to assess the attitude of medical faculty students toward older people, a significant positive attitude was found in 1st and 2nd year students. This finding corroborates the results of previous studies demonstrating a decrease in positive attitude toward older people with progression through medical education (5, 6, 16). İn the study by RB Sheikh *et al.*, in which the KOGAN questionnaire was given to 1st, 5th, and 6th year medical faculty students, a significant decrease in positive attitude toward older people was identified with progression through medical education. This result was found to be associated with limited knowledge of first year students concerning the care of elderly individuals (11). When the results of the present study are considered, the observed decrease in KOGAN scores with progressing years of the medical education may reflect the values of society toward older people and indicate that inadequate importance is given to attitudes toward older people in medical education curricula. However, in the present study, no socio-demographical features were identified that could explain the significant differences in total scores observed between medical student year groups, using the two questionnaires.

The study by RB Sheikh *et al.*, stated that female students have more negative attitudes toward older people compared to males and posited that this findings may be due to Middle Eastern and South-east Asian women being predominantly responsible for the care of the elderly individuals at home (11). However, in the present study, the attitudes of female

Table 1— Distribution of Students' Total Score of the Scale Measuring Attitudes Toward the Elderly, According to Their Socio-demographic Characteristics

Feature	n	%	Mean (sd)	p	Mean (sd)	p
Classs						
Class 1[a]	71	17.5	41.91 (2.90)	**< 0.001***	150.60 (21.23)	**0.013****
Class 2[b]	70	17.2	39.67 (3.52)		158.88 (21.68)	
Class 3[c]	62	15.3	39.80 (2.97)		145.17 (21.79)	
Class 4[d]	73	18.0	40.10 (3.37)		152.12 (22.02)	
Class 5[e]	58	14.3	40.62 (3.64)		150.74 (19.86)	
Class 6[f]	72	17.7	39.45 (3.35)		149.19 (22.18)	
Gender						
Female	247	60.8	40.64 (3.15)	**0.004**	152.60 (21.24)	**0.118**
Male	159	39.2	39.66 (3.63)		149.13 (22.48)	
Current life						
With family	177	42.1	40.23 (3.39)	**0.194**	151.84 (21.55)	**0.791**
İn dormitory	52	12.8	41.13 (2.93)		150.30 (20.39)	
With friend	127	31.3	39.92 (3.29)		150.01 (22.15)	
Alone	50	12.3	40.28 (3.86)		153.22 (23.39)	
Family structure						
Core	371	91.4	40.28 (3.39)	**0.671**	151.05 (22.04)	**0.892**
Extended	30	7.4	39.86 (3.29)		153.16 (18.58)	
Other	5	1.2	40.60 (2.70)		154.00 (23.46)	
Income level						
Income equal to expenditures	276	68.0	40.29 (3.17)	**0.931**	151.03 (21.17)	**0.906**
Income less than expenditures	51	12.6	40.09 (4.01)		152.50 (19.59)	
Income more than expenditures	79	19.5	40.25 (3.64)		151.16 (25.19)	
Mother's educational status						
Primary school or less	105	25.8	40.07 (3.17)	**0.516**	151.92 (21.92)	**0.712**
Secondary school or more	301	74.2	40.32 (3.44)		151.01 (22.10)	
Father's educational status						
Primary school or less	62	15.3	40.38 (3.29)	**0.750**	152.98 (22.80)	**0.496**
Secondary school or more	344	84.7	40.23 (3.39)		150.93 (21.61)	

*Posthoc Tukey's: a > b = c = d = e = f

**Posthoc Tukey's: b > c = a = d = e = f

students toward older people were found to be more positive than that of male students, with a very small difference in total UCLA points observed between genders. In the two previous studies conducted in Turkey, no significant difference in attitudes toward older people with respect to gender was observed (5, 14). This discrepancy between Turkish students and students of the Middle East and South-east Asia, which have cultural similarities such as living together with the elderly, is striking. Although there are previous studies that corroborate these findings, there are also studies in which no differences with respect to gender were observed (5,6,10,17,18).

When the results of the UCLA questionnaire are examined in detail with respect to gender, it was found that the significant difference in positive attitude toward older people is related particularly to questions in the sub-title covering medical issues. However, it is noteworthy that there was a decrease in the positive attitude in medical issues toward older



Table 2— Distribution of Scores Taken By Students According to the Dimensions of UCLA Geriatric Attitude Scale

Features	n	%	Mean (sd)	p	Mean (sd)	p	Mean (sd)	p	Mean (sd)	p
Class										
Class 1[a]	71	17.5	5.20±1.34	0.874	13.84±1.88	**< 0.001***	12.11±1.17	0.682	10.69±1.84	0.183
Class 2[b]	70	17.2	5.10±1.21		12.47±2.15		11.82±1.36		10.27±1.95	
Class 3[c]	62	15.3	5.12±1.09		12.01±2.27		11.91±1.45		10.74±1.76	
Class 4[d]	73	18.0	5.24±1.25		12.21±2.42		12.05±1.76		10.58±1.77	
Class 5[e]	58	14.3	5.06±1.05		12.25±2.18		12.17±1.45		11.12±1.86	
Class 6[f]	72	17.7	5.06±1.30		11.33±2.28		12.16±1.44		10.88±2.02	
Gender										
Female	247	60.8	5.14±1.15	0.926	12.65±2.18	**< 0.001**	12.07±1.43	0.545	10.76±1.87	0.418
Male	159	39.2	5.15±1.31		11.90±2.47		11.98±1.47		10.61±1.89	
Current life										
With family	177	42.1	5.11±1.23	0.929	12.46±2.42	**0.007**	12.02±1.44	0.809	10.63±1.80	0.355
İn dormitory	52	12.8	5.15±1.12		13.25±2.03		11.98±1.35		10.75±2.29	
With friend	127	31.3	5.16±1.26		12.01±2.13		12.13±1.44		10.61±1.75	
Alone	50	12.3	5.24±1.17		11.98±2.51		11.92±1.58		11.14±2.01	

*Posthoc Tukey's: a > b = c = d = e = f

people among male students as they progressed through medical education despite reporting different attitudes in subjects that did not involve health. According to the results of the KOGAN questionnaire, no significant difference with respect to gender was observed in the present study. In the study by Alford *et al*., the decrease in positive attitude of male students toward older people with progressing years was found to be associated with the fact that the males are reluctant to make detailed physical examination and take detailed anamnesis (19). In the study by Leung *et al.*, a significant difference in positive attitudes toward older people was observed in female physicians aged greater than 30 years of age who had been working for over 10 years (20). As the results of the present study were similar to these results, we believe the hypothesis that male students prefer caring for younger patients and find taking anamnesis from older people is troublesome is noteworthy and that this issue should be investigated in more detail in the future studies assessing the attitudes of students and health workers toward older people.

Previous studies have reported that living with older individuals increased positive attitude toward older people (17, 21). However, the study conducted by Cankurtaran *et al*., involving students of a medical faculty in Turkey, reported that living with older individuals was not associated with attitudes toward older people (5). In the present study, no significant difference in attitudes toward elderly individuals was observed between students who live in nuclear families and those who live in extended families. The finding that the proportion of participants who lived in a nuclear family in the present study was as high as 91.4% may have introduced bias into the results of the present study by affecting the distribution of participants. Thus, the findings of the present study should therefore be interpreted with caution.

As demonstrated by the study by Tufan *et al.*(22), in which a significant difference in the attitudes of intern students was observed before and after geriatrics rotation, geriatrics rotation training appears to be a necessary component of medical education which we believe to often be highly insufficient in Turkey and does not exist at many Turkish medical faculties.

CONCLUSION

The present study demonstrated that medical faculty students from first to sixth year (the entire duration of undergraduate medical education) had problems internalizing social and professional values regarding elderly patients. Improved medical education in this area may have a benefit in improving the relationships of medical students with older individuals/patients and establish an environment of confidence

and allowing reflection of such values and their behavior. Considering the expectations from healthcare providers of the elderly population, who are more fragile compared to normal individuals, it should be envisaged that the responsibilities of the physicians have increased. Currently, the responsibilities and liabilities of factors that prepare medical students for the medical profession, in particular lecturers and medical curricula, should be separately assessed.

Conflict of Interest

All authors accept that there is not any conflict of interest.

Financial Disclosure

Authors who have no relevant financial interests are asked to provide a statement indicating that they have no financial interests related to the material in the manuscript.

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Case Report

NON-CONVULSIVE STATUS EPILEPTICUS FOLLOWING FOCAL MOTOR STATUS AFTER COLONOSCOPY PREPARATION IN AN ELDERLY PATIENT WITHOUT HYPONATREMIA

Abstract

Non-convulsive status epilepticus is seen in elderly patients who have not previously suffered from epilepsy. The seizures are usually provoked by an acute precipitating factor with underlying conditions such as cerebrovascular disease or brain tumours. Bowel-cleansing preparation has been used in such cases and seems to be safe but can rarely result in seizures due to hyponatremia. Focal motor status epilepticus was seen after colonoscopy preparation in our case. On the fifth day following the control of the focal motor status, non-convulsive status epilepticus was seen with unilateral periodic epileptiform discharges on electroencephalography. The patient had no prior history of epilepsy or seizures but had chronic cerebral damage. Mild hyperglycaemia and slight electrolyte abnormalities were thought to have provoked the low-threshold seizure activity.

Key Words: Non-convulsive Status Epilepticus; Bowel Preparation; Elderly; Periodic Lateralized Epileptiform Discharges; Chronic Cerebral Damage.

Olgu Sunumu

YAŞLI BİR HASTADA KOLONOSKOPİ HAZIRLIĞI SONRASINDA HİPONATREMİ OLMAKSIZIN FOKAL MOTOR STATUSU TAKİBEN GÖRÜLEN NONKONVÜLZİF STATUS EPİLEPTİKUS

Öz

Nonkonvülzif status epilepticus daha önceden epilepsisi olmayan yaşlı hastalarda görülebilmektedir. Nöbetler genellikle altta yatan serebrovasküler hastalık, tumor gibi serebral patolojisi olan hastalarda akut bir olay tarafından tetiklenmektedir. Kolonoskopi öncesi bağırsak temizliği bu yaş grubunda da güvenle uygulanmakta fakat nadiren hiponatremiye bağlı nöbetler görülebilmektedir. Hastamızda kolonoskopi hazırlığı sonrasında fokal motor status görülmüş, bu durum kontrol altına alındıktan 5 gün sonra ise elektroensefalografide tek taraflı periyodik lateralize epileptiform deşarjlarla karakterize nonkonvülzif status tablosu ortaya çıkmıştır. Hastada epilepsi veya nöbet öyküsü olmamakla birlikte kronik serebral hasar saptanmıştır. Muhtemelen ılımlı hiperglisemi ve elektrolit düzeylerindeki hafif anormallikler nöbet eşiği düşük olan bu hastada nöbet aktivitesini provoke etmiştir.

Anahtar Sözcükler: Nonkonvülzif Status Epilepticus; Kolonoskopi Hazırlığı; Yaşlı; Periyodik Lateralize Epileptiform Deşarj; Kronik Serebral Hasar.

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Introduction

Non-convulsive status epilepticus (NCSE) is defined as a condition of intermittent or ongoing seizure activity seen on electroencephalography (EEG) without any convulsions for at least 5 min. There are two main types of NCSE: 1) confusion or abnormality in behaviour and 2) continued unconsciousness after a prolonged generalized tonic–clonic seizure with or without subtle motor manifestations (1,2). Seventy percent of elderly patients with NCSE are reported to have not previously suffered from epilepsy (3). Postictal confusion can last from hours to days with this population; therefore, prolonged episodes of confusion should prompt an evaluation for NCSE (4).

The aetiology of NCSE includes cerebrovascular disease, neurodegenerative diseases, brain tumours, trauma, metabolic disturbances and infections (4,5). There are few case reports regarding elderly patients who had seizures due to electrolyte abnormalities, especially hyponatremia, after bowel preparation (6,7,8). The substances used for colon cleansing are known to cause electrolyte abnormalities (6,9). One of these substances is oral sodium phosphate, which is generally well tolerated by patients and has been found to be very effective (9).

EEG and brain magnetic resonance imaging (MRI) are the most important specific investigations for NCSE (4). EEG manifestations include continuous or virtually continuous spike-wave discharge, discrete focal electrographic seizures, diffuse slow activity with or without spikes and periodic or repetitive epileptiform discharges (10).

Our case describes an elderly patient with no history of epilepsy who presented with NCSE with unilateral EEG changes and focal motor status following colonoscopy preparation.

Case

An 84 year old female was hospitalized for delirium triggered by infection. On admission, brain MRI showed encephalomalacia due to left posterior cerebral artery infarction, nonspecific subcortical white matter hyperdensity due to ischemic, gliotic changes in the left frontoparietal region and occlusion of the left internal carotid artery. On neurological examination, she was found to be disoriented and had difficulty with complex commands. Past medical history included diabetes mellitus, coronary artery disease, chronic obstructive pulmonary disease, hypertension and peripheral artery disease. Medication history included ciprofloxacin, 1000 mg/d. After the delirium symptoms were taken under control, colonoscopy was planned for the investigation of anaemia. The patient was given oral sodium phosphate and parenteral fluids to prevent dehydration and electrolyte imbalance. After the preparation prior to colonoscopy, clonic seizures of her right lower extremity were observed, which subsequently spread to the upper extremity and face. These were controlled with diazepam (5 mg). The patient had two more seizures and was diagnosed with focal motor status epilepticus. Considering of her age and co-morbidities, 15 mg/kg levetiracetam (LEV) infusion was started and an EEG was performed. As seizures of the right hemibody continued, rhythmic delta frequency activity was recorded on the left hemisphere. Seizure activity was controlled by the end of the LEV infusion. After the seizure, she became aphasic and hemiplegic on the right side. At the start of the seizure, her vital signs were as follows: blood pressure, 110/70 mmHg; pulse, 100/min and temperature, 36.7°C. Her laboratory results before the seizure were as follows: glucose, 200 mg/dL; sodium, 134 mEq/L; potassium, 3.34 mEq/L; calcium, 9.42 mg/dL; magnesium, 1.49 mg/dL and phosphorus, 3.92 mg/dL. We continued with 500 mg/d LEV that was increased to 1000 mg/d in 3 days. On the fifth day, the patient lost consciousness. Her eyes were deviated to the right, and an increase in right hemiparesis was observed. She was determined to be in NCSE, and diazepam (10 mg) was administered. As a result, an improvement in the neurological status was observed. EEG showed periodic lateralized epileptiform discharges (PLEDs) in the left hemisphere and central areas (Figure 1). Her vital signs at this time were as follows: blood pressure, 190/80 mmHg; pulse, 110/min and temperature, 36°C. Laboratory values were as follows: glucose, 254 mg/dL; sodium, 136 mEq/L; potassium, 3.82 mEq/L; calcium, 9.5 mg/dL; magnesium, 1.59 mg/dL and phosphorus, 3.26 mg/dL. The patient was still unconscious during the EEG recording, and hence, 500 mg LEV was given as an intravenous infusion in addition to her routine treatment. When the patient was unresponsive to the LEV infusion, she was considered as refractory status epilepticus and admitted to the intensive care unit. She was intubated and ventilated, along with the initiation of a midazolam infusion (0.3 mg/kg/h). The sedation was gradually terminated when a suppression pattern was observed on EEG. Phenytoin was added with a 750-mg loading dose and a dose of 200 mg/day thereafter, which was subsequently increased to 300 mg/d after considering blood concentration levels. On the following

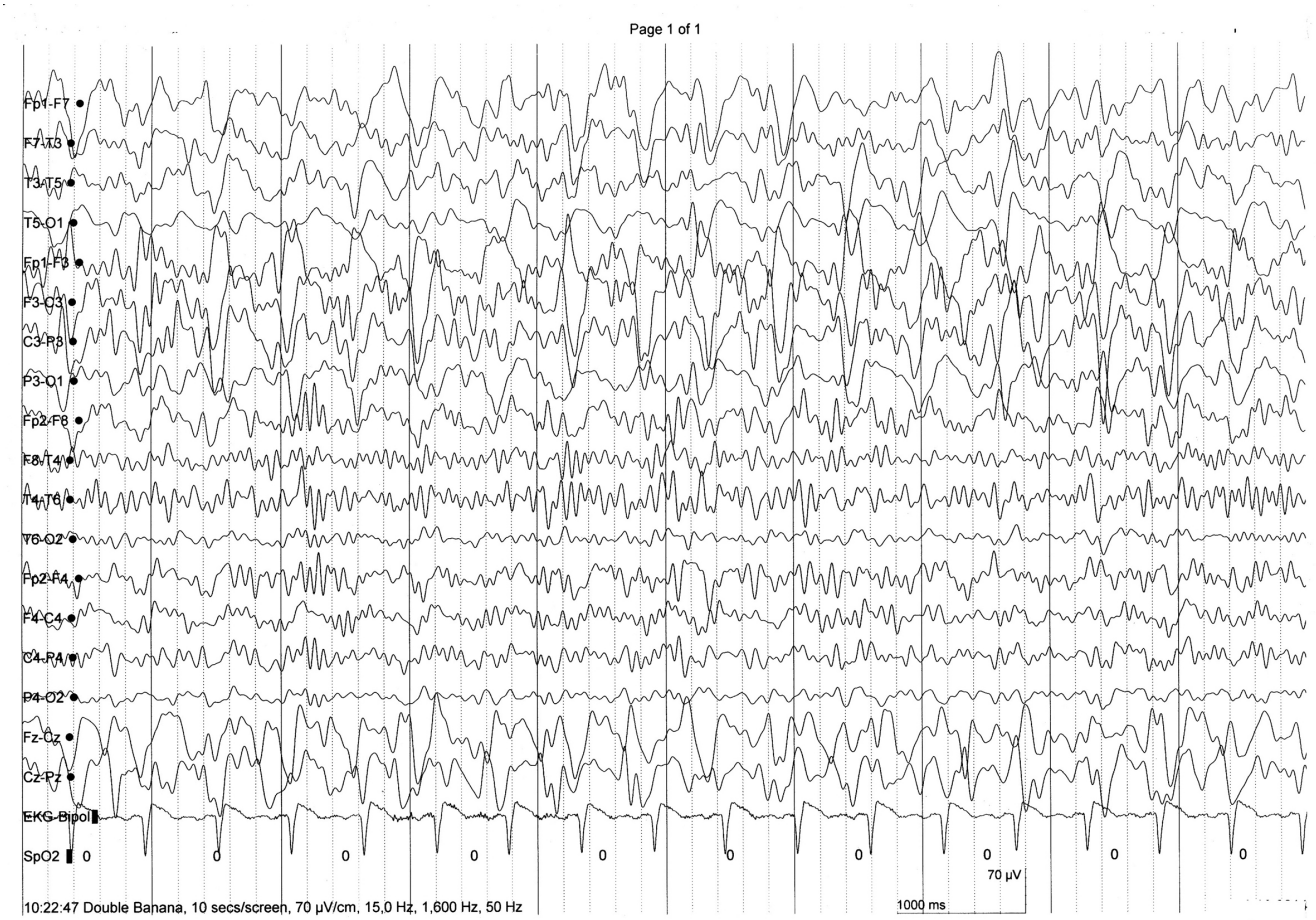


Figure 1— Periodic lateralized epileptiform discharges seen in the left hemisphere and the central areas with a slow background activity.

EEGs, PLEDs in the left hemisphere were observed for approximately 5 more days, which then gradually disappeared (Figure 2). The patient continues to be seizure free while maintained on 200 mg/d phenytoin.

Discussion

Several studies have shown that the incidence of acute provoked and unprovoked seizures as well as status epilepticus is higher in the elderly (4), and 12%–30% of adults with newly diagnosed epilepsy present with status epilepticus (11). Mortality progressively increases with age, aetiology and duration of status and increases to almost 50% in those older than 80 years (2,3,4). Cerebrovascular disease appears to be the most common aetiology (4,12). In a study conducted in Turkey, the etiologic factor was determined to be a structural pathology in 44.7% cases, metabolic disorder in 13.2% and systemic infection in 18.4% (5).

Oral sodium phosphate is the most frequently used substance for colonoscopy preparation and is regarded as safe for use in patients older than 80 years. With the frequent use of this substance for bowel preparation, electrolyte shifts are typically minor, transient and clinically insignificant (9). In our case there was only slight electrolyte imbalance. We believe that due to the underlying cerebral pathology, colonoscopy preparation triggered focal motor seizures. Despite the mild hyperglycaemia (254 mg/dl), the HbA1c value was under 6.5, indicating that the diabetes was controlled. Due to



Figure 2— Periodic lateralized epileptiform discharges seen in the left hemisphere and the central areas during the administration of the midazolam infusion.

the lowered seizure threshold, hyperglycaemia likely provoked NCSE on the fifth day, without any obvious electrolyte abnormalities. Furthermore, the patient was taking ciprofloxacin, which is known to lower the seizure threshold.

Approximately 44%–66% of focal findings in NCSE are reported on EEG (5,13). PLEDs are the consequence of acute cerebral damage, which may or may not be associated with seizures (14). Periodic discharges should direct attention to the high potential for seizures and status epilepticus (15). After the clinical seizure has ceased, periodic hemispheric afterdischarges can be seen, which eventually burn out with time, as seen in our case (15, 16).

The standard treatment for status epilepticus is diazepam, phenytoin, or valproate. In refractory cases, heavy sedation is recommended (2,17). Due to its circulatory side effects, phenytoin is unsuitable for frail, elderly, or cardiac-compromised patients (18). Recently LEV is recommending as an antiepileptic drug with an excellent safety profile and broad spectrum efficacy in cases where phenytoin is not appropriate, as in our patient (2,17,18).

Because the elderly, especially those with a brain lesion, are far more susceptible to any biochemical changes or dehydration causing them to have a lower seizure threshold, any sort of interventional procedures should be undertaken with great care. There is also the possibility of the elderly patient's condition deteriorating even after recovery; therefore, continuing the attentive care for a longer duration during the postictal period is highly recommended.

Conflicts of Interest

None of the authors has any conflict of interest to disclose.

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Case Report

UNUSUAL CLINICAL VARIANT OF CUTANEOUS LEISHMANIASIS: ERYSIPELOID LEISHMANIASIS

Abstract

Although cutaneous leishmaniasis was an important health problem in the Southeast Anatolia region of Turkey before the 1950s, it was effectively controlled by successful health policies thereafter. Classical clinical presantation of cutaneous leishmainasis is the painless erytemaotus papules or nodules developed in the areas of infected sandfly bite which are ulcerated and healed gradually with a scar formation. cutaneous leishmaniasis can be presented in its atypical forms as well, such as zosteriform, sporotrichoid, psoriasiform, chancriform, paronychial cutaneous leishmaniasis. In this case report, we present a 67 years old women with erysipeloid cutaneous leishmaniasis, a rare atypical form of cutaneous leishmaniasis, who was succesfully treated. Cutaneous leishmaniasis is an increasing health problem in Middle Eastarn countries and countries receiving refugees nowadays. Regional and international health organizations should be aware of this problem and support the fight against this disease accordingly.

Key Words: Aged; Cutaneous leishmaniasis; Erysipeloid leishmaniasis.

Olgu Sunumu

KUTANÖZ LEİSHMANİASİSİN NADİR VARYANTI: ERİZİPELOİD LEİSHMANİASİS

Öz

Türkiye'nin Güneydoğu Anadolu bölgesinde 1950 yılları öncesinde endemik olarak görülen kutanöz leishmanisis başarılı sağlık politikaları sayesinde bu tarihten sonra etkin olarak kontrol altına alınabilmiştir. Kutanöz leishmaniasis klasik olarak tatarcık sineğinin soktuğu alanda gelişen ağrısız papül ve nodüler lezyonların ülsere olup daha sonrasında skar dokusu bırakarak iyileşmesi ile karakterizedir. Kutanöz leishmaniasis zosteriform, sporotrikoid, psöriaziform, şankriform, paronişyal gibi atipik klinik tablolarla da karşımıza çıkabilmektedir. Bu olgu sunumunda atipik kutanöz leishmanisisin nadir görülen alt tiplerinden olan erizipeloid leishmaniasis tanısı alarak başarılı şekilde tedavisi tamamlanan 67 yaşında kadın hasta sunulmaktadır. Kutanöz leishmanisis orta doğu ülkeleri ve göç alan komşu ülkelerde önemli bir sağlık problemi olarak son yıllarda karşımıza çıkmaktadır. Bölgesel ve uluslararası sağlık örgütlerinin, artan bu sağlık probleminden haberdar olup hastalıkla mücadelede desteklerini artırmaları gerekmektedir.

Anahtar Sözcükler: Yaşlı; Kutanöz leishmaniasis; Erizipeloid leishmaniasis.

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Introduction

Cutaneous leishmaniasis (CL) is a protozoal infection caused by intracellularly located Leishmaniaspecies that are transmitted through Phlebotomus genus vectors (1). Although CL was an important health problem in the Southeast Anatolia region of Turkey before the 1950s, it was effectively controlled by successful health policies thereafter (1). However, due to the recent increase in the Middle Eastern refugee population in Turkey, CL cases have remarkably increased and a great variability of atypical forms of the disease have also begun to frequently appear, which may cause some difficulties in diagnosis and treatment. Here we describethe case of a 67-year-old woman with erysipeloidCL, a rare atypical form of CL, who was successfully treated.

Case Report

A 67-year-old female was admitted to our clinic with enlarging areas of redness on her face. The patient's history revealed the development of a painless papule 0.5–1 cm in diameter on the nose 2 years previously,which began to extend to her cheeks and forehead. On clinical examination, erysipelas-like erythematous, edematous plaques with superficial ulcerations and crusts were observed on the midline of the face, including the dorsum of the nose, cheeks, lower forehead, and the philtrum (Figure 1). She was otherwise healthy. Laboratory examinations, including the complete blood count, blood and urine biochemistry, and chest radiographyshowed normal results. Microscopical examination of Giemsa-stained smears prepared from the lesion revealed intracellular and extracellular amastigote forms of the Leishmania protozoa, confirming the diagnosis of cutaneous leishmaniasis (CL). Since it was a clinically atypical erysipeloid CL and the lesion was located on the face, meglumineantimoniate15 mg/kg/day was administered intramuscularly, and the treatment was continued for 15 days without any side effects. At the end of the treatment, she recovered completely (Figure 2).



Figure 1— Before treatment.



Figure 2— After treatment.

Discussion

The classical clinical presentation of CL is characterized by the development of painless erythematous papules or nodules in the areas of infected sandfly bites that have ulcerated and healed gradually with the formation of a scar. However, CL can also presentin its atypical forms, such as zosteriform, sporotrichoid, psoriasiform, chancriform, paronychial, and erysipeloid CL (2-4). Erysipeloid CL is a rare type of CL that was first reported in Iran in 1994 (5). The frequency of erysipeliod CL and other atypical forms of CL are not exactly known due to a lack of reports related to this subject. However, the studies that have analyzed the frequencies of atypical CL and erysipeloid CL are shown in Table 1.

The causes for the formation of atypical erysipeloid CL instead of classical CL are not known, although the patient's immune status may be responsible. Erysipeloid and other atypical forms of CL may appear in patients with defective im-

Table 1— Frequencies of Atypical CL and Erysipeloid CL

Studies	Total Number of the Patiens	Frequency and (Number) of Atypical CL	Frequency and (Number) of Erysipeloid CL
Gurel et al. (6)	2120	1.9%	–
Bari et al. (3)	718	5.7% (41)	–
Momeni et al. (5)	1250	–	1.36% (17)
Bongiorno et al. (4)	50	40.0% (20)	34.0% (17)
Raja et al. (7)	1709	2.1% (37)	0.05% (1)

mune systems, such as a previous patient of ours who has diabetes mellitus (8). Secondly, erysipeloid CL has been reported to commonly appear in middle aged and elderly females like our patient (5). This may indicate a possible role of some hormonal factors in the development of this subgroup (9). Thirdly, as was seen in our patient, mid-face involvement seems to be common in erysipeloid CL (9,10). Increased fragility of the skin in this area may facilitate the spread of the parasite in this location (5). Fınally, erysipeloid CL may be associated with a new leishmania species (3).

Based on this case, we want to indicate two important points: first, the diagnosis of atypical CLs including erysipeloid CL can be difficult and this may cause a delay in treatment. To prevent late diagnosis, we recommend giving special attention to patients with atypical lesions,traveling from endemic regions. Additionally, in patients with chronic lesions, lesions ≥5 cm, lesions on the face, fingersor toes, or in cases of immunosuppression, we emphasize the necessity of systemic treatment.

Cutaneous leishmaniasis is an increasing health problem in Middle Eastern countries and countries currently receiving refugees. Regional and international health organizations should be aware of this problem and support the fight against this disease accordingly.

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