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Türk Geriatri Dergisi / Turkish Journal of Geriatrics 17/3 2014



17/3 2014

www.geriatri.org

ISSN: 1304-2947
e-ISSN: 1307-9948

Turkish Journal of Geriatrics

Türk Geriatri Dergisi

The Official Scientific Journal of Turkish Geriatrics Society
Türk Geriatri Derneği'nin Bilimsel Yayın Organıdır

www.geriatri.org

ISSN: 1304-2947 • e-ISSN: 1307-9948

Türk Geriatri Derneği IAGG üyesidir

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TÜRK GERİATRİ DERNEĞİ'nin bilimsel yayın organı ve yerel süreli yayındır.
(*The official scientific journal of Turkish Geriatrics Society)*

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Ostim/ANKARA
Telefon: (0312) 394 55 90 - 91 - 92
Faks: (0312) 394 55 94

"Turkish Journal of Geriatrics"; Science Citation Index Expanded (Sci Search), Journal Citation Reports/Science Edition, Social Sci Search, Journal Citation Reports/Social Sciences Edition, Index Copernicus Master List, EMBASE, SCOPUS, ELSEVIER, EBSCO, TÜBİTAK - ULAKBİM "TÜRK TIP DİZİNİ", Türk Medline ve Türkiye Atıf Dizini kapsamında yer almaktadır.

"Turkish Journal of Geriatrics" is indexed in: Science Citation Index Expanded (Sci Search), Journal Citation Reports/Science Edition, Social Sci Search, Journal Citation Reports/Social Sciences Edition, Index Copernicus Master List, EMBASE, SCOPUS, ELSEVIER, EBSCO and "Turkish Medical Index" of Turkish Academic Network and Information Center in The Scientific and Technological Research Council of Turkey (TÜBİTAK-ULAKBİM), Turk Medline and Turkey Citation Index.

Yılda dört kez (Mart, Haziran, Eylül, Aralık) yayınlanır.
[Published four times (March, June, September, December) a year]

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M. Rauf İnan Sok. No. 3 06410
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TÜRK GERİATRİ DERNEĞİ
Turkish Geriatrics Society
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Basım Tarihi: 1 Ekim 2014

Turkish Journal of Geriatrics
Türk Geriatri Dergisi

2014
17/3

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Baş Editörden
(From The Editor In Chief)

Education programs of Turkish Geriatrics Society are going to take place continuously.

Regarding the requests of the attendees of the 1st course, "**2 nd Course on Scientific Researches in Geriatrics**" will be organized in winter, 2014 and national trainers who are experienced on research methodology and scientific writing in geriatrics and gerontology will take part during this interactive course.

"**Basic Geriatrics Updating Course**" for medical doctors and "**Geriatric Nursing Updating Course**" for nurses are planned to be held in April, 2015.

The detailed programs will be announced on the web site of the society.

The society is going to organize a public conference on "**Dementia, Delirium and Depression**" on the 1st of October "**International Elderly Day**" in Çankaya Municipality-**100+ Age Club,** Ankara-Turkey as well. The members of the 100+ age club will be informed about prevention, early diagnosis and tretament of these three neurological and psychological diseases that are seen in advanced age. Assoc. Prof. Ufuk Ergün will be the presenter.

The board of directors of Turkish Geriatric Society cordially thank the organizers and speakers of these education activities.

Prof. Yesim GOKCE KUTSAL, M.D

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Turkish Journal of Geriatrics
2014; 17 (3) 223-227

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RESEARCH

THE MEASUREMENT OF EXHALED CARBON MONOXIDE AND ARTERIAL CARBOXYHEMOGLOBIN CONCENTRATIONS IN MIDDLE-AGED AND ELDERLY PATIENTS WITH COPD

ABSTRACT

Introduction: Arterial blood carboxyhemoglobin concentrations and exhaled carbon monoxide concentrations have been suggested to be inflammatory markers. Arterial carboxyhemoglobin concentrations can be measured from blood gas samples and concentrations of carboxyhemoglobin can be measured from carbon monoxide in exhaled air.

We studied the relationship between arterial carboxyhemoglobin and exhaled carbon monoxide concentrations and disease severity. We evaluated whether arterial carboxyhemoglobin is useful for monitoring disease activity in patients with chronic obstructive pulmonary disease.

Materials and Methods: Fifty-seven middle aged or elderly patients who were admitted to the outpatient clinic were included in the study. Patients were stable for chronic obstructive pulmonary disease and all participants were ex-smokers. The carboxyhemoglobin concentrations were measured and arterial and venous carboxyhemoglobin concentration differences were calculated. Exhaled carbon monoxide concentrations in both control subjects and patients were measured.

Results: There were 13 controls and 44 patients with chronic obstructive pulmonary disease. There were no significant differences in age and smoking history (pack/year) between groups.

The arterial blood carboxyhemoglobin concentrations in patients with chronic obstructive pulmonary disease were higher than those in control subjects ($p<0.001$). There was a significant correlation between carboxyhemoglobin concentrations in arterial blood and exhaled carbon monoxide concentrations ($p<0.001$; r:0.71). Arterial carboxyhemoglobin was inversely correlated with force expiratory volume in one second ($p<0.001$; r:-0.74). Venous blood carboxyhemoglobin concentrations were higher in the chronic obstructive pulmonary disease group than in the controls ($p<0.05$). exhaled carbon monoxide levels of patients were significantly higher than controls ($p<0.001$).

Conclusion: Arterial carboxyhemoglobin is useful for monitoring disease activity in patients with chronic obstructive pulmonary disease.

Key Words: Aged; Middle Aged; Carboxyhemoglobin/Metabolism; Pulmonary Disease, Chronic Obstructive/Blood; Respiratory Function Tests.

ARAŞTIRMA

ORTA VE İLERİ YAŞLI KRONİK OBSTRUKTİF AKCİĞER HASTALARINDA EKSHALE KARBONMONOKSİD VE ARTERYEL KARBOKSİHEMOGLOBİN ÖLÇÜMÜ

ÖZ

Giriş: Arteryel kandaki karboksihemoglobin ve ekshale edilen havada ki karbonmonoksid düzeylerinin inflamatuar marker olabileceği ileri sürülmektedir. Arteryel karboksihemoglobin konsantrasyonu arter kan gazı analizleriyle ölçülür ve ekshale karbonmonoksid ölçümünden de arteryel karboksihemoglobin konsantrasyonu düzeyi tahmin edilebilir.

Bu çalışmada hastalığın şiddeti ve arteryel karboksihemoglobin ile ekshale karbonmonoksid arasında ki ilişki araştırıldı. Kronik obstruktif akciğer hastalığının aktivitesinin monitorizasyonun da arteryel karboksihemoglobinin yararlı olup olmadığı da değerlendirildi.

Gereç ve Yöntem: Polikliniğe başvuran orta ve ileri yaşlı toplam 57 hasta ve kontrol grubu çalışmaya dahil edildi. Stabil dönemdeki kronik obstruktif akciğer hastaları ve kontrol grubu exsmoker idi. Karboksihemoglobin düzeyi hem arter kanında hem de venöz kanda ölçüldü ve arteriovenöz karboksihemoglobin konsantrasyon farkı hesaplandı. Ekshale karbonmonoksid konsantrasyonu hasta ve kontrol grubunda ölçüldü. İstatistiksel analiz SPSS 17.0 kullanılarak yapıldı.

Bulgular: Kırk dört kronik obstruktif akciğer hastası ve 13 kontrol grubu çalışmaya katıldı. Gruplar arasında yaş ve sigara içme süresi (paket/yıl) açısından fark saptanmadı.

Arteryel karboksihemoglobin konsantrasyonu kronik obstruktif akciğer hastalarında kontrol grubundan anlamlı olarak yüksekti ($p<0.001$). Arteryel karboksihemoglobin konsantrasyonu ile ekshale karbonmonoksid arasında korelasyon mevcuttu ($p<0.001$; r:0.71). Arteryel karboksihemoglobin birinci saniyedeki zorlu ekspirasyon volümünün yüzde prediktif değeri ile ters ilişki idi ($p<0.001$; r:0.71). Venöz karboksihemoglobin konsantrasyonu kronik obstruktif akciğer hastalarında kontrol grubundan yüksekti ($p<0.05$). Ekshale karbonmonoksid düzeyi hastalarda kontrol grubundan anlamlı derecede yüksekti ($p<0.001$).

Sonuç: Arteryel karboksihemoglobin kronik obstruktif akciğer hastalığının aktivasyonun monitorizasyonunda faydalıdır.

Anahtar Sözcükler: Yaşlı; Orta Yaşlı; Kronik Obstruktiktif Akciğer Hastalığı; Arteryel Karboksihemoglobin düzeyi; Solunum Fonksiyon Testi.

Introduction

Chronic obstructive pulmonary disease (COPD) is a global health problem and is characterized by airflow obstruction and inflammation of airways. Many factors are associated with the pathogenesis of COPD, including oxidative stress, inflammatory cells, and some mediators (1).

Exhaled carbon monoxide (CO) and arterial blood carboxyhemoglobin concentrations (Hb-CO) increase in inflammatory pulmonary diseases (2). In patients with COPD, airflow limitation calculated by force expiratory volume in one second (FEV1) inversely correlates with several inflammatory indicators, such as nitric oxide (NO) levels in exhaled air (3, 4), 4-hydroxy-2-nonenal levels in the lung (5), and sputum interleukin-8 levels (6).These have been suggested as markers for monitoring the production of reactive oxygen species in the lung, and inflammation in the airway and lung in patients with COPD (3, 5).

Heme oxygenase (HO) is expressed in airway epithelial cells (7), endothelial cells (8), and alveolar macrophages (9). Carbon monoxide (CO) is produced endogenously by HO, and is known to be present in measurable quantities in the exhaled air of normal subjects (10, 11). Stimulation of HO by oxidant stress and proinflammatory cytokines (12) in airways, and lung inflammation, are suggested to cause the increased levels of exhaled CO in patients with inflammatory pulmonary diseases (9, 11, 13).

Arterial blood carboxyhemoglobin (Hb-CO) concentrations are correlated with exhaled CO concentrations (10), and have been proposed to be an inflammatory marker in inflammatory pulmonary disease, including bronchial asthma, acute pneumonia, and silicosis (14).

Arterial Hb-CO concentrations can be measured via the measurement of blood gas. The concentration of carboxyhemoglobin (Hb-CO) is often estimated from measurements of carbon monoxide in exhaled air.

In this study, we studied the relationship between Hb-CO concentrations and disease severity and we investigated whether the presence of airflow obstruction significantly alters the relationship between exhaled CO and Hb-CO. We evaluated whether arterial Hb-CO is useful to monitor disease activity in patients with chronic obstructive pulmonary disease (COPD).

Materials and Methods

This study was conducted in the Chest Medicine and Tuberculosis Clinic in a large training and research hospital. The protocol was approved by the local ethics committee and all participants signed informed consents before their enrollment.

Patients and Controls

Fifty-seven middle aged or elderly consecutive patients who were admitted to the outpatient clinic were enrolled in the study.

We studied 13 control subjects and 44 patients with COPD. Patients with COPD were classified according to the criteria of the Global Initiative for Chronic Obstructive Lung Disease (GOLD) (1). Seven patients were classified into GOLD II (moderate), 19 into GOLD III (severe), and 18 patients into GOLD IV (very severe) COPD.

Patients were stable for COPD (had not had exacerbation at least for 4 weeks: white blood count (WBC), neutrophils, sedimentation, C-reactive protein (CRP) of patients were normal and there were not any symptom of exacerbation like worsening of patient's respiratory symptoms) and all participants (including controls) had been ex-smokers for at least 3 months (Patients and controls declared that they were exsmokers at least 3 months). Passive smokers, both patients with COPD and control subjects were excluded. None of the COPD patients had received oral or inhaled corticosteroids for 3 months.

Measurement of Arterial and Venous Blood Hb-CO and Exhaled CO

We drew blood from the radial artery and the median cubital vein in patients with COPD and in control subjects. We measured the Hb-CO concentrations with a spectrophotometer, and calculated the arterial and venous (a-v) Hb-CO concentration differences. We also measured exhaled CO concentrations in the control subjects and patients with electrochemical sensor (EC50; 50 Bedfront). To avoid the influence of ambient CO on Hb-CO, Hb-CO and exhaled CO levels were measured at least 5 hours after arrival in a room in the hospital with low ambient CO. Spirometry was evaluated for each participant. The size of the measurement error (ΔCO) was calculated from the difference between Hb-CO and exhaled CO. Each measurement for both patients and controls was made on the same day for each person.

Statistical Analysis

SPSS 17.0 (Chicago IL, USA) was used for statistical analysis. The age, Hb-CO concentrations, (a-v) Hb-CO difference, ex-

Table 1— The Characteristics and Results of Patients With COPD and Control Subjects

	Patients n:44	Controls n:13	P
Age (yr)	64.3±8.1	62.7±5.9	p>0.05
Smoking History(pack/year)	56.8±25.1	53.3±18.2	p>0.05
FEV1(% pred)	40.7±10.6	100.2±18.7	p<0.001
FVC (%pred)	53.1±10.2	95.6±16.6	p<0.001
FEV1/FVC (%)	58.2±8.9	82.9±7.7	p<0.001
Venous Hemoglobine(mg/dl)	14.8±1.3	14.3±0.7	p>0.05
Exhaled CO (ppm)	5.3±1.4	1.3±0.8	p<0.001
%CO	1.4±0.2	0.7±0.2	p<0.001
PaCO2 (mmHg)	40.8±6.2	36.3±1.8	p<0.05
PaO2 (mmHg)	64.6±10.9	76.5±6.1	p<0.001
SaO2 (%)	91.4±4.3	95.1±1.0	p<0.05
Hb-CO (%) arterial	3.2±0.5	1.6±0.5	p<0.001
Hb-CO (%) venous	2.3±1.0	1.7±0.8	p<0.05
ΔCO	1.76±0.6	0.80±0.49	p<0.001
(A-V)Hb-CO (%)	0.82±0.97	-0.12 ±0.83	p<0.05

Values are mean ± sd. FEV1: Forced expiratory volume one second, FVC: Forced vital capacity, Exhaled CO: Exhaled carbondioxide, Hb-CO: Carboxyhemoglobin, ΔCO: Measurement Error.

haled CO concentrations, arterial partial pressure of O_2 (PaO_2) and CO_2 ($PaCO_2$) values, ΔCO, FEV_1, FVC and FEV_1/FVC in each group were reported as mean ± SD. Statistical analysis of these values was performed using nonparametric tests. The Mann Whitney U test was used for comparing groups. Correlation analysis was done with Pearson correlation tests. Significance was accepted as p<0.05.

Results

The characteristics of patients with COPD and control subjects are shown in Table 1. The mean age of patients was 64.3±8.1 years (45-80) and that of controls was 62.7±5.9 years (54-70). There was no statistically significant difference in age and smoking history (pack/year) between normal control subjects and patients. All control subjects and patients were ex-smokers.

The arterial blood Hb-CO concentrations in patients with COPD (3.20%±0.55) were significantly higher than those in control subjects (1.60%±0.57; p<0.001). Among the patients with COPD, Hb-CO concentrations in patients at GOLD 4 (3.59%±0.47; n=18) and GOLD 3 (3.05%±0.38; n=19) were higher than in patients at GOLD 2 (2.57%±0.39; n =7) (Figure 1).

There was a significant correlation between arterial Hb-CO and exhaled CO (p<0.0001; r=0.71). Arterial Hb-CO was inversely correlated with FEV1% (p<0.0001; r=-0.74) (Figure 2).

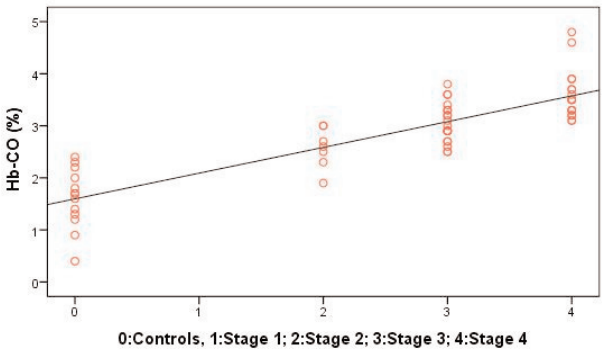


Figure 1— Hb-CO concentrations of patients and controls.

Venous blood Hb-CO concentrations were higher in the COPD group (2.38±1.0) than in controls (0.12±0.83; p<0.05). There were no differences among COPD stages. The difference between arterial and venous Hb-CO was higher in the patient group (0.85%±0.9) than in controls (0.12%±0.8; p<0.05).

Exhaled CO levels of patients (5.32±1.49; n=44) were significantly higher than those of controls (1.31±0.85; n=13; p<0.001). There were no significant differences among COPD stages for exhaled CO levels.

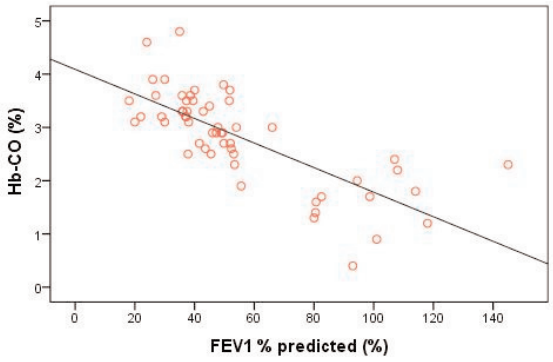


Figure 2— Correlation between FEV1 and Arterial Hb-CO in COPD patients (p<0.001, r=-0.74).

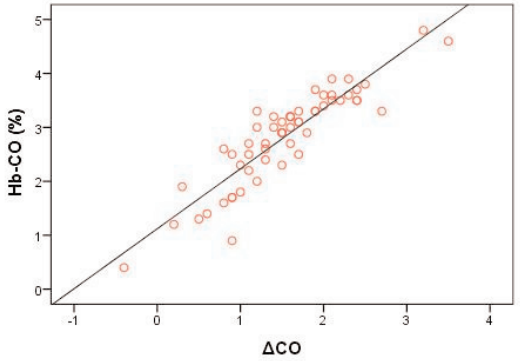


Figure 3— Correlation between Arterial Hb –CO and ¢CO (p<0.001, r=0.90).

ΔCO was significantly different between patients and controls (Table 1). GOLD 4 COPD patients' ΔCO levels were significantly higher than those for GOLD 2 COPD patients. There were no significant differences among the other groups. ΔCO was inversely correlated with FEV1% (p<0.001; r=-0.54) (Figure 3).

Discussion

The present study demonstrated that arterial Hb-CO and exhaled CO concentrations in patients with COPD were higher than those in control subjects, in people who were elderly and middle aged.

In stable conditions, the Hb-CO concentrations in patients at GOLD IV stage were higher than those in patients at GOLD II stage and GOLD III stage. Hb-CO concentrations also inversely correlated with FEV1.

These findings suggest that measurement of Hb-CO may be a useful marker of severity of COPD. In this study, increased Hb-CO in patients with COPD is consistent with that observed in previous studies in patients with COPD, bronchial asthma, pneumonia, and interstitial lung disease (15,16), in which increased Hb-CO might relate to inflammation in the airway and/or lung parenchyma. Airway inflammation (17) and production of reactive oxygen species(18) might be associated with increased Hb-CO(12) in patients with COPD.

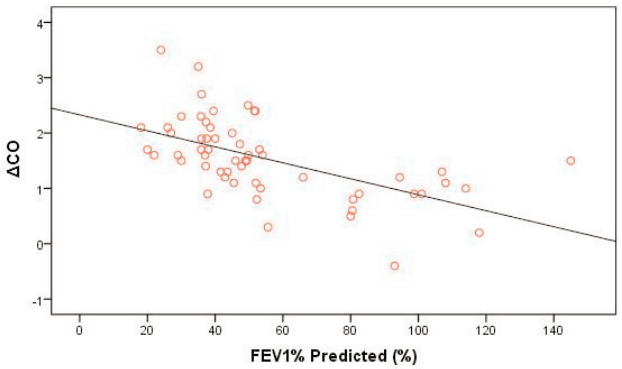


Figure 4— Correlation between ΔCO and FEV1 (p<0.001, r=-).

Yasuda et al. reported that Hb-CO concentration was inversely correlated with both FEV1 and arterial blood O2 (PaO2) concentrations (2). In 4 patients with FEV1 less than 40%, Hb-CO concentrations were higher than 1.4% and in 5 patients with FEV1 less than 50%, Hb-CO concentrations were higher than 1.2%. In our study, FEV1 levels were <40% in 23 patients and Hb-CO concentrations were higher than 1.4% in these patients. These findings suggest that measurement of Hb-CO may be a useful marker of severity of COPD.

In severe airway obstruction, arterial Hb-CO might be increased because of reabsorption of CO and estimation of Hb-CO concentrations from exhaled CO may yield inaccurate results, but this might reflect endogenous production of CO (2). In the current study, patients exhaled CO levels were significantly higher than those of controls and Hb-CO concentrations were correlated with exhaled CO.

In several studies ΔCO levels have been found to be higher in patients with inflammatory pulmonary diseases and COPD patients. ΔCO levels were higher in severe COPD than in stable disease (19).

Our results show that the magnitude of ΔCO increases in direct proportion to the degree of airflow obstruction. ΔCO levels were higher in GOLD 4 COPD than in GOLD 2 COPD (p<0.05), and ΔCO was correlated with arterial Hb-CO concentrations. The current results indicate that the magnitude

of ΔCO caused by airflow limitation is clinically relevant in subjects with severe degrees of airflow obstruction and that lungs produce most of the endogenous CO.

There were some limitations of our study; firstly we evaluated exsmokers with anamnesis of patients, we could not measure any parameter that shows objective criteria for smoking cessation, we should measure urine cotine concentrations; secondly we classified COPD only spirometric findings of patients and finally we didn't calculate the exacerbation risk of patients. In assessment of exacerbations, all patients and controls evaluated with clinical symptoms, radiologic and laboratory findings.

In conclusion, arterial Hb-CO measures are useful in the monitoring of disease activity in patients with chronic obstructive pulmonary disease (COPD). Patients needed to stop breathing for 20 seconds to measure the exhaled CO concentrations. This procedure was difficult to accomplish for patients with COPD. Hb-CO concentrations can be measured at the same time as the blood gas analysis. The measurement of arterial Hb-CO concentration may be a simple and valuable marker to monitor disease activities in patients with COPD.

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Turkish Journal of Geriatrics
2014; 17 (3) 228-233

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Geliş Tarihi: 19/01/2014
(Received)

Kabul Tarihi: 14/04/2014
(Accepted)

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RESEARCH

INVESTIGATION OF SKIN CANCER IN THE GERIATRIC AGE GROUP

ABSTRACT

Introduction: With the increase in lifespan, age related diseases including cancer also increase. With this in mind, in our study we evaluated treatment methods and results of patients who were older than age 65 and operated for skin cancer in the Plastic Surgery Clinic.

Material and Method: Patients older than age 65 who were operated between 2010 and 2014 for skin cancer in the Department of Plastic Surgery were included in our study. Age, gender, diagnosis, localization, operation, lymph node dissection and additional treatments were analysed.

Results: 91 geriatric patients with skin cancer were detected. The average age of patients was 74.4 years. 47 (51.65%) patients were female; 44 patients (48.35 %) were male. With respect to diagnosis, 58 (63.74%) had basal cell carcinoma, 27 (29.67%) had squamous cell carcinoma, and in 6 (6.59%) patients cutaneous melanoma was detected. A review of surgical operations showed that 22 (24.17%) patients had lesion excision + primary suturation, 19 (20.88%) had lesion excision + graft repair, 48 (52.75%) had lesion excision + local flap repair, and 2 (2.20%) had amputation.

Conclusion: In recent years, skin cancer, especially the incidence and mortality of cutaneous melanoma, has been seen more frequently in elders, compared to younger patients. In health controls, the mortality of skin cancer may be reduced by taking into account the geriatric age group.

Key Words: Geriatrics; Aging; Carcinoma, Basal Cell; Carcinoma, Squamous Cell; Melanoma.

ARAŞTIRMA

GERİATRİK YAŞ GRUBUNDA CİLT KANSERİ OLGULARININ İRDELENMESİ

ÖZ

Giriş: Yaşam süresindeki artışla birlikte yaşla ilişkili hastalıklar, bunların içinde kanserde olacak şekilde artmaktadır. Çalışmamızda bu amaçla Plastik Cerrahi servisinde cilt kanseri nedeniyle ameliyat edilen 65 yaş üstü hastaların tedavi yöntemleri ve sonuçları değerlendirildi.

Gereç ve Yöntem: Çalışmaya 2010-2014 yılları arasında Plastik Cerrahi Anabilim Dalı'nda cilt kanseri nedeniyle ameliyat edilen 65 yaş üstü hastalar dahil edildi. Hastaların, yaşları, cinsiyetleri, tanıları, lokalizasyonu, yapılan işlemler, lenf nodu diseksiyonları ve verilen ek tedaviler sınıflandırıldı.

Bulgular: 91 cilt kanserli geriatrik hasta olduğu tespit edildi. Hastaların yaş ortalaması 74,4 olarak bulundu. Hastaların 47 (51,65%)'si kadın, 44 (48,35%) erkek idi. Hastaların tanıları incelendiğinde 58 (63,74%) hastada bazal hücreli karsinom, 27 (29,67%) hastada skuamöz hücreli karsinom ve 6 (6,59%) hastada kutanöz melanoma olduğu saptandı. Yapılan cerrahi işlemler incelendiğinde 22 (24,17%) hastada lezyon eksizyonu + primer sütürasyon, 19 (20,88%) hastada lezyon eksizyonu + greftle onarım, 48 (%52,75) hastada lezyon eksizyonu + lokal fleple onarım, 2 (2,20%) hastada ampütasyon yapıldı.

Sonuç: Yaşlılarda cilt kanseri özellikle kutanöz melanoma insidans ve mortalitesi son yıllarda genç hastalardan daha fazla artmıştır. Sağlık kontrollerinde geriatrik yaş grubuna dikkat edilerek cilt kanserleri ile ilgili mortalite azaltılabilir.

Anahtar Sözcükler: Geriatri; Yaşlanma; Karsinom, Bazal Hücreli; Karsinom, Skuamöz Hücreli; Melanom.

INTRODUCTION

At the present time, as a result of the benefits of modern medicine, there is an apparent increase in lifespan. As a result, the proportion and life expectancy of the elder population are increasing (1-4). Elderly people want to enjoy their life to the full by taking an active part in a social life and professional projects within some fields (4). Census data indicates that in future years, the number of people within the geriatric age group will increase substantially. The fastest growing part of this population is composed of people over 85 years old (5).

Together with the increase in lifespan, age related diseases including cancer also increase (2,6,7). In geriatric patients, the prevalence of skin problems is very high. This rate may reach 65%, and as people grew older multiple skin problems are observed. Epidemiological studies performed on the elderly population may help to guide in planning for the health care which will be given to these older patients (8).

With this aim, in our study, patients who were older than age 65 and operated for skin cancer in the last 4 years in the Plastic Surgery Clinic were evaluated treatment methods and results of patients.

MATERIALS AND METHOD

Patients older than age 65, who were operated for skin cancer between 2010 and 2014 in the Department of Plastic Surgery, were included in our study. It was a retrospective study. Age, gender, diagnosis, localization, operation, lymph node dissection and additional treatments of patients were retrospective analysed from the medical records of patients. The study protocol was carried out in accordance with the Declaration of Helsinki and was approved by the Ethical Committee of the Faculty of Medicine of Yüzüncü Yıl University.

RESULTS

As a result of screening tests, 91 geriatric patients with skin cancer were detected. The age range of patients was 65-94, and the average age was found to be 74.4. 47 (51.65%) patients were female; 44 patients (48.35%) were male. When diagnoses of patients were examined, we found that 58 (63.74%) patients had basal cell carcinoma, 27 (29.67%) of patients had squamous cell carcinoma and 6 (6.59%) had cutaneous melanoma. The localization of lesions is presented in Table 1. When surgical operations were examined, 22 (24.17%) patients had lesion excision + primary saturation, 19 (20.88%) patients had lesion excision + graft repair, 48 (52.75%) patients had lesion excision + local flap repair, and 2 (2.20%) had amputation (Table 2). When additional therapies applied due to cancer were examined, 4 patients (4.39%) with squamous cell carcinoma had radiotherapy, while 2 patients (2.19%) with squamous cell carcinoma and 2 patients (2.19%) with cutaneous melanoma had chemotherapy.

Table 1— Localization of Lesions

	Basal Cell Carcinoma	Squamous Cell Carcinoma	Cutaneous Melanoma
Medial canthal region	7	1	
Lateral canthal region	1		
Upper eyelid	1		
Lower eyelid	4	1	1
Malar region	8	5	
Nose	19	3	
Scalp	2	1	
Ear	3	4	
Forehead	3	1	
Eyebrow, temporal region	5	1	
Nasolabial sulcus	1	2	
Perioral region	2	2	
Body	1	1	
Upper extremity	1	5	
Lower extremity			5
Total	58	27	6

Table 2— Surgical Treatment Options.

	Lesion Excision + Primary Saturation	Lesion Excision + Graft Repair	Lesion Excision + Local Flap Repair	Amputation
Basal cell carcinoma		17	9	32
Squamous cell carcinoma	5	6	15	1
Cutaneous melanoma		4	1	1
Total	22	19	48	2

Discussion

Aging is not a standard process more or fewer physiological changes can emerge. There is heterogeneity among elders: each person should be considered separately (9). Elderly patients carry much more of the disease burden (10), with disproportional complication and mortality rates, because accompanying diseases and decreased physiological reserves are more common in this age group (11). The aging process affects all organ systems. Functional loss can occur in all cell types and organs (12). With lifelong effects of extrinsic injury and peripheral effects (like sun exposure), structural and physiological changes caused by the coexistence of the intrinsic effects of aging constitute an apparent sensitivity to dermatologic disorders (13). Skin problems that emerge with age are elasticity decline, fragility, dryness and vascular visibility. Wrinkles, actinic keratosis, solar elastosis, collagen injury, and sebaceous gland hypertrophy are seen due to sun exposure (14).

Skin cancer reflects the relation between age and ionising radiation (7). The frequency of skin cancer is higher in elderly patients, and frequently nonmelanoma skin cancers are observed. Along with the increase in life span of the population, this type of skin cancer has also increased. The modification of surgical treatment in elderly patients has raised some questions that we addressed in this study (7). Skin cancers are evaluated in 2 groups: Melanoma and Nonmelanoma cancers. The American Cancer Society recommends a cancer-related check-up, including skin examination, every three years in patients 20 to 40 years of age and yearly in patients older than 40 years. It also recommends that patients perform a skin self-examination monthly (15).

Nonmelanoma skin cancers include both basal cell carcinoma and squamous cell carcinoma. In general, 80% of skins cancers are observed to be basal cell carcinoma (BCC), and 20% are squamous cell carcinoma. BCC is the most frequent cancer type. Traditionally, cumulative sun exposure has been found to cause both basal cell carcinoma and squamous cell carcinoma (15,16). Basal cell carcinoma is seen in the head-neck region at the rate of 86%, and in the body and extremities at the rate of 7% (16). BCC has 5 major histopathological patterns: nodular (21%), superficial (17%), micronodular (15%), infiltrative (7%) and morpheaform (1%). The mixed pattern includes 2 or more histological patterns. It comprises approximately 40% of cases (15). Electrodesiccation, curettage, cryotherapy, topical imiquimod or fluorouracil use, surgical excision and radiotherapy are used as therapies (15,16). Posttreatment recurrence risk depends on multiple factors such as localization, size, histological subtype, age, gender, immune status and patient affect (15). Mohs micrographic surgery reduces the recurrence rate. For example, in elderly patients for whom radiotherapy excision is not possible, it may be applied because of the high risk in large lesions and the accompanying comorbid medical status. At the same time, it may be used in nonmelanoma skin cancers, large tumors in which complete excision cannot be carried out, or in high metastasis risk situations (16). In our study, the majority of cases, compatible with the literature, consist of 63.74% (58 patients) with basal cell carcinoma. Almost all cases (except for 2) were found within the head-neck region, most frequently in the nose (Figure 1). Surgical excision was the preferred treatment in all cases. 17 (18.68%) patients had lesion excision + primary saturation, 9 (9.89%) patients had lesion excision + graft repair, 32 (35.16%) patients had lesion excision + local flap repair. No additional treatment was required, and there has been no recurrence.

Squamous cell carcinoma most frequently is seen in the face, hand and forearm. Actinic keratosis squamous cell carcinoma is the precursor lesion (16). Neoplastic transformation of epidermal keratinosis is triggered by UV (15). Other major risk factors include chronic disease or injured skin (ulcer, sinus, tracts), exposure to UV, radiation, immunosuppression and xeroderma pigmentosa (15,17).

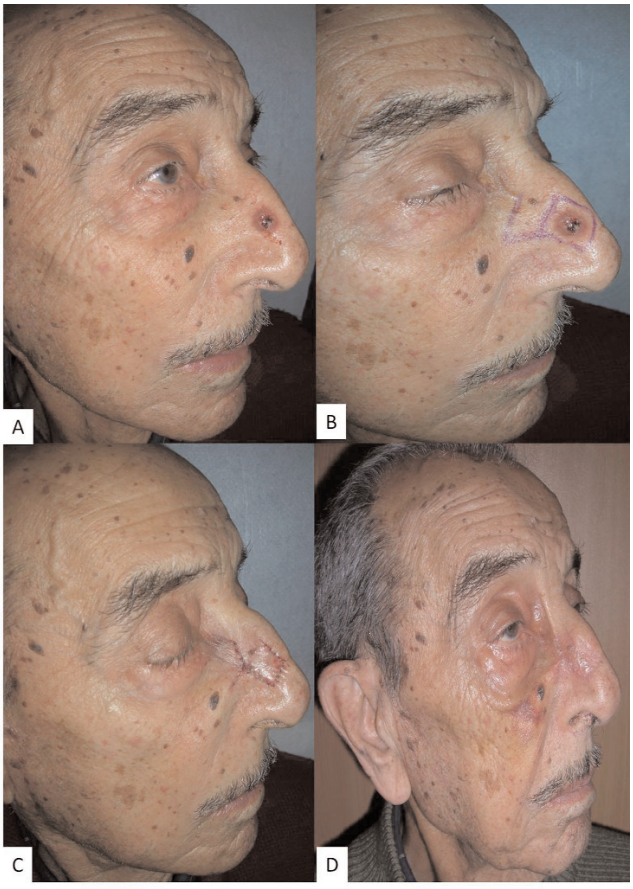


Figure 1— (A) Preoperative appearance of basal cell carcinoma on the nose. **(B)** Appearance of the preoperative planning. **(C)** Postoperative appearance of the early result after flap repair. **(D)** Postoperative appearance of the late result.

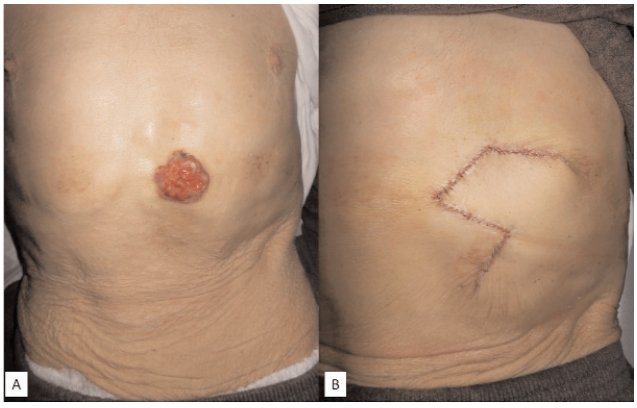


Figure 2— (A) Preoperative appearance of squamous cell carcinoma on the body. **(B)** Postoperative appearance of the early result after flap repair.



Figure 3— (A) Preoperative appearance of cutaneous melanoma on the right foot. **(B)** Postoperative appearance of late result after repair: split thickness skin graft.

Squamous cell carcinoma involves local infiltration and expansion. In 5% of cases, distant metastasis develops through hematogeneous spread. Electrodesiccation, curettage or cryotherapy are used in small, low risk lesions. Mohs micrographic surgery is the first choice of treatment. SCC is unique in relation to radiotherapy; this treatment is used in high risk areas, where surgery might be difficult to accomplish (15). Squamous cell carcinoma was detected in 29.67% (27) of our patients. While 21 lesions were observed in the head-neck region (Figure 2), 6 lesions were observed in the body and extremities. Surgical excision was the preferred treatment in all cases and lymph node dissection was not carried out. 5 (5.49%) patients had lesion excision + primary saturation, 6 (6.59%) patients had lesion excision + graft repair, 15 (16.48%) patients had lesion excision + local flap repair and 1 (1.09%) patient had amputation. In 4 patients, besides surgical treatment, radiotherapy was applied, and in 2 patients chemotherapy was added to the treatment.

Among the patients with cutaneous melanoma, the most important group consisted of patients aged 65 and older (1). In America and Europe, especially in the geriatric age group, melanoma has been increasing and in this new century it will become an important public health problem. The incidence of cutaneous melanoma among patients over 65 years of age has increased 10 times more than the incidence among patients under 40 (1). Cutaneous melanoma is characterized by lower survival in elderly patients. This is attributed to age-related

weak prognostic factors (1,18). As people grow older, Breslow thickness, incidence of ulceration and regression, and the proportion of male patients increase. All of these are weak prognostic factors. Another cause of mortality in elderly patients is an ageing immune system. As people grow older, immune system function decreases and as a result its capacity to fight against infection and malignancy decreases; in addition, atrophy in skin lymphatics contributes to a decrease in immune response (1).

Elderly people are less observant of their own skin changes; they examine themselves less frequently. Compared to young people, they participate in skin cancer screening programs less frequently (1). They pay less attention to early symptoms; therefore they are at risk for the progression of the disease (1). In elderly patients, more ulceration and bleeding are observed; this situation indicates that the lesion has progressed (1,19). Hanrahan et al. (20) suggest that lentigo maligna melanoma increases in elder patients due to its late presentation, because this histological type shows slow progress over a long term. The increased rate of nodular melanoma in elderly patients may be due to the difficulty in receiving an early diagnosis (1,19). Nodular melanoma shows rapid progress and early symptoms and signs of melanoma are often missed. The diagnosis of nodular melanoma is complex, and recognition of the clinical parameters is difficult. As it shows rapid progress, it becomes difficult to establish an early diagnosis (1).

An excisional biopsy ensures a definitive diagnosis that is preferred for surgical excision of the primary melanoma (1,2,21). An incisional and punch biopsy might be preferred in elderly patients in some cases, such as large pigmented lesions; however, as it includes only a small part of the lesion it makes diagnosis difficult for the pathologist (1). In melanoma, the excision border depends on tumor thickness and does not affect general survival; however, it is important in the determination of local recurrence risk (1). Radiotherapy is used in cases that are not appropriate for surgery, with a relatively low risk for recurrence. A sentinel lymph node biopsy ensures evaluation of regional node status and in general it is advised if the tumor thickness is more than 1 mm (1,21). Although mortality caused by melanoma increases, there are fewer positive lymph nodes in elderly patients (1). Complete lymph node dissection is advised after a positive sentinel lymph node biopsy.

In general, interferon treatment is preferred in patients with no accompanying serious disorder and who are expected to be monitored for more than 10 years. Side effects of interferon treatment in elderly patients cannot be tolerated. Therefore, its risks and benefits should be carefully evaluated in patients over age 75 (1). In inoperable in-transit or satellite skin metastasis, isolated extremity perfusion with melphalan (which may be combined with tumor necrosis factor alpha) can be used. It eliminates macroscopic disorder in more than 50% of patients; therefore, the requirements for amputation palliative care disappear. Toxicity and its complications are similar to those of a younger patient group; age is not a contraindication (1).

In our study, cutaneous melanoma was observed in 6 (6.59%) of our patients: 2 females and 4 males. While 1 of the lesions was in the face region, 5 lesions were detected in a lower extremity. Excision flap repair was preferred for 1 (1.09%) lesion in the face; excision graft repair was preferred for 4 (4.39%) lesions in lower extremities (Figure 3) and finger amputation was preferred for 1 (1.09%) lesion. In a cutaneous melanoma case in a foot, as the sentinel lymph node biopsy was positive, inguinal lymph node dissection was added to the treatment. In 2 cases with cutaneous melanoma, chemotherapy was applied in addition to surgical treatment.

To sum up, progress can be characterized by a rapid increase in the number of elderly groups within the population. The relationship between skin cancers and age and cumulative sun exposure is known. In relation to this, in recent years skin cancer, especially cutaneous melanoma incidence and mortality, has increased more in the elderly than in younger patients. The overall survival rate is lower in elderly patients; often a diagnosis is established late due to weak prognostic features. In order to establish an early diagnosis, check-up programs that include skin cancer screening tests should be taken into account. In particular, monitoring of elderly patients who cannot carry out their own inspections completely should be made at certain intervals. We think can be provided increasing the survival rate in all cases with early diagnosis and appropriate surgery treatment.

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Turkish Journal of Geriatrics
2014; 17 (3) 234-241

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Geliş Tarihi: 06/05/2014
(Received)

Kabul Tarihi: 20/06/2014
(Accepted)

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RESEARCH

MASSIVE RETRACTED IRREPARABLE ROTATOR CUFF TEARS: WHAT IS THE EFFECT OF CONSERVATIVE THERAPY?

ABSTRACT

Introduction: Massive, irreparable, retracted cuff tears, without surgical intervention need to be treated with conservative therapy. In this study we aimed to determine the efficacy of conservative treatment in such tears.

Material and Methods: We retrospectively reviewed 33 patients with massive rotator cuff tears treated nonoperatively. Data were obtained from direct examination, medical records, plain radiographs, and magnetic resonance imaging (MRI). Radiographic classification has been made by plain AP views. The fatty muscle degeneration and the stage of retraction of the cuff were evaluated with MRI. Rehabilitation program was given to all patients.

Results: The mean age at the initial examination was 71 (range, 50–84) years. The mean follow-up time was 5.5 (range, 2-10) years. Patients with Grade 3-5 tears and Stage III retractions had a higher incidence of fatty muscle degeneration of the subscapularis muscle. Deltoid muscle strength was found to be increased significantly at the latest follow-up.

Conclusion: Exercise therapy should be kept in mind as a kind of rehabilitation method in patients with a symptomatic massive rotator cuff tear. It's essential that more randomised clinical investigations have to be conducted to find out the best management practice for this condition.

Key Words: Rotator Cuff; Physical Therapy Modalities; Treatment Outcome.

ARAŞTIRMA

MASİF RETRAKTE ONARILAMAZ ROTATOR KILIF YIRTIKLARINDA KONSERVATİF TEDAVİNİN ETKİNLİĞİ NEDİR?

ÖZ

Giriş: Cerrahi girişim yapılmamış masif, retrakte, onarılamaz rotator manşet yırtıkları konservatif yöntemlerle tedavi edilir. Bu çalışmada bu yırtık tiplerinde konservatif tedavinin etkinliğinin değerlendirilmesi amaçlanmıştır.

Gereç ve Yöntemler: Masif rotator manşet yırtığı nedeniyle cerrahi dışı yöntemlerle tedavi ettiğimiz 33 hasta geriye dönük olarak incelendi. Hastaların verileri, direk muayene bulguları, tıbbi kayıtları, radyografileri ve manyetik rezonans görüntülerinden (MRG) elde edildi. Radyolojik sınıflandırma ön-arka direk grafilerine göre yapıldı. Retraksiyon evresi ve yağlı dejenerasyonları MRG ile incelendi. Tüm hastalara rehabilitasyon programı uygulandı.

Bulgular: İlk muayenede hastaların ortalama yaşları 71 (dağılım, 50-84) yıldı. Ortalama takip süresi 5,5 (dağılım, 2-10) yıldı. Grade 3-5 yırtıklar ve Evre III retraksiyonları olan hastaların subskapuler kaslarında daha fazla yağlı dejenerasyon saptandı. Son kontrolde deltoid kas güçlerinin anlamlı düzeyde artmış olduğu saptandı.

Sonuç: Semptomatik masif rotator manşet yırtığı olan hastalarda egzersiz tedavisinin bir rehabilitasyon yöntemi olduğu unutulmamalıdır. İleriye dönük, randomize klinik çalışmaların tasarlanmasıyla bu durumun en iyi tedavi yöntemi ortaya konabilir.

Anahtar Sözcükler: Rotator Kaf; Fizik Tedavi; Tedavi Sonucu.

Introduction

Degenerative rotator cuff tendinopathies are the most common disabling shoulder problems faced by the older population (1). Milgrom et al. (2) in 1995 reported that a marked increase in cuff tears was found in those over age 50 in their 90 asymptomatic adult series. Studies also emphasized that 8-10% of all asymptomatic cuff tears are massive and more than two rotator cuff tendons are totally impaired (2). In these cases, in the presence of a balance between the muscles in transverse and coronal planes, the shoulder may function normally (3).

Although many patients with irreparable cuff tears function well, the American Academy of Orthopaedic Surgeons (AAOS) prefers surgery in these cases, apart from rehabilitation (4-5). It has been shown that surgical rotator cuff repair produces much less successful results in the elderly, especially in those with retraction (6-7). Rockwood et al. used surgery in 57 patients with an average age of sixty years. They reported that an unfavorable outcome was observed in shoulders in which the anterior part of the deltoid muscle was weak or absent, or in which a previous acromioplasty and attempted repair of the rotator cuff had been performed. They also reported that as a part of surgery, orthopaedic rehabilitation was also important in patients' clinical recovery, especially in those with unfavorable outcomes (5).

There are several studies examining the outcomes of surgical treatment modalities in the literature; however, the role of rehabilitation in patients with massive, irreparable, retracted cuff tears is still debatable (8-9). In 2007 Ainsworth and Lewis (10) reviewed the evidence for the effectiveness of therapeutic exercise for the treatment of full thickness tears of the rotator cuff. Based on the observational studies of lower scientific merit, they concluded that the findings suggest that some evidence exists to support the use of exercise in the management of full thickness rotator cuff tears (10).

In this study we evaluated the role of rehabilitation in adult patients with massive, irreparable and retracted cuff tears; we aimed to compare the results with literature and to examine the role of conservative treatment in clinical follow-up.

Materials and Methods

Records of patients with a diagnosis of rotator cuff tears were screened from a hospital electronic database. 44 patients were diagnosed and treated by our PMR center between March 2010and January 2012. All patients were contacted by phone; 40 patients were reexamined. Patients with neurological deficit, inappropriate laboratory data, no follow-up records, those who were operated, and those not willing to participate were excluded from the study. This exclusion left 33 patients suitable for further evaluation. The strength of the anterior, posterior and lateral deltoids was determined as the mean of the values gained by a horizontal hand scale fixed to the wall. Four investigators (MUO, ABS, TB, MA) reviewed the cases in order to diagnose a massive tear. Advanced and inspectable weakness and wasting of the supraspinatus and infraspinatus, infraspinatus lag, rupture of the long head of the biceps tendon, more than two tendon tears confirmed by MRI, and refusal of any surgical intervention were the inclusion criteria of this study sample. 33 patients (19 male, 14 female) were included in the study, which was conducted according to the Helsinki Declaration 2008. An informed consent was obtained from each patient.

Demographic data (age, gender), history (operation, chronic diseases, trauma), clinical examination records (locomotor), follow-up records (before and after rehabilitation programme), and laboratory (ESR, CRP and full blood count) and radiological [plain radiographs, magnetic resonance imagings (MRI)] data of 33 patients were evaluated retrospectively.

Clinical Examination and Follow-up

Initial and follow-up range of motion degrees were measured with the same goniometer, and muscle strength by manual examination by the same authors (MT, AYG). The physical examination and functional evaluation were carried out according to the American Shoulder and Elbow Surgeons Standardized Shoulder Assessment Form (ASES) and the

Table 1— Radiographic Classification of Massive Rotator Cuff Tears (18).

Grade	AHI (mm)	Acetabulization
1	≥6	-
2	≤5	-
3	≤5	+
4 in the presence of glenohumeral narrowing		
4a	<7	-
4b	<7	+
5 Humeral head collapse is present		

AHI= Acromiohumeral interval.

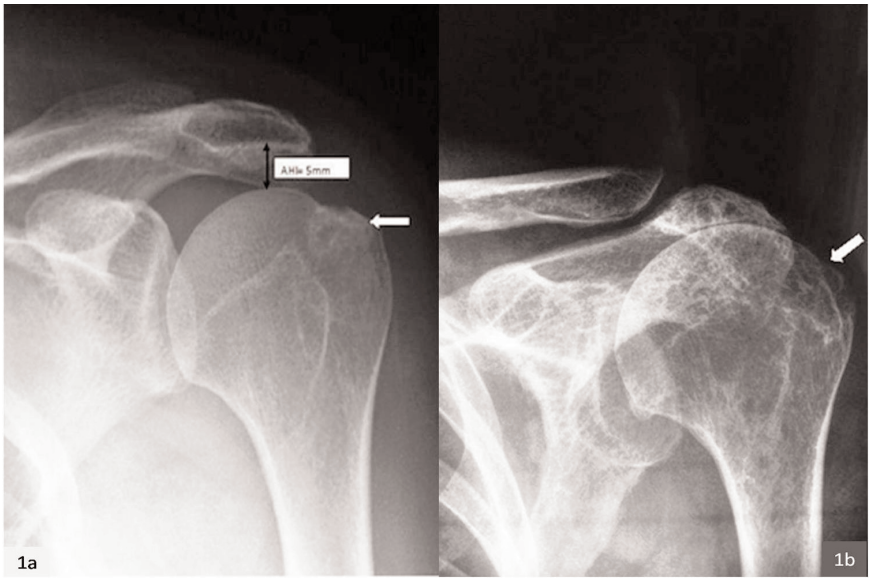


Figure 1— AP roentgenogram of the same patient at the initial presentation **(a)**, and at the latest follow-up **(b)**. The Grade 2 (AHI=5mm) rotator cuff tear progressed to Grade 4 (arthritic changes; glenohumeral narrowing) and the cyst (white arrow) at the greater tuberosity has enlarged after a 45 months followup.

University of California at Los Angeles (UCLA) scale (11-12). Pre- and post-rehabilitation recorded ASES scores (max 100 points), UCLA scale scores (max 35 points) and visual analogue scores (VAS) were evaluated.

Radiology

Radiographic classification of massive rotator cuff tears by plain anterior-posterior (AP) views were made according to Hamada et al. (13) by the same radiologist (KAG). To grade the severity of disease, we used the modified classification of Hamada et al. (13) (Table 1). We have further summarized this classification as grade 1 (no arthritic changes), grade 2 (prearthritic changes) and grades 3-5 (arthritic changes) for easy understanding (13-14) (Table 1) (Figure 1).

Tendon tears were diagnosed by MRI (1.5-T system, Signa Horizon LX; GE Healthcare, Milwaukee, WI) and by the same radiologist (KAG). T1-weighted images were used to determine the degree of fatty muscle degeneration. The tear was defined as massive when detachment of two or more entire tendons and typically at least the supraspinatus and infraspinatus tendon were observed (2). The criterion for a massive rotator cuff tear was a fluid-filled gap and retraction in the tendon noted on the T2-weighted coronal oblique or transverse images (15). The rates of the fatty degeneration to the whole muscle mass on scapula Y planes on MRI were calculated using standard millimetric papers (16) (Figure 2). The fatty muscle degeneration in each cuff component was further evaluated according to the five-stage classification of Fuchs et al. (17) (Figure 3). Further, the stage of retraction of the cuff was evaluated by the staging system proposed by Patte (18). According to this staging system, stage I is identified when the tendon stump is not or a little retracted, leaning near the original tendon insertion. When the tendon stump is retracted, but does not pass the glenoid rim, it is called as stage II. In stage III, the stump is retracted back passed the glenoid rim (Figure 4). The strength of the anterior, posterior and lateral deltoids was determined as the mean of the values gained by a horizontal hand scale fixed to the wall. Four investigators (MUO, ABS, TB, MA) reviewed the cases and diagnosed a massive tear when at least two tendons were not visible around the tuberosity. If the diagnoses differed between observers, a final diagnosis was determined by consensus. The tears were stated as irreparable when: (1) at least two tendons were not visible around the tuberosity, (2) the fatty degeneration was phase 3 and above, and (3) the retraction was staged at II and above. The positive predictive value (ratio of massive cuff tears in positive tests) was found to be 0.95 by MRI.

All the patients graded as Grade 1 or 2 at the initial MRI examination were re-examined for any grading changes at follow-up. The first MRI staging (done at the first attendance of

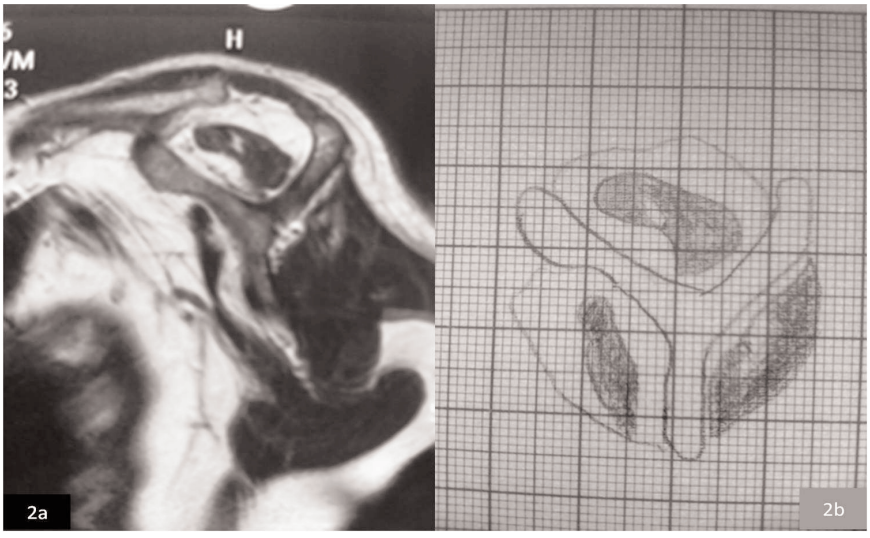


Figure 2— Calculation method of the rate of the fatty degeneration to the whole muscle mass on scapula Y planes on MRI **(a)** by using standard millimetric papers **(b)**.

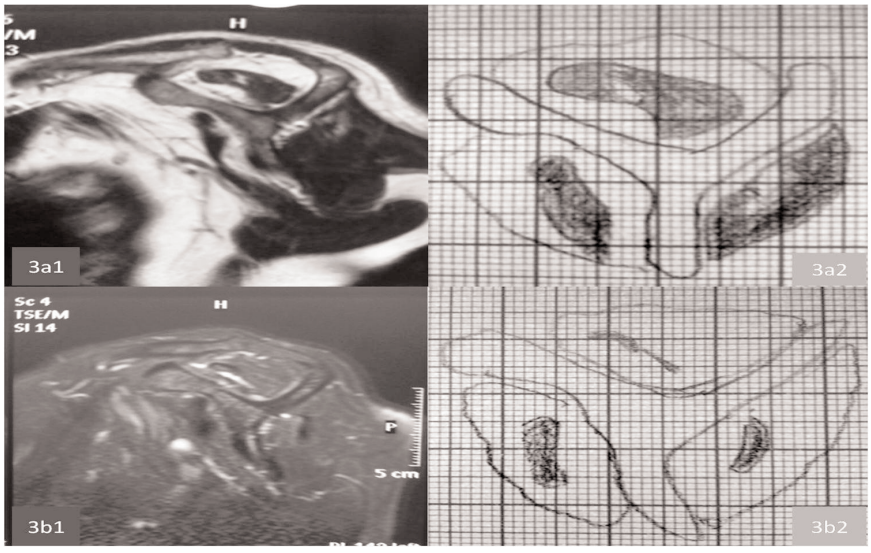


Figure 3— T1-weighted scapular-Y MRI of the same patient at the initial presentation **(a)**, and T2-weighted scapular-Y MRI at the final examination **(b)**. Note that phase 3 fatty degeneration of supraspinatus and subscapularis muscles and phase 2 fatty degeneration of infraspinatus progressed to phase 4.

the patient to PTR outpatient clinic) was recorded as initial MRI staging and the second MRI staging (done on follow-up examination) was recorded as follow-up MRI staging. These patients were divided into two groups: those who remained at Grade 1 or 2 at final follow-up and those who progressed to upper grades at final follow-up (Table 2). Patients were also divided into two groups according to the alterations of retraction stages (Table 2).

Therapy and Follow-up

All 33 patients were treated nonoperatively by physiotherapy and nonsteroidal anti-inflammatory drugs (NSAIDs).

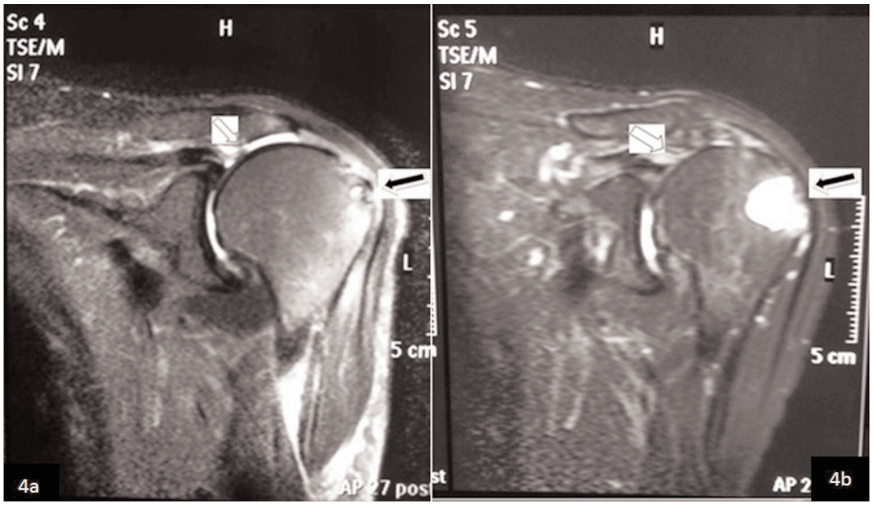


Figure 4— T2-weighted coronal oblique MRI of the same patient at the initial presentation **(a)** and at the final examination **(b)**. Note that the Stage II retraction (white arrow) remained and the cyst at the greater tuberosity (black arrow) has enlarged.

Table 2— Summary of The Rehabilitation Program

Phase	Intervention	Duration
Phase I	Pain control	1-2 weeks
Phase II	Stretching exercises	4-8 weeks
Phase III	Strengthening exercises	2-3 weeks
Phase IV	Maintenance exercises	3-4 months

Patients used medication with a mean of 10 days (min-max: 5-15 days), and close monitorization was made for systemic adverse effects. This treatment was conducted according to nonsurgical protocol, which was defined and introduced by Rockwood et al. (19) and supervised by two physiatrists (AYG, ABS). This rehabilitation programme consisted of four phases (Table 3).

Table 3— Number of Torn Tendons and Progression of Grades (G) and Stages (S).

	Mean Age (years)	Gender (M/F)	Side (D/nD)	RC Torn Tendons (SSp + ISp / more than SSp + ISp)	LHB Tendon (T/nT)
Grade					
G 1 or 2 to G 2 (n = 17; Group 1)	70	8/9	10/7	6/11	3/26
G 1 or 2 to G 3, 4, or 5 (n = 9; Group 2)	68	6/3	5/4	1/8	1/7
p	0.522	0.440	0.389	0.089	0.134
Stage					
S 1 or 2 to S 2 (n = 2; Group 1)	74	1/1	2/0	1/1	0/2
S 1 or 2 to S 3 (n = 6; Group 2)	70	2/4	4/2	2/4	3/3
p	0.613	0.395	0.325	0.094	0.165

G= Grade; S= Stage; n= number of patients; M=Male; F=Female; D= dominant; nD= non-dominant; RC = rotator cuff; SSp = supraspinatus; ISp = infraspinatus; LHB = long head of the biceps tendon; T=torn; nT= not torn (Mann-Whitney U test).

Differences in the aforementioned parameters (range of shoulder motion, muscle testing, radiological data and ASES-UCLA scoring) after the acute phase and at final follow-up were determined using the Mann-Whitney U test and the Student's t-test. Alterations between the grades and retractions during the follow-up were further evaluated by the chi-square test. Differences in patient characteristics, incidence of concomitant tendon tear, and degree of fatty muscle degeneration of rotator cuff components among grades and stages were further determined using multiple analysis of variance. All analyses were performed using SPSS II Version 17.0 (SPSS Inc., Chicago, IL).

In this retrospectively designed study, we sought the answers for: (1) do the patient characteristics and MRI findings at initial examination and final follow-up differ between the radiographic grades and retraction stages?; and (2) what factors affect the progression to a higher grade?

RESULTS

33 patients were included in the study. The mean age was 71 (range, 50–84) years. Mean duration of the disease was five years and six months (range, 2 to 10 years).

According to the stages of Patte, 15 patients were identified as grade I, 11 patients were identified as grade II, and seven patients were graded as stage III-IV by their initial MRI.

The mean active forward flexion and external rotation increased from 105º to 160º (p=0.0272) and from 41º to 44º (p>0.05), respectively, after rehabilitation. The mean strength of the supraspinatus and infraspinatus muscles did not differ significantly. However, the increase in the mean muscle strength of the deltoid was found to be statistically significant (p=0.0412). The mean ASES and UCLA scores increased significantly (p=0.0218 and p=0.0314, respectively). The improvement in VAS scores was also significant (p=0.0378) (Table 4).

Radiological grades and retraction stages of the patients recorded at the initial examination and at follow-up are presented in Table 5. Radiological grades and stages of retractions did not differ significantly, either at the first examination, or at the follow-up (McNemar's x^2=3.60 and x^2=1.77, p>0.05, respectively). In other words, grades of plain radiological changes and stages of retraction were strongly correlated with each other (r=0.818).

Further evaluation according to the plain radiological grading of the massive rotator cuff tears was conducted. Overall results showed that patients with Grade 1 or 2 tears were younger than those with Grade 3 to 5 massive cuff rotator tears, whereas concomitant rotator cuff tears and biceps ruptures, and fatty degeneration were more frequent. Similar relationships between Stage III retractions compared to Stage I or II retractions have been obtained.

Table 4— Overall Functional and Statistical Results Pre and Postrehabilitation (n=33).

	Pre-Rehabilitation	Post-Rehabilitation	p
Range of Motion			
Forward flexion	105° (40-150°)	160° (120-170°) 0.0272	
Adduction-Ext rot.	41° (20-75°)	44° (20-75°)	>0.05
Muscle strength			
Infraspinatus	3 (2-4)	3 (2-4+)	>0.05
Supraspinatus	3 (2-4)	3 (2-4+)	>0.05
Deltoid	3 (2-4)	4 (3-5) 0.0412	
ASES scores	25.4 (10-45)	86.7 (63.3-100)	0.0218
UCLA score	10.6 (8-16)	25.6 (17-35) 0.0314	
VAS	8.5 (7.5-10)	3.5 (3-5.5)	0.0378
Fatty degeneration			
Supraspinatus	42.8% (4-60%)	43.8% (24-100%)	>0.05
Infraspinatus	18.6% (2-42%)	22.5% (7-63%)>0.05	
Subscapularis	37.6% (8-53%)	39.2% (10-55%)	>0.05
Teres Minor	16.3% (4-28%)	18.6% (9-58%)>0.05	

ASES= the American Shoulder and Elbow Surgeons Standardized Shoulder Assessment Form; UCLA= the University of California at Los Angeles Scale; VAS= visual analogue scores.

Five of 15 patients (33%) with Grade 1 tears and four of 11 patients (36%) with Grade 2 tears progressed to a higher grade in 68 and 74 months on average, respectively (Table 5). Of the 26 patients with Grade 1 or 2 tears at initial examination, 17 (Group 1) remained at Grade 1 or 2 and nine (Group 2) progressed to Grade 3–5 at final follow-up. Initially there were 11stage I, 16 stage II and six stage III retracted tears. At the follow-up, 3 of the stage I retractions (27%) progressed to a higher stage (Table 5).

Discussion

The best management and treatment for a patient with a symptomatic massive rotator cuff tear is still under debate. Although Ellman et al. (12) proposed better outcomes in case of early surgery for any kind of tear, Bartolozzi et al. have reported a patient series treated with conservative management with favorable outcomes (20). Yamada et al. followed up 12 patients with a mean age of 70 and for a mean duration of 48 months (21). They confirmed the diagnosis by arthrogram and treated their patients with intraarticular corticosteroid injection, heat, rotator cuff strengthening exercises and passive range of motion for flexion and external rotation. A mean of 22% improvement in Japanese Orthopedic Association Scores was reported. Ainsworth et al. (22) followed up 10 patients with a mean age of 76, for a mean duration of 3 months. They confirmed the diagnosis by ultrasonography and treated their patients with active anterior deltoid strengthening and patient education. A mean of 10 points of improvement in the Oxford Shoulder Score was noted.

In the present study, we hypothesized that nonsurgical rehabilitation of patients with massive, irreparable and retracted cuff tears can lead to clinical improvement, attracting attention to the option of conservative treatment of such tears. We found that patients with Grade 3-5 tears and Stage III retractions were older. They had concomitant rupture of the long head of the biceps, subscapularis and teres minor tendons and had more fatty degeneration of subscapularis than those with Grade 1 or 2 tears and Stage I or II retractions. In the literature, the shoulder joint is thought to age more by its tendons than by its cartilages, and the incidence of rotator cuff tears has been considered to increase with age. Nove-Josserand et al., (23) in their series, reported that their results confirm that the frequency of rotator cuff tears increases with age. One out of five patients aged 70-90 presented with subacromial impingement, versus one out of three among patients aged over 90 years. In the present study we chose a patient population with massive, irreparable, retracted cuff tears. As the open-surgery techniques are complex and followed by a troublesome postoperative period, they are perhaps most suitable for young and active patients. In older or more sedentary patients, less aggressive approaches such as rehabilitation may be preferable.

In the present study, and possibly as a result of compensation, no decrease was found in the average of active flexion despite the grade and/or retraction progression (24). Walch et al. reported that fatty infiltration of the infraspinatus and subscapularis muscles may lead to teres minor atrophy (25). We found that a longer follow-up period negatively influenced grade progression from Grade 1 or 2 to Grade 3-5, and these results were similar to those of Walch et al. (25). Different from that study, we have also noticed that a longer follow-up period may influence retraction staging.

We have followed up 33 patients, with a mean age of 71 and for a mean duration of 66 months. We have confirmed the diagnosis by MRI and treated the patients with a 4-phase rehabilitation programme. A mean of 60% in ASES and 15% of UCLA scores has been obtained. However, this study is retrospective; randomised clinical investigations may help clinicians to make appropriate decisions during management of such tears.

In summary, patients younger than 65 years, with no more than Grade 2 tears, Stage II retractions and Phase 2 fatty degenerations gained very favorable results from physiotherapy. This may be because younger patients with less damage and more compliance obey the rules of the rehabilitation programme much more, and they also have more tissues to be recycled. However, although fatty degeneration progresses independently, this progression is statistically non-significant. This fact may be explained by a probable misuse of the extremity caused by fear, during the rehabilitative process.

There are several major limitations in our study. First, we lost 25% of our patients to follow-up. Second, our follow-up period was short for observing radiographic degenerative changes. Third, there is no control group, such as an operatively treated sample. In order not to confuse the reader we did not evaluate the alterations of the scoring systems according to grading and staging systems separately. This may be the fourth limitation of this study.

This improvement in VAS was thought to be the result of the physiotherapy, rather than the short-term NSAIDs medication.

Conclusion

The findings of this study suggest that exercise therapy is an option for patients with symptomatic massive rotator cuff tears. When to initiate and what kind of programme to use, and when to refer to a surgeon, are still under debate. Prospectively designed randomised clinical investigations are essential to ensure definitive guidance. Moreover, in order to discover the best management protocol, these investigations have to be conducted using appropriate validated outcome measurements. For successful results to be gained with conservative treatment, adequate patient selection and education of the patients are crucial.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Conflict of Interest Statement

The Authors declare that there is no conflict of interest.

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Turkish Journal of Geriatrics
2014; 17 (3) 242-248

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RESEARCH

THE RELATIONSHIP BETWEEN POSTUROGRAPHIC FALL RISK AND CLINICAL BALANCE TESTS AMONG COMMUNITY-DWELLING OLDER ADULTS

ABSTRACT

Introduction: The aim of this study was to determine whether there is an association between fall risk measured posturographically and clinical balance tests among people who are over 65 years of age, and to identify the discriminative ability of the posturographic fall risk index.

Materials and Methods: Two hundred and twenty participants who were over 65 years of age were included in the study. The balance and fall risk of participants were assessed with the Berg balance scale (BBS) and a posturography device; functional mobility with the Timed Up and Go (TUG) test; lower extremity neuromuscular function with the Chair Stand test (CST) and quality of life with the Short Form-36 (SF-36). Participants were grouped into two, as fallers and non-fallers, on the basis of the past year's fall history.

Results: A total of 78 participant (35.5%) had a history of falling, while 142 (64.5%) of the subjects did not. Age, TUG and posturographic fall risk index of fallers were significantly higher than for nonfallers, whilst some subgroups of the SF-36, BBS and mean CST scores were lower ($p<0.05$). There were negative correlations between posturographic fall risk and the BBS ($r=-0.84$) and CST ($r=-0.40$) yet a positive correlation with the TUG ($r=0.67$) ($p<0.05$). Using the agreement between the posturographic fall risk index and history of falls, the area under the ROC curve was 0.818. In this study, when the cut-off value 51≤ was used, sensitivity was found to be 76.9% and specificity was 73.9%, with a higher value for the Youden index: 0.508.

Conclusion: It was shown that fallers had poorer balance, functional mobility, lower extremity neuromuscular function and quality of life than nonfallers. The study also demonstrated that posturographically obtained fall risk was significantly correlated with clinical balance tests and had good discriminative ability to identify fallers.

Key Words: Aged; Postural Balance; Accidental Falls.

ARAŞTIRMA

TOPLUMDA YAŞAYAN YAŞLI BİREYLERDE POSTUROGRAFİK DÜŞME RİSKİ İLE KLİNİK DENGE TESTLERİ ARASINDAKİ İLİŞKİ

ÖZ

Giriş: Bu çalışmanın amacı, 65 yaş üstü bireylerde posturografik düşme riski ile klinik denge testleri arasında ilişki olup olmadığını değerlendirmek ve posturografik düşme indeksinin ayırt edici kapasitesini belirlemekti.

Gereç ve Yöntem: Çalışmaya, 65 yaş üstü 220 kişi alındı. Katılımcıların denge ve düşme riski; posturografik düşme riski ve Berg denge testi (BDT), fonksiyonel mobilitesi; Zamanlı Kalk-Yürü Testi (ZKYT), alt ekstremite nöromuskuler fonksiyonu; sandalyeye otur kalk testi (SOKT) ve yaşam kalitesi; Kısa Form-36 (KF-36) kullanılarak değerlendirildi. Hastalar son bir yıl içindeki düşme öyküsüne göre; düşenler ve düşmeyenler olmak üzere, iki gruba ayrıldı.

Bulgular: Çalışmaya alınan bireylerin 78'inde (%35,5) düşme öyküsü varken 142'inde (%64,5), düşme öyküsü yoktu. Düşme öyküsü olanların yaş, posturografik düşme riski, ve ZKYT skorları düşme öyküsü olmayanlara göre istatistiksel olarak anlamlı derecede yüksek iken, KF-36 yaşam kalitesinin bazı alt grup skorları, BDT skoru ve SOKT ortalama sayısı ise düşüktü ($p<0,05$). Posturografik düşme riski ile BDT ($r=-0.84$) ve SOKT ($r=-0.40$) arasında negatif korelasyon, ZKYT ($r=0.67$) ile pozitif korelasyon saptandı ($p<0,05$). Posturografik düşme riski ile düşme öyküsü arasındaki uyuma bakıldığında ROC eğrisi altında kalan alan 0,818 idi. Bu çalışmada, cut-off değeri 51 ve üzeri alındığında en yüksek Youden indeks skoru 0,508 ile sensitivite %76,9 ve spesifite %73,9 olarak saptandı.

Sonuç: Düşme öyküsü olanların denge, fonksiyonel mobilite, alt ekstremite nöromusküler fonksiyon ve yaşam kalitelerinin düşme öyküsü olmayanlara göre daha kötü olduğu gösterilmiştir. Çalışmada ayrıca posturografik düşme riskinin klinik denge testleri ile anlamlı olarak ilişkili olduğunu ve düşenleri belirlemede iyi ayırt edici kapasitesi sergilediği gösterilmiştir.

Anahtar Sözcükler: Yaşlı; Postural denge; Düşme.

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Geliş Tarihi: 18/03/2014
(Received)

Kabul Tarihi: 16/04/2014
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Introduction

Falling is a major public health problem for the elderly throughout the world (1). About one third of community-dwelling older adults fall once a year and half of these fall at least twice a year (2). Although there is increasing intervention focused on preventing falls in older people, it is still one of the most significant causes of morbidity and mortality. As a larger proportion of the elderly population in developing countries increasingly lives to an older age, falls will be more prevalent and will be an important cause of disability in the future. Therefore, to identify individuals who are at an elevated risk for falling and who should receive further assessment is mandatory for this population (3).

The usefulness of a screening tool in predicting falls may vary depending on the health status and functional level of the older adults being tested (4). Fall risk screening tools have been especially used to identify frail elderly individuals who are at risk for falling; however, these screening tools are less predictive of falls in community-dwelling older adults (4). Which functional tests of mobility and balance can better screen community-dwelling older adults at risk of falls is unclear. The ability to maintain postural stability is one of the most important factors in fall prediction. The quantitative method of assessing postural stability is posturography (5). Additionally, if posturographic fall risk index cut-off scores can be identified, the clinical usefulness of posturography as a fall screening tool may be improved.

The aim of this study was to determine whether there is an association between the posturographic fall risk index and clinical balance tests among community-dwelling older adults, and to explore whether the posturographic fall risk index can identify those older adults at high risk for falling.

Materials and Methods

Subjects

Community-dwelling older adults who were over 65 years of age and attended the Physical Medicine and Rehabilitation Clinic were enrolled in this study. Individuals were excluded from the study if they were unable to stand or walk independently, unable to cooperate, or living in a nursing home. The study protocol was approved by the university research ethics committee and informed consent was obtained from all individuals who agreed to participate the study. All participants received a comprehensive geriatric assessment at baseline. Subjects were asked about the number of falls in the past twelve months. In this study, a fall was defined as "an episode of unintentionally coming to rest on the ground or lower surface that was not the result of dizziness, fainting, sustaining a violent blow, loss of consciousness, or other overwhelming external factor"(2). Recurrent falling was defined as two or more falls within 12 months. All participants were divided into two categories according to history of falls as fallers or non-fallers.

Evaluation Parameters

The Berg Balance Scale (BBS), is a valid and reliable scale for the assessment of balance in older adults. The BBS consists of 14 tasks that are each scored on a scale of 0-4, for a total possible score of 56, indicating no identified balance difficulties. Scoring is on a 5-point ordinal scale with 0 indicating an inability to complete the task and 4 as independent in completing the task (6). The Turkish version of the BBS was demonstrated to be a reliable and valid scale for the balance assessment of Turkish older adults (7).

All subjects were also tested using a static posturography device the Tetrax Interactive Balance System (Sunlight Medical, Tel-Aviv, Israel). The Tetrax device uses a method based on the assessment of vertical pressure fluctuations on four independent force plates. Standard measurement consists of eight different positions that are held for 32 seconds. The software of the Tetrax system calculates stability, weight distribution, synchronizations, and sway intensity. A fall risk index derived from the balance parameters established by this device has been developed to produce a score that expresses this risk based on the patient's specific balance factors that affect falling. The fall risk index score rates the risk on a scale from 0-100, in which zero indicates no risk of falling and 100 represents the an extreme likelihood of falling (8).

The timed up and go test (TUG) was used to evaluate mobility. The TUG is a balance and gait index which requires subjects to rise from an armchair, walk 3 m at a normal and safe pace, turn around, walk back to the chair, and sit-down. The time required to complete this task is measured in seconds (9).

The chair stand test (CST) is a physical performance test used to assess lower extremity function. A standard chair with arms and a seat height of approximately 43 cm was used for all assessments. The subject was seated in the middle of the chair, back straight, arms crossed over chest, feet flat on floor. From the sitting position, the subject stood completely up, then completely back down, and this was repeated for 30 seconds. The total score was the number of completed chair stands in 30 seconds (10).

The Short Form-36 (SF-36) was used to evaluate quality of life as a general survey of health status in this study. The SF-36 includes eight subscale each score was converted to a range from 0-100, with a higher score indicating a better level of functioning (11). The reliability and validity of the Turkish version of the SF-36 were also demonstrated (12).

Statistics

All statistical analyses were performed using SPSS version 17.0 for Windows (Statistical Package for the Social Sciences Inc, Chicago, IL, USA). Descriptive statistics were used to describe demographic characteristics. For continuous variables, the significance of the differences were analyzed using Student's t-test while categorical variables were analyzed with chi-square tests. Pearson correlation coefficients were calculated to determine the relationship between the posturographic fall risk index and the clinical balance test. Posturographic fall risk sensitivity and specificity indices were computed and used for diagnostic classification of patients with respect to falling status. For each posturographic fall risk score, sensitivity and specificity were computed and graphed in a receiver operating characteristic (ROC) curve. The ROC curved was used to select optimal cut-off posturographic fall risk scores for screening community-dwelling elderly who had a higher fall risk. The Youden's index, positive predictive value, negative predictive value, and positive and negative likelihood ratios were also obtained. In all analyses, p values <0.05 were considered as statistically significant.

Results

A total of 244 individuals were eligible for this study, 24 of whom had to be excluded from the analysis. Of these 24 individuals, 11 could not independently stand, seven were unable to cooperate, five refused to participate and one was

Table 1— Demographic Characteristics of Older Individuals by History of Fall.

	Non-faller (n=142)	Faller (n=78)	p
Gender, n (%)			
Women	80 (56.3)	52 (66.7)	0.135
Men	62 (43.7)	26 (33.3)	
Age, (years) (mean ± SD)	70.26±3.89	71.85±4.56	0.007
BMI, (kg/m^2) (mean ± SD)	26.34±2.91	27.00±2.92	0.109
Marital Status, n (%)			
Married	114 (80.3)	40 (51.3)	<0.001
Widow(er)	28 (19.7)	38 (48.7)	
Living with Whom, n (%)			
Wife or husband	114 (80.3)	40 (51.3)	<0.001
Alone	19 (13.4)	28 (35.9)	
Son or daughter	9 (6.3)	10 (12.8)	
Tetrax (mean ± SD)	42.68±21.38	71.29±23.59	<0.001
BBS (mean ± SD)	47.08±7.05	37.15±10.06	<0.001
CST (mean±SD)	11.32±2.14	9.82±2.44	<0.001
TUG (mean±SD)	12.26±2.45	15.65±3.84	<0.001
Short Form-36			
SF-A	67.95±19.25	49.87±19.49	<0.001
SF-B	67.52±20.25	65.71±20.98	0.531
SF-C	52.20±18.76	49.72±18.54	0.345
SF-D	59.30±17.46	56.59±15.43	0.237
SF-E	80.03±26.66	79.90±28.10	0.973
SF-F	66.37±29.48	54.81±28.51	0.005
SF-G	63.65±12.93	61.78±12.00	0.295
SF-H	57.98±16.48	54.05±19.92	0.140

BBS: Berg-Balance-Scale, CST: Chair-Stand-Test, BMI: Body-Mass-Index, TUG: Timed-up-and-Go test.

living in a nursing home. Therefore, 220 participants who were over 65 years of age were included in this study. The mean age of participants was 70.8 years, and the majority of the participants were female (60%).

Seventy eight (35.5%) of the 220 subjects had a history of falls of whom 58 (26.4%) had one fall and 20 (9.1%) had a recurrent history of falling. Age, TUG and posturographic fall risk index of fallers were significantly higher than that of non-fallers, whilst two scores on two subtests of the SF-36 (physical function and role limitations due to physical problems), BBS and mean CST scores were lower ($p<0.05$). There were no significant differences regarding gender and BMI between fallers and non-fallers (Table-1) ($p>0.05$).

The correlation between the posturographic fall risk and the BBS was high and statistically significant ($r=-0.84$, $p<0.001$). There was a significant negative correlation between posturographic fall risk and the CST ($r=-0.40$, $p<0.001$), and a significant positive correlation with the TUG ($r=0.67$, $p<0.001$).

Using the agreement between the posturographic fall risk index and history of falls, the ROC curve for fall risk index scores was estimated. Area under the ROC curve was 0.818 when comparing fallers and non-fallers (Figure 1). Discriminant statistics for sensitivity, specificity, Youden index, positive predictive value, and negative predictive value for each posturographic fall risk score between 45 to 55, and then every 5 point score out of 100, are given in Table 2, illustrating the agreement between posturographic fall risk and history of falls. In this study, when the cut-off value of 51≤ was used, sensitivity was 76.9% and specificity was 73.9%, with a higher value for the Youden index: 0.508. Scores 51≤ represent a negative predictive value of 86%, and a positive predictive value of 61% (Table 2).

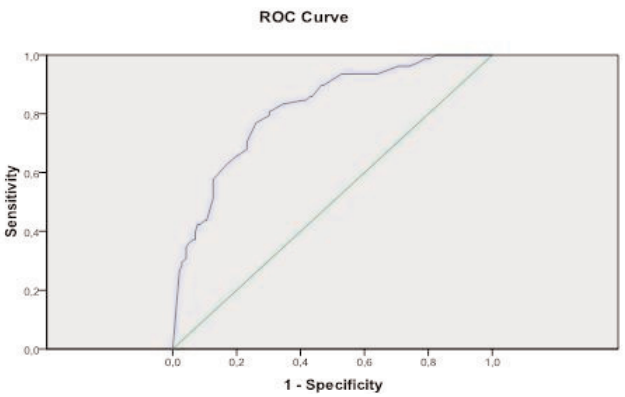


Figure 1— Receiver operating characteristic curve for posturographic fall risk by fall history. Area under-the-curve: 0.818

Discussion

In this study, we demonstrated significant differences between fallers and non-fallers according to posturographic fall risk and the clinical balance test. Posturographic fall risk was also found to be associated with the clinical balance test in community-dwelling older adults. Moreover, the posturographic fall risk index demonstrated good discriminative ability between fallers and non-fallers in the elderly.

Fall risk for community-dwelling older adults is an urgent, multifactorial, public health problem as incidence of falls and the aging population rises. More than one third of adults aged 65 or older sustain at least one fall each year (2,13). Similarly, the present study found that 35.5% our community dwelling participants had a history of falling, in accordance with previous reports.

It is important to determine whether the clinical assessment of balance can identify future fall risk. Many instruments have been developed to assess balance and predict falls in older adults; however, a standardized and valid screening instrument to identify elderly people at risk of falling is still not available (14). The BBS and the TUG were most rigorously studied and their reliability and validity for balance assessment had been established in community-dwelling older adults. Cross sectional and case controlled studies have shown that high scores on the TUG test are associated with an increased risk of falls (15,16). Furthermore, BBS has been shown to differentiate between faller and non-faller groups. With respect to the BBS, it has been reported that fallers had significantly lower scores than non-fallers (17,18). In accordance with these studies, we also demonstrated significantly lower BBS scores and higher TUG scores for fallers compared to non-fallers. In addition, a recent study has demonstrated that acceleration parameters were significantly correlated with BBS and TUG values (19). Similarly, we found a significant association between posturographic fall risk and clinical balance tests, including the BBS and TUG. Unlike our study, no significant correlation was found between scores on the posturographic fall risk index and BBS in another study (8). However, this study had small sample size and included older adults who had relatively good balance with a higher mean BBS value. This could be the reason that a significant correlation was not found in that study, which the authors also

Table 2— Discriminant Features of Posturography in Geriatric Patients according to History of Falling.

Cutoff Score	Sensitivity (%)	Specificity (%)	Youden Index	PPV	NPV	PLR	NLR
0	100	0.0	0.0	0.35	NA	1.00	NA
5	100	0.7	0.007	0.35	1.00	1.01	0.00
10	100	3.5	0.035	0.36	1.00	1.04	0.00
15	100	9.9	0.099	0.37	1.00	1.11	0.00
20	100	14.1	0.141	0.39	1.00	1.16	0.00
25	100	17.6	0.176	0.40	1.00	1.21	0.00
30	97.4	23.2	0.206	0.41	0.94	1.27	0.11
35	93.6	35.9	0.295	0.44	0.91	1.46	0.18
40	93.6	47.2	0.408	0.49	0.93	1.77	0.14
45	84.6	58.5	0.431	0.52	0.88	2.04	0.26
46	84.6	59.2	0.438	0.53	0.88	2.07	0.26
47	83.3	65.5	0.488	0.57	0.88	2.41	0.25
48	83.3	65.5	0.488	0.57	0.88	2.41	0.25
49	80.8	69.7	0.505	0.59	0.87	2.67	0.28
50	79.5	69.7	0.492	0.59	0.86	2.62	0.29
51	76.9	73.9	0.508	0.61	0.86	2.95	0.31
52	72.9	73.9	0.468	0.60	0.84	2.79	0.37
53	70.5	76.8	0.473	0.62	0.83	3.04	0.38
54	70.5	76.8	0.473	0.62	0.83	3.04	0.38
55	67.9	76.8	0.447	0.61	0.82	2.93	0.42
60	62.8	83.1	0.459	0.67	0.81	3.72	0.45
65	56.4	87.3	0.437	0.71	0.79	4.44	0.50
70	51.3	87.3	0.386	0.69	0.77	4.04	0.56
75	43.6	90.1	0.337	0.70	0.75	4.40	0.63
80	42.3	92.3	0.346	0.75	0.75	5.49	0.63
85	37.2	93.7	0.316	0.76	0.73	5.90	0.67
90	34.6	95.8	0.309	0.82	0.73	8.24	0.68
95	29.5	97.2	0.267	0.85	0.72	10.54	0.73
100	26.9	97.9	0.248	0.88	0.72	14.10	0.72

PPV: predictive-positive-value, NPV: predictive-negative-value, PLR: positive-likelihood-ratio, NLR: negative-likelihood-ratio, NA: not-applicable.

reported to be an unexpected result. On the other hand, in the same study it was concluded that a fall risk index measurement by posturography can identify individuals who have a high risk of falling, and that it seems to be a promising screening tool for the elderly (8).

No screening test is excellent, thus at present no screening test is known to be accurate enough to be regarded as a gold standard. Therefore, a good level of agreement between two tests, does not necessarily mean that prediction of falls will be accurate (4). Some studies have been conducted on risk factors for falls, and many factors related to future falls have been identified. The best predictors appear to be a history of falls and abnormalities of gait or balance (20). Among older adults, the strongest associations were reported for history of falls for all fallers (21). According to these findings, we used history of falls to categorize participants as fallers or non-fallers.

At present, recommending any single screening test for clinical practice is not possible. Poor balance is one of the major risk factors for falls among older adults (22). Furthermore, the force platform technique has been extensively used as a tool to assess balance (22). Force platform balance tests provide valid information about postural control that can be used to predict fall risk, even among older people without apparent balance problems or fall history (23). Only few studies have tested the sensitivity and specificity of posturog-

raphy techniques, let alone positive or negative predictive values (5). A systemic review, in which nine original prospective follow-up studies using the force platform as a tool to measure postural balance were included, aimed to determine whether posturography measurements can predict falls among elderly people (22). Associations between falls and certain sway parameters were found in only five of nine prospective studies. In this review it was concluded that certain aspects of force platform data may have predictive value for subsequent falls, especially various indicators of the lateral control of posture. However, the small number of studies available makes it difficult to draw definitive conclusions (22). In a recent study, it was suggested that the ability to control balance while standing with eyes open on a compliant surface, as a static posturographic finding, showed a high association with the fall history of older people (24). The role of the instrumented assessment of balance in clinical decisions has been recently reviewed and the contribution of center of pressure related measures in the detection of the risk of falling has been reported (25). Despite all these studies, the contribution of posturographic balance assessment to the prediction of falls remains unclear in the literature. On the other hand, our results demonstrated that posturography shows promising psychometric properties and good discriminant features for distinguishing fallers to non-fallers in community-dwelling elderly. In this preliminary study, the threshold established for posturographic fall risk index might identify individuals who should receive further comprehensive fall assessment and treatment to prevent falls.

A potential limitation of the present study is that data on fall frequency were collected retrospectively and were dependent on the subject's recall of the previous year. Moreover, the present study was performed only in a clinical setting, therefore the sample may not be representative of the general population of community-dwelling older adults because they were volunteers. Finally, further longitudinal prospective studies with larger sample sizes are needed to determine the predictive validity of posturographic measurements for detecting risk of falling in community-dwelling elderly in epidemiologic studies, because associations with fall history may not equate to predicting fall risk. After this preliminary study, we also planned prospective fall risk prediction of posturographic fall risk index for the cut-off value 51 established in this study.

In conclusion, it was shown that approximately one third of elderly participants fell at least once in the last year and that fallers had poorer balance, functional mobility, lower extremity neuromuscular function and quality of life compared to non-fallers. The study also exhibited that a posturographically obtained fall risk was positively correlated with clinical balance tests and afforded good discriminative ability in the identification of fallers.

Declaration of interest

We have no conflicts of interest.

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Turkish Journal of Geriatrics
2014; 17 (3) 249-255

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RESEARCH

A RETROSPECTIVE ANALYSIS OF 65 YEARS OLD AND OVER FORENSIC CASES WHO WERE ADMITTED TO THE EMERGENCY DEPARTMENT

ABSTRACT

Introduction: The objective of this study was to analyze the characteristics of geriatric forensic cases who were admitted to the Emergency Department and to investigate them from the forensic perspective in order to develop prevention programs.

Materials and Method: Patient charts, forensic reports and computerized patient records of geriatric forensic cases, who were admitted to our emergency department from 01.01.2008 to 30.06.2012, were investigated retrospectively.

Results: A total 143 forensic geriatric cases with a median age of 71.00±0.50 were included in the study. The most common incidents were traffic accidents (48.3%) and falls (26.6%). The mean time period for reaching the hospital was 109.2±237.3 minute; more than half (n=75) of the cases suffered head and neck injuries; no consultations from other departments were required for the majority of cases (70.6%), and 58% were discharged from the Emergency Department. Fractures (26.6%) and soft tissue injuries (24.5%) were the most common medical diagnoses; tendon cuts were not encountered in falls and traffic accident cases, and soft tissue injuries and intracranial hemorrhages were not encountered in penetrating injury cases. Intracranial hemorrhages were more common among fall cases, and soft tissue injuries were more common in traffic accident cases.

Conclusion: Our investigation revealed that traffic accidents and falls were the most common forensic cases among the geriatric age group. Educational initiatives and legal measures addressing the safety of elders, when seriously and determinedly conducted, will help to reduce injuries in the geriatric age group.

Key Words: Emergency Medical Services; Legal cases; Geriatrics; Wounds and Injuries.

ARAŞTIRMA

ACİL SERVİSE BAŞVURAN 65 YAŞ VE ÜZERİ ADLİ OLGULARIN RETROSPEKTİF ANALİZİ

ÖZ

Giriş: Bu çalışmanın amacı acil servise başvuran geriatrik adli olguların özelliklerini analiz etmek ve önleme programlarının geliştirilmesi için bu olguları adli açıdan araştırmaktır.

Gereç ve Yöntem: Acil servise 01.01.2008-30.06.2012 tarihleri arasında başvuran, 65 yaş ve üzerindeki adli olguların hasta kartları, adli raporları ve digital hasta kayıtları retrospektif olarak incelendi.

Bulgular: Yaş ortancası 71.00±0.50 olan 143 geriatrik adli olgu tespit edildi. En sık trafik kazası (%48.3) ve düşme (%26.6) olguları görüldü. Olguların ortalama 109.2±237.3-dakikada hastaneye ulaştıkları, yarıdan fazlasında (n=75) baş boyun yaralanması olduğu, çoğunda herhangi bir birimden konsültasyon (% 70.6) istenmediği ve %58'sinin acil servisten taburcu edildiği kaydedildi. Fraktür (%26.6) ve yumuşak doku travması (%24.5) en sık tanı olarak görüldü. Düşme ve trafik kazasında tendon kesisine, delici-kesici alet yaralanmasında ise yumuşak doku travması ve intrakranyal kanamaya rastlanmadı. İntrakranyal kanamanın düşme olgularında, yumuşak doku travmasının da trafik kazalarında daha sık görüldüğü tespit edildi.

Sonuç: Çalışma geriatrik yaş grubunda adli olgulara en sık trafik kazaları ve düşmenin neden olduğunu açığa çıkardı. Yaşlıların korunması için yapılacak eğitimsel girişimler ve yasal düzenlemeler, ciddiyet ve kararlılıkla devam ettiğinde geriatrik yaş grubunda yaralanmaların azaltılmasına yardımcı olacaktır.

Anahtar Sözcükler: Acil Servis; Geriatri; Adli Olgular; Travma.

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Geliş Tarihi: 13/03/2014
(Received)

Kabul Tarihi: 04/04/2014
(Accepted)

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Introduction

Elderly population represents an ever-increasing population in worldwide (1-3). As in most other countries of the world, in our country people 65 years old and over are classified as elderly (3-7). Improvements in healthcare have brought about a rise in life expectancy, but also a rise in the number of elderly patients. Turkish Statistical Institute publishes that 65 years and over citizens constitute 7.7% of Turkish population in 2013, meaning, the geriatric group keeps increases significantly when compared with previous years (5). This increase in the elderly population is expected to have a significant impact on public health issues all over the world.

The physiopathologic changes occurring in the geriatric age group like increase in chronic diseases frequency and motor and mental deterioration render this age group more vulnerable to physical traumas and cause more serious outcomes (6-8). The increase in the rate of complications affects therapeutic options, which in turn have a negative effect on mortality and morbidity rates. The Emergency Department (ED) is the common referral center for injuries; however, the epidemiologic trends of geriatric ED visits are not well known (6). Studies exploring the injury characteristics of the elderly would be valuable in defining priorities for further studies and for medical interventions. The above discussion led us to design a study to evaluate the demographics and other characteristics of geriatric forensic cases admitted to the ED of a tertiary-level hospital (9).

Materials and Method

This study has been approved by the Ethics Committee of Abant Izzet Baysal University with its decision numbered 2012/259 and dated 21.02.2013. Patient charts, forensic reports and computerized patient records of forensic cases, aged 65 and over, who were admitted to the emergency department from 01.01.2008 to 30.06.2012, were investigated retrospectively. This study included all forensic cases who were 65 years old and over, and applied to Abant Izzet Baysal University Hospital Emergency Service. The cases who were under the age of 65 years, and were not considered as forensic case were excluded.

Age and gender of the cases, type of the event, time of injury and time spent in reaching the hospital, site of injury, diagnosis, and admission and discharge data were evaluated.

The SPSS 19.0 (Windows SPSS Inc, Chicago, IL) program was used for statistical analysis. We used descriptive statistics to analyze the data. For demographic analyses, mean and standard deviation were used for data with normal distributions, and median and standard error were used for data with non-normal distributions. Student's t tests were used to compare continuous data, and chi-square tests were used to compare categorical data. Correlation analyses were conducted after significant chi-square tests for inter-group comparisons, and Kruskal-Wallis and Mann-Whitney tests were used for comparisons of times needed to reach the hospital. $p<0.05$ was accepted as statistically significant.

Results

The 2212 forensic cases admitted to the ED from 01.01.2008 to 30.06.2012 included 143 (6.4%) patients from the geriatric age group, with a median age of 71.0±0.5 years (95% CI 71.7-73.8 yrs). The median age of female cases (44.1%, n=63) was 73.0±0.8 yrs (95% CI 72.4-75.9 yrs), and the median age of male cases (55.9%, n=80) was 70.0±0.6 yrs (95% CI 70.4-73.0 yrs). Forensic geriatric admissions were greater in the months of July (n=29), October (n=20) and September (n=17). Fifty-nine cases (41.3%) were admitted in the summer months, 37 cases (25.9%) in the autumn months, 28 cases (19.6%) in the spring months and 19 cases (13.3%) were admitted in the winter months.

The time of the forensic event was 12:01-18:00 for most geriatric patients (49.0%, n=70), followed by 06:01-12:00 in 30 cases (21.0%), 18:01-24:00 in 27 cases (18.9%), and 00:01-06:00 in eight cases (5.6%). In eight cases (5.6%), the time of the injury was not recorded.

Type of event and the number of cases involved were as follows: traffic accident:48.3% (n=69) (42.0%, n=60 motor vehicle accidents; 6.3%, n=9 pedestrians); falls:26.6% (n=38); stab-cut injuries:8.4% (n=12); others:16.8% [six intoxications (all accidental), four assault and batteries, three burns, three hit by a falling object, three kicked by an animal, two suicide attempts (by taking pills), one stuck inside a door, one domestic assault victim, and one occupational injury].

Ninety-nine cases (69.2%) were transferred to the hospital by the 112 Emergency Service ambulances, and 44 cases (30.8%) were brought by private vehicles. The mean time interval from injury to admission to the hospital was 109.2±237.3 min (range: 10-1440 min). There was a statistically significant correlation between the event characteristic and the injury-to-admission period ($p=0.001$). Further analysis revealed that traffic accident cases (mean=83.5 min) were admitted to the hospital more rapidly than those in the "falls"

(mean=118.2 min) and "others" (mean=161.2 min) categories (p=0.002, p=0.001, respectively).

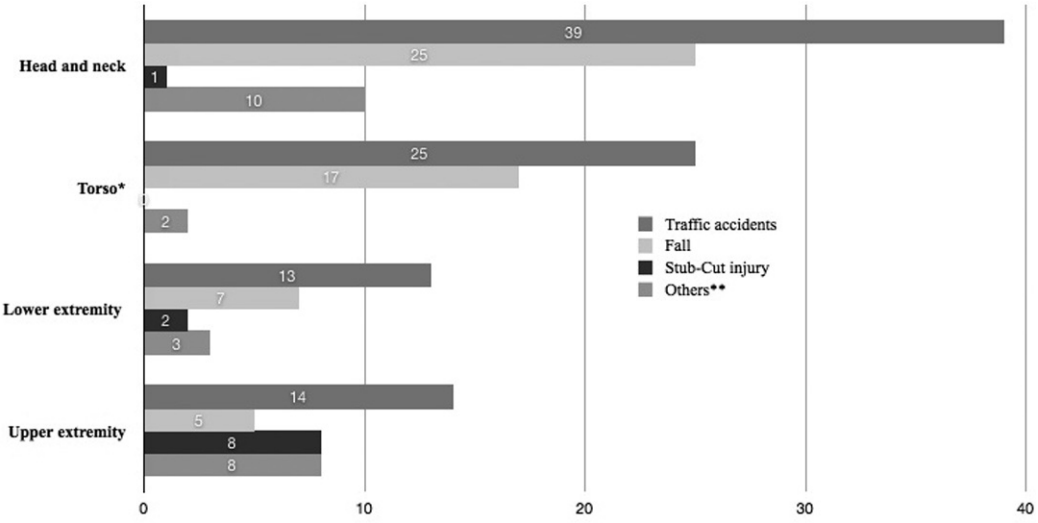
The sites of injury were as follows: head and neck in 75 cases (52.4%), torso in 44 cases (30.8%), upper extremities in 35 cases (24.5%), and lower extremities in 25 cases (17.5%). Twenty-four cases (16.7%) had injuries in both head and neck and torso regions, 13 cases (9.1%) had injuries in the head and neck and upper extremities, nine cases (6.3%) had injuries in the head and neck and lower extremities, 19 cases (13.2%) had injuries in the torso and extremities, and two cases (1.39%) had injuries in all body regions. Injuries in only one body region were most common in traffic accident cases (n=29); 74 cases had injuries in one body region, and the most commonly involved body regions were head and neck (n=32), followed by upper extremities (n=16), torso (n=10), and lower extremities (n=6).

When the correlation between the site of injury and the event characteristic was explored, it was found that there were no torso injuries in stab-cut incidents (Figure 1). There was a statistically significant difference between the fall cases with (26.1%, n=21) and without (11.9%, n=17) torso injuries (p=0.030). There were no significant differences between the fall cases with and without head and neck (p=0.087), upper extremity (p=0.077) and lower extremity (p=0.896) injuries.

There were consultation requests from various departments for 101 cases (70.6%). In these cases, 51 (50.5%) cases had one, 20 cases (19.8%) had two, and 30 cases (29.7%) had three or more consultation request orders. The most common consultation requests were those forwarded to the Orthopedic Clinic (37.8%, n=54). The second consultation request for those who already had an orthopedics consultation was forwarded to the Neurosurgery Department (55.6%, n=30), followed by the General Surgery Department (48.1%, n=26) (Figure 2). When correlation between the event characteristic and the number of consultation requests was explored, there was a significant difference between traffic accident cases (n=19, 63.3%) who had three or more consultation requests, and other event characteristics (n=11 36.7%; p=0.006).

Thirty-eight cases (26.6%) had bone fractures, 35 cases (24.5%) had soft tissue injuries, 30 cases (21.0%) had skin-mucosa cuts, nine cases (6.3%) had intracranial hemorrhages, seven cases (4.9%) had tendon cuts, and seven cases (4.9%) had hemopneumothorax (Table 1, Figure-3).

Eighty-three cases (58.0%) were discharged from the ED after the observation period, 50 cases (35.0%) were hospitalized in one of the clinics, five cases (3.5%) were transferred to another health center, four cases (2.8%) refused treatment and one case (0.7%) passed away. Of the cases transferred to other



* Torso: front and back, pelvis and perineum

**Others: Six intoxications (all accidental), four assault and batteries, three burns, three hit by a falling object, three kicked by an animal, two suicide attempts (taking pills), one stuck inside a door, and one domestic assault victim, one occupational injury

Figure 1

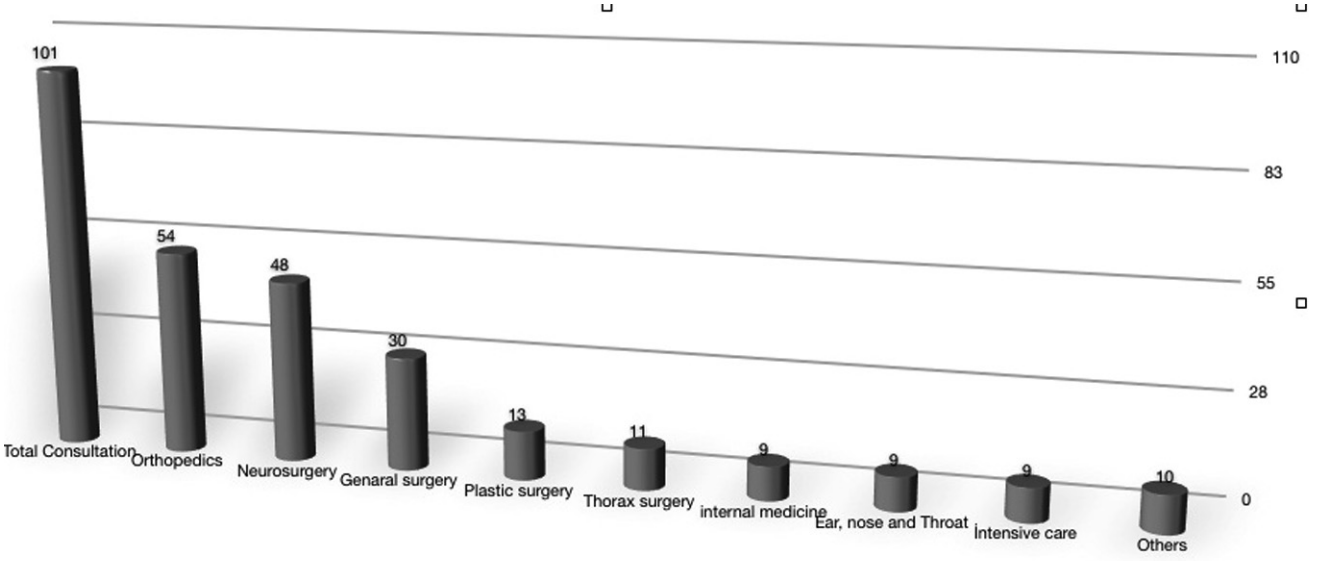


Figure 2

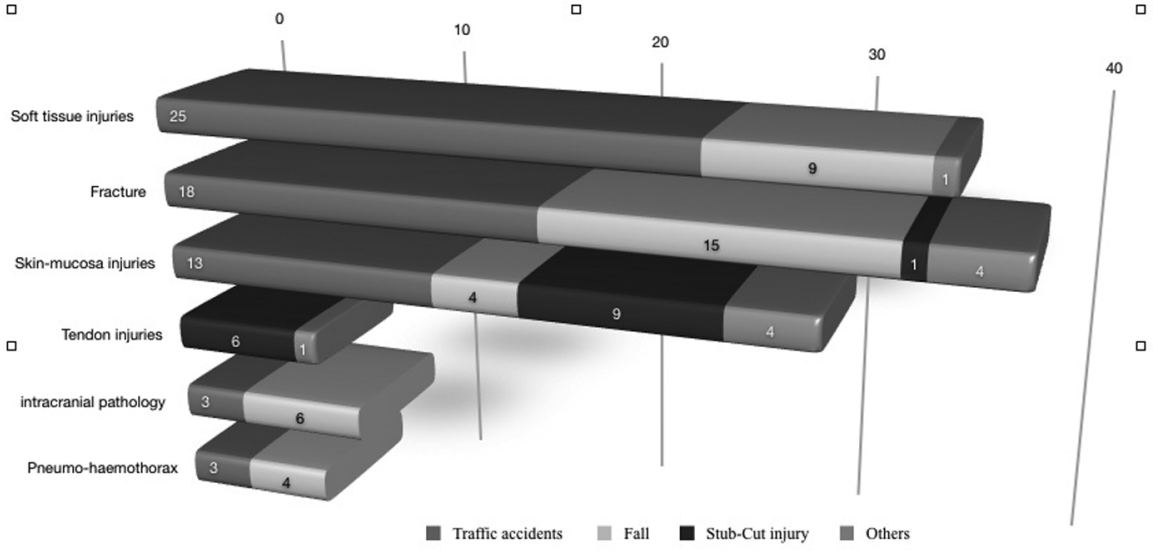


Figure 2

departments, 11.9% (n=17) were transferred to the Orthopedic Department, 7.7% (n=11) to the Neurosurgery Department, 4.9% (n=7) to the Intensive Care Unit, and 10.5% (n=15) were hospitalized in other departments. The greatest numbers of hospitalized patients were traffic accident cases; there was no significant difference between the event characteristic and hospitalization (p=0.901) (Table 2).

Discussion

People aged 65 and over are considered as geriatric (10,11). With advancing age, social activities decrease and so does the time spent outdoors. Thus the geriatric population is less exposed to trauma, be it forensic or not. On the other hand, the relative increase in the elderly in a given population and their more active involvement in everyday activities, plus the

Table 1— Injury Sites By Gender in The Geriatric Forensic Cases.

Injury Sites	Woman		Man		Total		p
	n	%	n	%	n	%	
Soft tissue injury	44	42.3	60	57.7	104	100	0. 326
Fracture	18	47.4	20	52.6	38	100	0. 375
Skin-mucosa injury	11	36.7	19	63.3	30	100	0. 246
Intracranial pathology	5	55.6	4	44.4	9	100	0. 348
Tendon injury	3	42.9	4	57.1	7	100	0. 635
Pneumo-haemothorax	1	14.3	6	85.7	7	100	0. 107

Table 2— Hospitalization Status of Forensic Cases.

Type of Event	Hospitalized Cases		Discharged Cases From The ED**		Total	
	n	%	n	%	n	%
Traffic accidents	23	33.3	46	66.7	69	100.0
Fall	13	34.2	25	65.8	38	100.0
Stab-Cut injury	4	33.3	8	66.7	12	100.0
Others*	10	41.7	14	58.3	24	100.0
Total	50	35.0	93	65.0	143	100.0

X2 p=0.901

*Others: Six intoxications, 4 assault and batteries, 3 burns, 3 hit by a falling object, 3 kicked by an animal, 2 suicide attempts, 1 stuck inside a door, 1 domestic assault victim, 1 occupational injury

**ED: Emergency Department

normal physiological changes of old age which slow down the reflexes and decrease overall body strength and sensory functions like hearing and seeing, make elders vulnerable to trauma (3,12). Study on forensic cases has reported that the elderly population is less involved in forensic cases than other age groups (13). The rates of geriatric patients were 6.2% in a study of 842 cases, and 5.4% in a study of 12823 cases, which are all compatible with our finding of 6.4% of geriatric cases in a total of 2212 forensic cases (8,14).

The mean age of geriatric forensic and wounded cases was reported as 81.50 years (n=276) in Labib et al.'s study, 69.80 years (n=52) in Gunduz et al.'s study (3,8). In our study, the median age of forensic geriatric cases was 71 years (females: 73 yrs, n=63; males: 71 yrs, n=80), and is quite close to the above findings. Our national culture where women are more sedentary and are mostly housewives may have been reflected in the above findings (15). Holbrook and Hoyt report that each year over one million women are hospitalized due to various traumas, and those women are more vulnerable to traumas than men (16). The rate of women was 57.8% in a study conducted in Tokyo with trauma cases, 50.6% in a study conducted in our country with forensic cases, and again constituted the majority in another study where blunt traumas were investigated in geriatric cases (6,9,17). The reason for women constituting the majority in studies investigating traumas is not clear, but gender-related physical differences, especially osteoporosis, might provide an explanation. However, there are other studies of forensic cases where men are in the majority (51.3%, 58.2%, 59.6%) and also trauma series with a prodominance of men (69.2%), reflecting our findings (8,14,18). Our study included only forensic cases. Men's more active social life may account for their predominance in our study.

There are studies in the medical literature which report that geriatric forensic cases and traumas of the elderly are seen most frequently beyond the winter months, and are especially prevalent in July and May (14,18,19). A decrease in trauma and forensic cases during the winter months is a natural consequence of social life reaching a minimum during the winter. Our findings are compatible with the relevant literature, with maximum ED admissions in summer and autumn months, and minimum in winter months.

All over the world a great number of injuries, which cause morbidity and mortality, are brought about by traffic accidents. In a study with non-traumatic forensic cases, it was reported that 38.7% of the cases reached a hospital in 30-120 min, and 50.9% of the cases were transported to the hospital by private vehicles; another study investigating traffic accident cases admitted to the ED observed that 41% of the cases reached the hospital in 0-2 hours (20,21). A study on geriatric trauma cases reported that 79.5% of their cases were transferred to the hospital by private vehicles (13). There are various studies that support the idea that for non-traumatic cases, their families and friends are preferred instead of an ambulance, due to the anxiety caused by the incident (20). Our forensic cases reached the ED in a mean time of 1.8 hrs, the earliest being 10 min, and 62.9% reached the hospital through the 112 Emergency Service system. In incidents like traffic accidents, which occur in public with many witnesses, it is usually easier to communicate with the Emergency Service, thus such cases can reach the hospital earlier and in an ambulance.

Various studies indicate that in the geriatric population (46%) as well as in all age groups, traffic accidents are the prominent event characteristic of all forensic events (6,14,21); however, some studies place falls in first place, with traffic accidents following as the 2nd most common forensic event (10,18). Most traffic accidents are motor vehicle accidents, with patients sitting inside the vehicle (41%), yet some study observed an increase in traffic accidents involving pedestrians (8). In our study, there were more motor vehicle accidents (42%) than accidents involving pedestrians. In addition, it is well known that in developing countries like ours, the traffic system has insufficient precautions designed for the security of pedestrians, like safer sidewalks and underground or overhead crossings.

Falls may cause significant injuries in the geriatric population (3). Studies report a high percentage of falls among forensic cases, especially in geriatric women, and involving low energy falls (10,18). In our study, falls (26.6%) were found to be second to traffic accidents as the event characteristic. The reduction in family size accompanying socioeconomic improvement, and the increase in the elderly population who actively participate in social life, have resulted in more people living by themselves. This is a significant point in evaluating geriatric cases, and an increase in fracture cases is to be expected, especially in falls, due to widespread osteoporosis in women. Since falls can be prevented and treated, both health personnel and the general population need to be educated on this issue.

The aging world population brings with it an increase in elder abuse and negligence (8,22). In a study including 454 geriatric cases, only one case was evaluated as elder abuse (17). Similarly, in our study, only one case was evaluated as physical elder abuse. A study conducted in Eskisehir revealed that 17 out of 19 injury cases, other than unintentional injury, were assaults by immediate family members or by relatives (8). Since the rate of elders living by themselves is rather low in our country, and since most are living with their children, it may be inferred that they are less exposed to elder abuse; however, it is also possible that abuse might have been overlooked due to inadequate or faulty information. It is known that elder abuse is usually practiced by close family members, or by caretakers or attendants in houses or in nursing homes (22). ED physicians need to be alerted in this regard and elder abuse should be included in differential diagnoses.

Some studies have reported that geriatric forensic cases or injuries have a mortality rate of 0.8-12%, and are usually (76.4-90.6%) discharged from the ED (6,9,17,20,21). The rate of hospitalization in geriatric forensic trauma cases can be expected to be higher due to the number of chronic diseases associated with old age. Hospitalization rate was found as 55.6%, 88.45%, 47%, 21.7% in some studies (8,9,17,20). The most common departments where geriatric forensic patients were hospitalized are Orthopedics, Neurosurgery and Intensive Care Units (8,9,18,21). The findings of our study are compatible with the relevant literature, with hospitalization in Orthopedics being the most common (11.9%), followed by Neurosurgery (7.7%).

It should be kept in mind that normal physiologic changes of the aged will facilitate injuries, especially bone fractures. Bone fractures are common among forensic cases, and the Turkish Penal Code evaluates them as injuries "not relieved by simple medical intervention." Bone fractures are a common consequence of traffic accidents, followed in frequency by other traumas like falls and assault and battery (8-9,13). In our study, 48% of the fracture cases were from traffic accidents. Traffic accidents were in first place among event characteristics, which may account for why the most bone fractures were seen in traffic accidents.

Various studies affirm that head and neck injuries are common in geriatric trauma cases (8,17). In multiple injuries, head and neck is the most commonly affected (44.2%) body region, followed by the extremities (26.9%); a study investigating traffic accident injuries also indicated the head and neck region as the most affected site (18.6%), followed by multiple injuries of head and neck and extremities (14.5%) (17,18,21). Atilla et al., in their study of low-energy traumas where 96% of the cases fell on smooth surfaces, found that the

most commonly affected body regions were the extremities (17). Twenty-four cases (16.7%) in our series had head and neck plus torso injuries, followed in frequency by head and neck plus extremity injuries, and our findings are compatible with the relevant literature.

In conclusion, in line with the expected growth of the geriatric population, forensic geriatric visits to the ED will continue to increase. Our study observed that forensic cases in the geriatric population were predominantly due to traumas resulting from accidents, mostly traffic accidents and falls. Morbidity of such cases has a greater economic and social impact than mortality. Thus, prevention measures at home and outdoors, considering the physical capacities of the elderly, need to be taken. Enforcement of traffic rules is a must, and preventing the aged from living unattended, providing caretakers or increasing the number and quality of nursing homes will be helpful. Even simple measures to that end will help to decrease age-related injuries.

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Turkish Journal of Geriatrics
2014; 17 (3) 256-261

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Geliş Tarihi: 29/05/2014
(Received)

Kabul Tarihi: 20/08/2014
(Accepted)

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RESEARCH

THE EFFECT OF AGITATION ON CAREGIVERS' BURDEN IN PATIENTS WITH DEMENTIA

ABSTRACT

Introduction: The purpose of this study was to examine the effect of agitation on caregiver relatives' subjective burden together with other possible factors such as depressive symptoms, cognitive functions, duration of dementia, and caregivers' age, education and gender.

Materials and Method: The participants were 49 patients with dementia (mean age: 76.5; SD: 5.6) and their caregivers. Standardized Mini Mental Test and Cornell Scale for Depression in Dementia were administered to the patient. Cohen-Mansfield Agitation Inventory, Informant Questionnaire of Cognitive Decline in the Elderly and Zarit Burden Scale were administered to the caregivers. Linear regression analysis was used to examine the effects of the variables on caregiver burden.

Results: There was neither a significant difference between gender and type of caregiver in terms of Zarit Burden Scale points, nor a significant correlation between Zarit Burden Scale scores and Standardized Mini Mental Test, Cornell Scale for Depression in Dementia, age and education of the patient, education of the caregiver or duration of dementia. Significant correlations between Zarit Burden Scale scores and caregivers' age, Informant Questionnaire of Cognitive Decline in the Elderly and Cohen-Mansfield Agitation Inventory scores were found. Linear regression analysis showed a relationship only between agitation and caregiver burden.

Conclusion: Patients' agitation frequency which was assessed by Cohen-Mansfield Agitation Inventory was the basic factor in determining subjective caregiving. In addition to psychopharmacological treatment, psychosocial interventions for caregivers are effective. In our country, daycare and homecare services, as well as supportive and educative psychosocial programs including interventions for agitation, should be improved.

Key Words: Dementia; Caregivers; Psychomotor Agitation.

ARAŞTIRMA

DEMANS HASTALARINDA AJİTASYONUN BAKIM VEREN YÜKÜNE ETKİSİ

ÖZ

Giriş: Bu çalışmanın amacı demans hastalarına bakım veren yakınlarında ajitasyonun öznel bakım veren yüküne etkisinin depresif belirtiler, bilişsel işlevler, demans süresi, bakım verenin yaşı, eğitimi, cinsiyeti gibi diğer etmenlerle birlikte araştırılmasıdır.

Gereç ve Yöntem: Araştırmaya toplam 49 demans hastası (Ort. yaş: 76.5; Ss: 5.6) ve 49 bakım vereni katılmıştır. Verilerin toplanmasında, hastalara Standardize Mini Mental Test ve Cornell Demansta Depresyon Ölçeği, bakım verenlere ise Cohen-Mansfield Ajitasyon Envanteri, Bilişsel Kayıp için Bilgilendiriciye Uygulanan Anket ve Zarit Bakıcı Yükü Ölçeği uygulanmıştır.

Bulgular: Bakım verenin cinsiyeti ve yakınlık türü ile Zarit Bakıcı Yükü Ölçeği puanları açısından istatistiksel olarak anlamlı fark bulunmadığı gibi Standardize Mini Mental Test ve Cornell Demansta Depresyon Ölçeği puanları, bakım verenin eğitim süresi, hastanın yaşı, eğitim süresi ve hastalık süresi ile de anlamlı korelasyon bulunmamıştır. Zarit Bakıcı Yükü Ölçeği ile Cohen-Mansfield Ajitasyon Envanteri puanı, bakım veren yaşı ve Bilişsel Kayıp için Bilgilendiriciye Uygulanan Anket puanı arasında anlamlı korelasyon saptanmıştır. Lineer regresyon analizinde ise bakıcı yükünün yalnızca ajitasyon puanı ile ilişkili olduğu bulunmuştur.

Sonuç: Bu çalışmada elde edilen sonuçlar demans hastalarında Cohen-Mansfield Ajitasyon Envanteri ile değerlendirilen ajitasyon sıklığının öznel bakım veren yükünü belirleyen temel faktör olduğuna işaret etmektedir. Bakım verme işinin kolaylaştırılması için psikofarmakolojik tedavilerin yanı sıra bakım verenlere yönelik psikososyal girişimler de etkili olmaktadır. Ülkemizde ajitasyona yönelik müdahaleler içeren evde ve gündüz bakım hizmetlerinin, bakım verenlere yönelik psikososyal destek ve bilgilendirme programlarının yaygınlaştırılması gereklidir.

Anahtar Sözcükler: Demans; Bakım Verenler; Psikomotor Ajitasyon.

Introduction

Dementia is a syndrome characterized by progressive deterioration in many cognitive functions, such as praxia, gnosia, visual-spatial and executive functions, and in daily living activities. As well as the cognitive symptoms, a variety of neuropsychiatric symptoms such as depression, anxiety, delusions, hallucinations, changes in sleep and appetite patterns and agitation appear in the course of dementia. Patients with dementia need long term care as a consequence of these symptoms. These three symptom clusters have been presented as the most important factors associated with caregiver burden (1).

Caregiver burden is a concept which describes physical, emotional and financial consequences of care giving. Two types of caregiver burden have been identified: subjective and objective. Subjective burden is a state that can be described by caregivers and assessed with various inventories. This concept involves the behavioral and emotional reactions of a person to the caregiving experience. On the other hand, objective burden is based on objective criteria such as the time and money spent on caregiving. Subjective caregiver burden is thought to be especially important in the maintenance of successful rehabilitation and care (2). Since neuropsychiatric symptoms are treatable, it is important to manage them in order to decrease caregiver burden. Neuropsychiatric symptoms seen in patients with dementia were found to be the main predictors of the caregiver burden in some studies (1, 3). Among the neuropsychiatric symptoms, agitation was reported to be the most important cause of caregiver burden (4).

Furthermore, some studies have found that caregiver burden decreases if the agitation is treated (5). Additionally, the clinical course of dementia and nursing home placement can be affected by caregiver burden (6). Results of previous studies suggest that caregiver burden and/or stress/burnout experienced by caregivers can differ according to culture (3). Despite the paucity of statistical data, it would appear that most patients with dementia are given care at home by their relatives because of the traditional family structure in our country, which has low nursing home placement rates (7).

Caregiver burden and burnout levels of caregivers of dementia patients have been investigated in previous studies in Turkey. One of these studies founded that anxiety level, phobias and duration of care were correlated with the burden of caregivers of Alzheimer patients (n=23) (8).

There has been no published research in our country about the effect of agitation on caregiver burden for dementia patients. Therefore, this study aimed to investigate the effect of agitation on caregiver burden, along with other possible causes of burden such as depressive symptoms, cognitive functions, duration and severity of dementia and socio-demographic data of the caregivers.

Materials and Method

Study Sample

The study sample consisted of 49 patients who were diagnosed with dementia according to the Diagnostic and Statistical Manual of Mental Disorders-Text Revised Edition (DSM-IV-TR) criteria, and their caregivers (9). Patients who did not have a caregiver or refused to participate in the study were excluded. Caregivers who had not known the patients for at least 10 years were also excluded from the study. The present study was approved by the ethics committee of Ankara University and signed informed consents were taken from the caregivers. The Standardized Mini Mental Test (SMMT) and the Cornell Scale for Depression in Dementia (CSDD) were administered to the patients. The Cohen-Mansfield Agitation Inventory (CMAI), The Informant Questionnaire of Cognitive Decline in the Elderly (IQ-CODE), Functional Activities Questionnaire (FAQ) and the Zarit Burden Scale (ZBS) were administered to the caregivers. Details of these instruments are described below.

The Standardized Mini Mental Test (SMMT) consists of 30 items that evaluate cognitive functions such as orientation, registration, recall, attention, calculation and language. Lower scores indicate cognitive deterioration. It is widely used because of its short application time. The Turkish form of the SMMT has been shown to be valid and reliable by Gungen et al. (10).

The Cornell Scale for Depression in Dementia (CSDD) was specifically developed to assess major depression in patients with dementia. It is completed by the clinician via interviews with patients and their caregivers. Five subgroups (mood related signs, behavioral disturbances, physical findings, cyclic functions, ideational disturbances) are assessed on 19 items. Each item is scored between 0 and 2. Scores above 7 are highly suggestive for depression. The Turkish adaptation of the CSSD was developed by Amuk et al. (11).

The Informant Questionnaire of Cognitive Decline in the Elderly (IQ-CODE) consists of 26 items and is useful for evaluation of disturbances in cognitive functions and daily living activities. It is completed by the patient's caregiver. Informants are asked to rate the degree of change over the previous 10 years in 39 aspects of everyday cognitive functioning.

Therefore, "caregiver must have known the patient for at least for 10 years" was accepted as an inclusion criterion. A validity and reliability study of the Turkish version of the IQ-CODE was carried out by Ozel-Kizil et al. (12). The IQ-CODE score equals the sum of the items divided by the number of items. IQCODE scores above 3.4 were found to be predictive of dementia in the adaptation study for the Turkish version (12).

The Functional Activities Questionnaire (FAQ) assesses independence in daily activities and is a widely used screening tool for dementia. It is completed by the administrator via an interview with the patient's caregiver. The total score is the sum of the individual item scores; higher scores reflect greater dependency. Total scores range from 0-30. The adaptation study of the Turkish form of the scale was carried out by Selekler et al. (13).

The Cohen-Mansfield Agitation Inventory (CMAI) consists of 29 items. It is a seven- point rating scale (1-never and 7- several times an hour) which assesses the frequency of agitation behaviors. It should be completed by a rater during an interview with the caregiver. The total score (29-203) is the sum of individual item scores; higher scores reflect more severe agitation. An adaptation study of the Turkish form of the CMAI was carried out by Ozel-Kizil et al. (14).

The Zarit Burden Scale (ZBS) was developed by Zarit, Reever and Bach-Peterson in 1980 to assess difficulties experienced by caregivers. It uses a five-point Likert scale (never, rarely, sometimes, quite frequently, nearly always) consisting of 22 items and is completed by caregivers. Higher scores reflect more severe burden (15). Two different Turkish adaptation studies have been conducted with this scale. The first was performed by Inci and Erdem (2008) and involved 220 caregivers of elderly people. Internal consistency correlations for the scale were reported as 0.95 and inter-item correlation values were moderate, strong and very strong (between 0.43 and 0.85). The test-retest consistency coefficient was 0.90. Factor analysis yielded only one factor, which explained 53.6% of the total variance (16). The latter study involved 100 caregivers of patients with schizophrenia and was carried out by Ozlu et al. In this study, factor analysis yielded five factors, explaining 61% of the total variance. These factors were "mental irritability and subjective deterioration of living" (items: 2, 3, 10, 11, 12, 17, 19), "nervousness and feeling restricted" (items: 5, 9, 22), "deterioration in social relationships" (items: 6, 13, 18), "economic burden" (items: 15, 20, 21, 7) and "dependency" (items 8, 14). Items 1, 4 and 16 were not included in any factor because of their low factor loadings (17).

Table 1— Sociodemographic Features of The Patients and The Caregivers

	Patients With Dementia (n=49)	Caregivers (n=49)
Age (mean and SD)	76.5±5.6	53±12
Total years of education (mean and SD)	4.7±3.6	8.9±4.7
Gender (F/M)	24/25	36/13

Data Analysis

An independent samples t-test was used to compare ZBS scores of males and females. Pearson correlation tests were used to assess the correlations between ZBS scores and other variables (CMAI scores, age, education of the patient and the caregiver, estimated dementia duration, other scale scores, etc.) In addition, the relationships between factors of the ZBS and CMAI total scores were assessed using Pearson correlation tests. Linear regression analysis was used to evaluate the effects of factors that significantly correlated with ZBS on caregiver burden. All statistical analyses were performed using SPSS 17.0.

RESULTS

Socio-demographic characteristics of the patients and their caregivers are presented in Table 1. 75.5% (n=37) of caregivers were children and 24.5% (n=12) were spouses of the patients. 71.4% (n=35) of patients were diagnosed with dementia due to Alzheimer's disease. The other diagnoses were: mixed type dementia (n=10, 20.4%), vascular dementia (n=2, 4.1%) and other dementia (n=2, 4%). More than half of the patients had agitation behaviors such as "repetitive sentences and questions", "negativism" and "general restlessness". "Biting" was not reported for any of the patients.

Mean scores of the scales which were applied to the patients and caregivers are given in Tables 2 and 3. There were no statistically significant differences between male and female or spouse and child caregivers in terms of ZBS total scores

Table 2— Mean and Standard Deviations of The Scale Scores Applied to The Patients.

	Patients With Dementia (n=49)
SMMT total score	14.7± 6.7
CSDD total score	6.8±6.4

Table 3— Mean and Standard Deviations of The Scale Scores Applied to The Caregivers.

	Caregivers (n=49)
IQCODE total score	4.1±0.7
CMAI total score	57.5±27.3
FAQ total score	17.1±11.2
ZBS total score	38.8±21.3

(t=1.29, p=0.20; t=1.38, p=0.17, respectively). Significant correlations were found between ZBS total scores and the age of the caregiver (r=-0.42, p=0.004), CMAI scores (r=0.692, p<0.001), and IQ-CODE scores (r=0.34, p=0.02). There were no significant correlations between ZBS scores and SMMT scores, CSDD scores, caregiver's education (total years), age of the patient, patient's education (total years) or duration of the illness (p>0.05).

According to the linear regression analysis (b=0.559, SE=0.085, ,=0.692, t=6.576, p<0.001), ZBS total scores were associated with CMAI total scores. Age of the caregiver and the IQ-Code scores did not enter the model.

There were significant positive correlations between CMAI total scores and "mental irritability and subjective deterioration of the living", "nervousness and feeling restricted", "deterioration in social relationships", and "economic burden" factors (r=0.59, p < 0.001; r=0.67, p< 0.001; r=0.58, p<0.001; r=0.61, p<0.001, respectively). No significant correlation was found between CMAI total scores and the "dependency" factor (r=0.23, p=0.12).

Discussion

Results of the present study show that agitation frequency which was assessed by the CMAI in dementia patients is the main factor that affects caregiver burden. Agitation was correlated with all of the sub-components of caregiver burden except dependency. Functional and cognitive status, depressive symptoms, age and gender of the patient, education of the caregiver, duration of the care and the relation of the caregiver to the patient were not found to be associated with caregiver burden. These results are consistent with the results of previous studies that have been carried out in different countries. Victoroff et al. indicated that caregiver burden in patients with dementia was associated with agitation but not with delusions, hallucinations or depressive symptoms (4). A study from China that assessed patients with dementia using the Neuropsychiatric Inventory and their caregivers using the ZBS also found that caregiver burden was mainly associated with apathy and agitation (18). Follow-up studies performed in recent years yielded similar results. For instance, a multicenter study from Spain, which included 1235 moderate to severe patients with Alzheimer's Disease, indicated that although functional and cognitive status deteriorated significantly at the end of a twelve-month period, caregiver burden decreased with decreased behavioral disturbances (19). A three-year follow-up study from the USA that included 5831 primary caregivers of dementia patients found that 43.9% of the patients were placed in nursing homes, and behavioral disturbance/agitation (aggression, damage to property, repetitive questions and living in the past) was mainly associated with nursing home placement (20).

Although there are a few studies concerning caregiver burden and dementia in our country, interpretation of their results is difficult due to different methodologies. Akyar and Akdemir (21) investigated the difficulties experienced by caregivers of patients with Alzheimer's Disease (n=50) and indicated that wandering and fecal incontinence were related to the problems of care. Yilmaz et al. (22) found that depressive symptoms and functional status were related to burnout in caregivers of these patients (n=44). Therefore, the present study can be accepted as the first study in Turkey that investigated the effect of agitation on caregiver burden, together with other factors, in a detailed manner.

Daily functioning of the patients which was assessed by FAQ scores seem to be in a wide range in the present study and functional status was not related to caregiver burden. This result may be due to the heterogeneity of the sample in terms of dementia etiology. Therefore, another study consisting of only patients with Alzheimer's Disease would give different results in terms of the relation between functional status and caregiver burden.

A study by Cohen-Mansfield, which included dementia patients in nursing homes (n=191), showed that non-aggressive verbal agitation (repetitive sentences and questions, complaining, etc.) was the most frequent behaviour and most disruptive behaviour for the caregivers. However, when the frequency of this behavior was used as a covariate, physically aggressive behaviours were found to be the most disruptive ones (23). In the present study "repetitive sentences and questions" and "complaining" were also found to be the most frequent agitation behaviours in patients with dementia.

Another result of the present study is that the caregiver's gender had no effect on caregiver burden. This issue is controversial. Some of the previous studies pointed out that burden

is higher in female caregivers, and other studies have found no difference in terms of gender. A study by Akpinar et al. (24) compared caregiver burden in males and females and found a higher burden in females. This result was explained by the assumption that females were more likely to express their emotional status than males. On the other hand, Yilmaz et al. (22) found no gender difference in terms of caregiver burden. In our study, most of the caregivers were middle-aged women. In previous studies carried out in Turkey, most of the caregivers of patients with dementia were also female (22, 25). The Turkish validity and reliability study of the Caregiver Burden Inventory included 240 caregivers of patients with dementia and most of them were also female (mean age 53.88 ± 13.31, 78.3% females, 48.7% were daughters of the patients) (25). These results are parallel to those found in other countries and emphasize that caregiving is mostly carried out by females. Therefore, caregiving issues in females should be taken into account with regard to preventive psychiatric services.

Although it did not enter the final model, there was a negative correlation between the age of the caregiver and the caregiver burden. This result suggests that young caregivers are more in need of maintaining their social interactions and occupations, so burden in the social domain is higher. In the present study, the increase in burden with decreasing age may also be associated with less adequate coping skills of younger people.

Additionally, it is interesting that while no associations were found between objective cognitive performances and caregiver burden, a significant correlation was found between subjective informant ratings of cognitive status evaluated by the caregiver on the IQ-CODE, and caregiver burden. This result is important with regard to the difference between objective cognitive disturbance of the patient and the perception of the caregiver. Caregivers of patients with dementia deal not only with the treatment of their patients but also with neuropsychiatric manifestations that appear as the dementia progresses. Progressive disability, gradual increase in dependency of the patient on the caregiver, and receiving no positive feedback to restore hope are the most disturbing factors for caregivers (3). Treatment in dementia is mostly symptomatic and aims to increase the quality of life of the patient and support their care. Therefore, agitation behaviors which are frequently encountered in dementia patients and are disruptive for caregivers should be taken into account in the treatment process.

As well as psychopharmacological treatments for the patients, psychosocial interventions for the caregivers are also recommended. When the difficulty of the caregiving process is taken into account, multidimensional interventions such as psychoeducation, support groups, relaxation techniques, etc. were reported to be more effective than unidimensional treatment options.

Overall, the results of this study suggest that daily care and care at home services should be enhanced and extended in our country, and psychosocial support and information programs for caregivers should be improved.

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Turkish Journal of Geriatrics
2014; 17 (3) 262-271

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RESEARCH

DO PILATES AND YOGA AFFECT QUALITY OF LIFE AND PHYSICAL PERFORMANCE OF ELDERLY LIVING IN A NURSING HOME A PRELIMINARY STUDY

ABSTRACT

Introduction: This study investigated whether Pilates and yoga affect quality of life and physical performance of elderly living in a nursing home.

Materials and Methods: Out of 58 elderly living in a nursing home, 36 subjects were randomized to Pilates or yoga groups and 22 subjects served as a control group. Study subjects attended three classes per week for 8 weeks. Health-related quality of life and physical fitness were assessed before, immediately after and 6 months after training.

Results: Nottingham Health Profile total scores were significantly different among all groups (p=0.007). Sleep (p=0.026) and emotional reaction subscores (p=0.037) decreased in both intervention groups. Hand grip strength (p=0.017) and sit and reach test scores (p=0.019) were improved immediately after yoga. However, none of these effects persisted after 6 months.

Conclusion: Yoga improved sleep quality, strength and flexibility in seniors living in a nursing home only immediately after training, in this preliminary study with a small sample size. No improvements were observed in the investigated parameters 6 months later.

Key Words: Aged; Exercise; Nursing Homes; Yoga.

ARAŞTIRMA

HUZUREVİNDE YAŞAYAN YAŞLILARDA PİLATES VE YOGA YAŞAM KALİTESİNİ VE FİZİKSEL PERFORMANSI ETKİLİYOR MU? ÖN ÇALIŞMA

ÖZ

Giriş: Bu çalışmada huzurevinde yaşayan yaşlılarda Pilates ve yoganın, yaşam kalitesi ve fiziksel performansı etkileyip etkilemediği incelenmiştir.

Gereç ve Yöntem: Huzurevinde yaşayan 58 yaşlıdan 36'sı Pilates ve yoga gruplarına rast gele dağıtıldı ve 22'si de kontrol grubu olarak çalışmaya alındı. Çalışma grubundaki kişiler, haftada 3 gün 8 hafta süre ile egzersiz eğitimine alındı. Egzersiz eğitimi öncesi, eğitimden hemen sonra ve 6 ay sonra; sağlıkla ilişkili yaşam kalitesi ve fiziksel zindelik değerlendirildi.

Bulgular: Üç grup arasında Nottingham Sağlık Profili toplam puan farkı anlamlı farklı idi (p=0.007). Her iki egzersiz grubunda uyku (p=0.026) ve emosyonel reaksiyon (p=0.037) altskorları azaldı. Yoga grubunda el kavrama kuvveti (p=0.017) ve otur-uzan test puanları (p=0.019) eğitimden hemen sonra artış gösterdi. Ancak bu etkilerin hiçbirisinin 6 ay sonra devam etmediği görüldü.

Sonuç: Bu ön çalışmada; yoga huzurevinde yaşayan kısıtlı sayıda yaşlıda, sadece eğitimden hemen sonra uyku kalitesi, kuvvet ve esnekliği geliştirmiştir. 6 ay sonra incelenen parametrelerde değişiklik olmadığı görülmüştür.

Anahtar Sözcükler: Yaşlı; Egzersiz; Huzurevi; Yoga.

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Geliş Tarihi: 14/03/2014
(Received)

Kabul Tarihi: 06/07/2014
(Accepted)

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Introduction

Mind-body exercise interventions have become increasingly popular in the management of various medical conditions over the last decades. Chronic low back pain, depression, cancer, cardiopulmonary disorders, multiple sclerosis and stroke are among the disorders investigated (1-5). The evidence supporting the benefits of these interventions on health status is growing.

Mind-body exercise interventions are also addressed in geriatric populations. Yoga, Pilates, tai chi chuan and qi gong are reported to be safe and feasible mind-body interventions for the elderly (1, 6, 7).

Yoga is a movement-based philosophy that involves gentle stretching, postural training, breath control and meditation (4). Literature is accumulating about different types of yoga with seniors. Laughter yoga for depression and late life satisfaction (2), silver yoga for sleep disturbances (3) and Iyengar yoga for chronic obstructive lung disease (8) are some examples. These are modified types of hatha yoga, consisting of posture and breathing exercises.

Improvements in quality of life and mood after yoga practice in elderly people have shown promise in a limited number of studies (8-10). The long-term effects of yoga on elderly persons living in nursing homes should also be evaluated.

Pilates is an exercise system developed by Joseph Pilates during the 1st World War (11). Pilates developed his method after studying yoga, Zen, ancient Greek exercise regimes, gymnastics and dance, and it is also called "contrology" (12). Pilates emphasizes core strengthening, flexibility, postural awareness and breathing. Focus on breathing and concentration during the exercises comprises the mental component. Pilates is recommended in the management of chronic low back pain, fibromyalgia and cancer pain (1, 13, 14). Few studies have investigated the effects of Pilates on the elderly (7, 15).

Our aim was to investigate whether Pilates and yoga affect quality of life and physical performance of elderly subjects living in a nursing home.

Methods

This prospective controlled study was approved by the Gazi University Research Ethics Committee (056/23.06.2010) and Administrative Board of Nursing and Care Facility. Informed consent was obtained from the participants. The study was conducted in the 75. Yıl Nursing and Care Facility. The medical staff of this institution includes a general practitioner, a physiotherapist, a social worker and nurses.

Residents were recruited via local announcements in the nursing home. All volunteers were enrolled into the study unless any contraindication to physical training was present. Exclusion criteria were unstable cardiopulmonary disease, joint instability, active joint inflammation, fracture or orthopedic surgery in the last 6 months, severe cognitive impairments (MMSE scores below 24) and inability to follow directions. None of the participants had engaged in yoga or Pilates before.

Subjects completed questionnaires that covered demographic characteristics and medical conditions. Before the study, physical activity level was assessed using the Turkish version of the International Physical Activity Questionnaire (IPAQ) short form (16). Physical activity level was categorized as low, intermediate or high. The Turkish version of the mini-mental state examination (MMSE) was performed (17). Higher MMSE scores show higher cognitive performance.

Assessments, including health-related quality of life and physical measures, were performed three times: at baseline, at the end, and 6 months after the training. Anthropometric measurements were assessed only before and immediately after the study.

To assess health-related quality of life, the Turkish version of Nottingham health profile (NHP) was used (18). It contains 38 items that address pain, physical mobility, emotional reactions, energy, social isolation, and sleep dimensions. Scores range from 0 to 100 and higher scores indicate worse quality of life. The geriatric pain measure (GPM) was performed for multidimensional pain assessment. The GPM consists of 24 items (19). Scores range from 0 to 100 (Scores <30; mild pain, 30-69; moderate pain, >70; severe pain). The Geriatric Depression Scale-Short Form (GDS), a 15-item questionnaire with scores ranging from 0 to 15, was also administered (20). A score higher than 5 is suggestive of depression.

The Physical Functioning Questionnaire (PFQ) was used to measure self-reported disability status (21). Scores range between 0 and 57. Higher scores show a higher disability level. Grip strength of the dominant hand was measured three times using a vigorimeter (Riester, Dynatest dynanometer, Jungingen, Germany). The best measurement of the three was used for analysis. Scores range between 0 and 1.0 bar. The Berg balance scale was used to measure balance ability, with scores ranging between 0 and 56 (22). Subjects with better balance ability attained higher scores. Functional capacity was measured using the Senior Fitness Test (23). This battery comprises 6 tests evaluating muscle strength and flexibility of the upper and lower body, and endurance. The individual tests are chair-stand, arm curl, chair sit-and-reach, back scratch, 8-foot up-and-go and 2-minute step tests.

Measures of body composition included body weight, height, body mass index (BMI), body fat percentage and fat free mass, measured using the body composition analyzer (Tanita BC-418 Segmental Body Composition Analyzer).

Thirty-six elderly subjects who volunteered for exercise training were randomized to Pilates or yoga intervention, using stratified randomization. Stratification was used to control the covariates of age and sex. 22 subjects who did not volunteer for exercise training constituted the control group. They were told to follow their usual daily activities. Figure 1 describes the flow of the participants in the study.

Subjects in the yoga and Pilates intervention groups attended three classes per week for 50 minutes per session, for 8 weeks. The protocols were developed collaboratively by the physiatrists and the certified yoga and Pilates instructors. The classes were directed by certified yoga and Pilates instructors under the supervision of one research physiatrist. The exercises were adjusted depending upon individual systemic and musculoskeletal conditions where needed.

Contents of the Pilates program are given in Table 1. The degree of difficulty and level of the exercises were modified according to the performance of the subjects. Exercises were performed on mats, and only exercise bands and free weights were used as equipment.

Contents of the yoga program are shown in Table 2. The degree of difficulty and duration of the asanas was increased gently according to the capacity of the subjects. Each week, an average of 7 poses was taught. Each pose was maintained for 4 seconds at the beginning of the training program and then increased to 12 seconds at the end. Props such as blankets and chairs were used when needed.

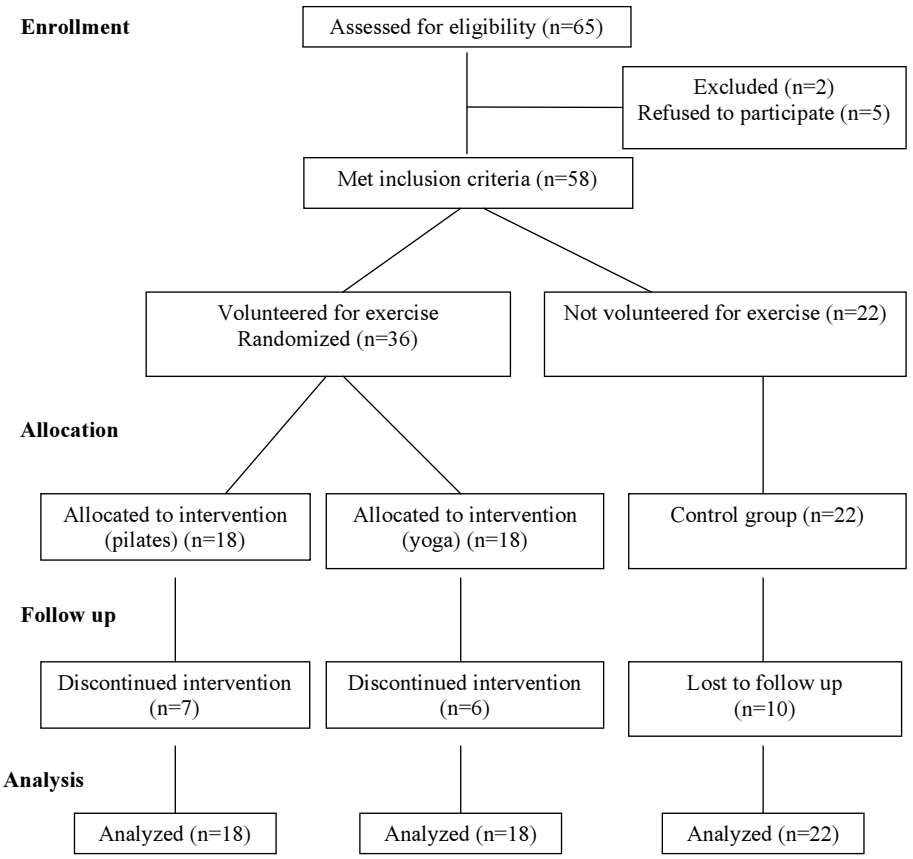


Figure 1— The flow of participants through each stage of the trial.

Table 1— Content of Pilates Intervention

Phases / Duration	Position	Exercises
Warm up (10 minutes)	Standing / sitting	Neck exercises
		Shoulder exercises
		Stretching
		Breathing exercises
Pilates exercises (30 minutes)	Standing / sitting / supine /side lying	The Hundred
		Roll Down – Roll Up
		Single Leg Circles
		Rolling Like A Ball
		Single Leg Stretch
		Double Leg Stretch
		Spine Stretch Forward
		Criss – Cross
		Saw
		Neck Roll
		Single Leg Kick
		Double Leg Kick
		Side Kicks (Front, Up-Down, Circles)
Cool down (10 minutes)	Supine	Stretching
		Breathing exercises

Table 2— Content of Yoga Intervention

Phases / Duration	Position	Exercises
Warm up (10 minutes)	Standing / sitting	Neck exercises
		Shoulder exercises
		Stretching
		Breathing exercises
	Standing	Simple chest expansion (Ardha Chakrasana)
		Circular motion (half back and front rotation)
		Side stretch
		Mountain pose (Tadasana)
		Triangle pose (Trikonasana)
		Balance posture poses
		Sun salutation
	Seated on chair	Simple spinal twist
		Elbow exercises
		Shoulder raise
		Breathing and diaphragm exercises
	Seated on mat	Easy pose (Sukhasana)
		Child's pose (Balasana)
		Half spinal twist (Ardha Matsyendrasana)
		Full twist
		Knee and thigh stretch (Bhadasana)
		Staff pose (Dandasana)
		The great seal (Mahamudra)

(Devam ediyor)

Table 2— Content of Yoga Intervention *(Devamı)*

Phases / Duration	Position	Exercises
		Head to knee forward bend pose (Janusirsasana)
		Posture clasp - cow face pose (Gomuhasana)
		Adept's pose (Siddhasana)
Hatha Yoga (30 minutes)	Back bend	Half locust
		Cat pose (Bidalasana)
		Cobra pose (Bhujangasana)
		Dog pose (Adho Mukha Shvanasana)
		Spinal balance poses
		Bridge pose (Setu Bandha Saryangasana)
	Supine	Single leg raises
		Double leg raises
		Side raises
		Reclining hand to big toe pose (Supta Padangusthasana)
		Wind relieving pose (Pavanamuktasana)
		Revolved abdomen pose (Jathara Parivartanasana)
		Apana pose (Apanasana)
		Curl up breathing (Kapalabhati)
Finishing poses (10 minutes)	Supine	Deep relaxation
		Corpse Pose (Savasana)

Statistical Analysis

All statistical procedures were performed using SPSS for Windows version 11.5. The data were analyzed on an intention-to-treat basis. Missing post-intervention data were replaced using the last observation (baseline measurements) carried forward, but the missing data at the 6-month follow up were not replaced. The distribution of the data was investigated with the Shapiro-Wilk's test. Differences between the groups' baseline characteristics were compared using either analysis of variance (ANOVA) or Kruskal-Wallis tests for continuous variables when appropriate; in the case of any difference, post hoc analyses (Tukey or Mann Whitney U test, respectively) were applied. Proportions were compared using chi-square or Fisher exact tests when appropriate. To investigate whether the exercise interventions affected the outcome parameters, mean difference values ([mean values after intervention minus mean values before intervention], [mean values at 6 months post-intervention minus mean values before intervention] and [mean values at 6 months post-intervention minus mean values after intervention]) were analyzed by ANOVA or Kruskal-Wallis tests, with appropriate post hoc analyses. Mean differences in general physical activity subscale of PFQ, GPM and chair-stand and 2-minute step tests of the Senior Fitness Test were analyzed by ANOVA. The rest of the measurements were analyzed by Kruskal-Wallis test. According to the distribution plots of the data, Wilcoxon or paired-T tests were applied in order to explore the significance in change due to interventions. Two-tailed significance tests were used throughout the analyses. The statistical significance value is <0.05.

Results

Sixty-five subjects were assessed for eligibility and 58 of them were enrolled in the study. The mean age of the total group was 78.0±6.8 years and the majority of them were women (74.1%), unmarried including widowed and divorced (87.9%), retirees (84.5%), had more than 8 years of education (77.6%) and the mean duration of their stay in the facility was 3.5±2.9 years. Most of the participants had a current healthy lifestyle with no smoking (91.4%) or no drinking habits (93%) and more than half of them (54.5%) were moderate to highly physically active, according to IPAQ. The cognitive statuses of the elderly were good, with an MMSE score of 27.7±2.5. Hypertension (77.6%), gastric problems (22.4%) and diabetes mellitus (20.7%) were among the most common comorbidities and the mean number of medications

Table 3— Baseline Characteristics of The Subjects According to Groups.

Characteristic	Pilates Group (n=18)	Yoga Group (n=18)	Control group (n=22)	X^2 value	p value
Age, mean ± SD	76.2 ± 7.5	77.2 ± 6.4	80.0 ± 6.2	-	0.192
Men, n (%)	3 (16.7)	3 (16.7)	9 (40.9)	4.185	0.063
Married, n (%)	1 (5.6)	2 (11.1)	4 (18.2)	1.248	0.409
Education < 8 years, n (%)	3 (16.7)	4 (22.2)	6 (27.3)	0.481	0.529
Positive fall history, n (%)	4 (22.2)	6 (33.3)	9 (40.9)	1.069	0.216
Systemic diseases, n (%)					
Hypertension	15 (83.3)	12 (66.7)	18 (81.8)	0.365	0.747
Diabetes mellitus	0 (0)	4 (22.2)	8 (36.4)	5.307	0.042*
Thyroid disease	6 (33.3)	1 (5.6)	1(4.5)	2.549	0.139
Lung disease	3 (16.7)	3 (16.7)	2 (9.1)	0.296	0.698
Cancer	1 (5.6)	2 (11.1)	3 (13.6)	0.414	0.664
Osteoporosis	10 (55.6)	9 (50)	13 (59.1)	0.056	0.963
Joint prosthesis	3 (16.7)	2 (11.1)	2 (9.1)	0.296	0.698
BMI (kg/m^2)	29.4 ± 3.5	31.5 ± 3.6	31.0 ± 1.9	-	0.299
Physical examination					
Neck tenderness	7 (38.9)	10 (55.6)	6 (27.3)	2.851	0.322
Knee tenderness	5 (27.8)	7 (38.9)	4 (18.2)	1.917	0.230
Low back tenderness	8 (44.4)	11 (61.1)	9 (40.9)	1.198	0.632
Ambulation aid, n (%)	1 (5.6)	4 (22.2)	2 (9.1)	0.338	0.695
MMSE, score	28.2 ± 1.8	27.8 ± 2.1	27.2 ± 3.1	-	0.701
Low IPAQ category, n (%)	3 (16.7)	7 (38.9)	8 (44.4)	9.855	0.280

*: p<0.05

was 3.6±1.9. A previous fall history in the last year was present in 32.8% of the elderly participants.

As shown in Table 3, all baseline characteristics of the participants in the 3 groups were similar, except for diabetes. There were significantly fewer diabetes mellitus patients in the Pilates group. The man/woman ratio was higher in the control group; physical activity levels were higher in the Pilates group and the use of an ambulation aid was higher in the yoga group than the other groups, but none of the differences were statistically significant.

Six subjects (6 women) from the yoga group and 7 subjects (2 men, 5 women) from the Pilates group did not complete the study. The causes of the drop out were unwillingness to attend to exercise classes (n=5 in the pilates group, n=4 in the yoga group) and systemic diseases (n=2 in the Pilates group; acute renal failure, acute gastritis, and n=2 in the yoga group; respiratory infection, metatarsal fracture). There were no differences in sociodemographic characteristics and baseline measures between the subjects who dropped out and those who completed the study. Among the subjects who completed the study, the mean number of classes attended was 19.9±4.2 and 19.6±4.7 for the Pilates and yoga intervention groups, respectively. One participant reported symptom of gastric reflux during the head down positions in the yoga group; he performed modified versions of those postures thereafter. No other signs or symptoms of discomfort occurred during yoga or Pilates sessions.

There was a significant difference in the NHP total score mean difference (before and immediately after intervention) among the three groups (0.95±14.10; -5.88±8.85; 5.84±11.78 for Pilates, yoga and control groups, respectively; p=0.007). This difference resulted from the significant decrease in the total NHP score of the yoga group. However, this effect was not detected after 6 months. Sleep scores (-2.22±21.57; -6.67±18.15; 10.00±22.04 for Pilates, yoga and control groups, respectively; p=0.026) and emotional reaction subdomains (-2.08±23.19; -6.94±15.59; 6.82±14.29 for Pilates, yoga and control groups, respectively; p=0.037) on the NHP decreased immediately after exercise in both groups, and post hoc analyses revealed that the decrease in sleep and emotional reaction scores reached significance only in the yoga group. These effects also did not persist after 6 months.

There were no statistically significant differences in GDS, PFQ including all the subcategories and GPM scores among

the groups immediately after and 6 months after the interventions.

No improvement was observed in balance scores immediately after intervention in either group (Figure 2). Hand grip strength increased significantly in the yoga intervention group (Kruskal-Wallis p=0.017, Mann Whitney U test between yoga and control p=0.008) but was not sustained after 6 months.

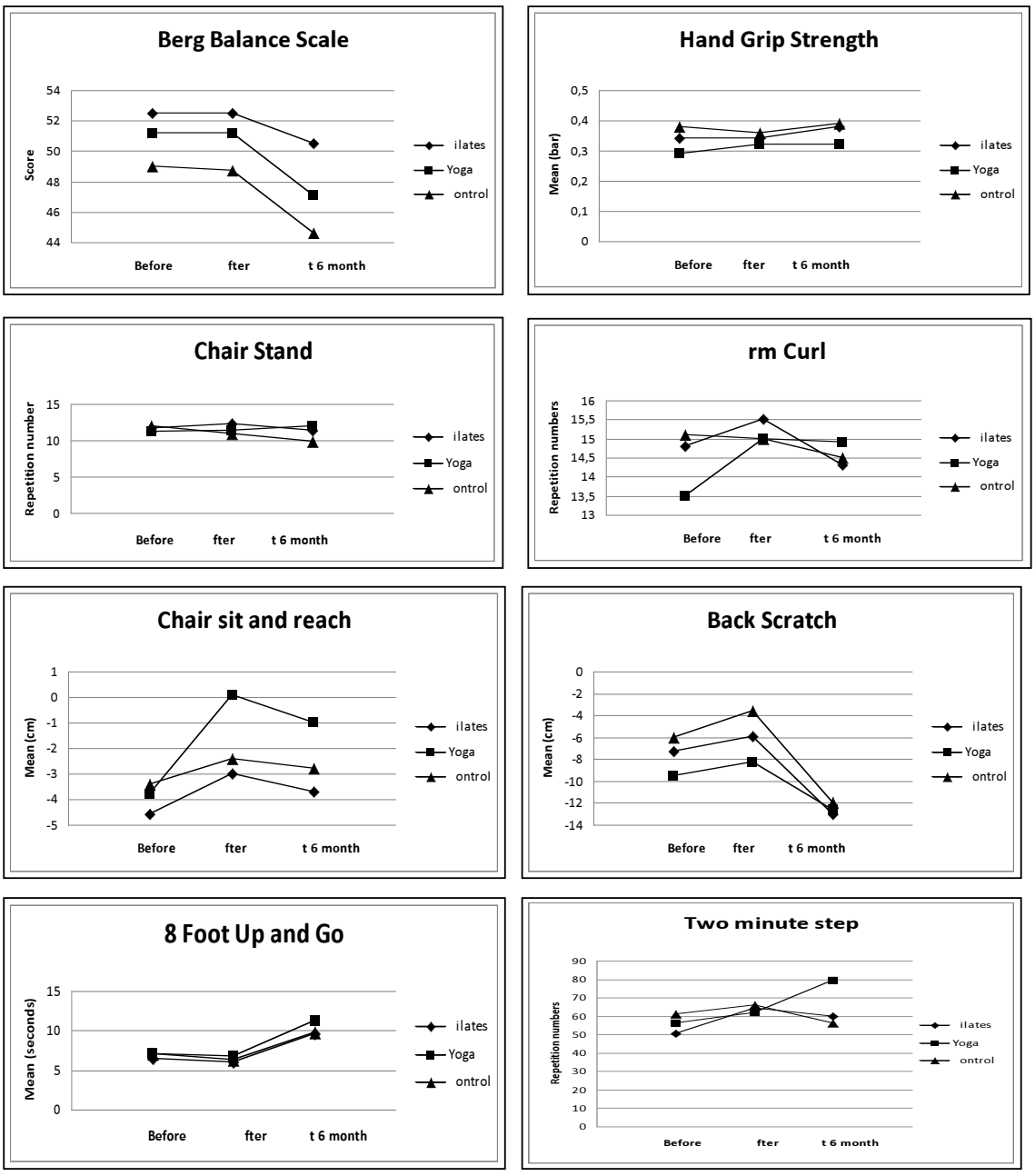


Figure 2— Berg balance scale, hand grip strength and senior fitness test scores before, immediately after and 6 months after the interventions in the 3 groups.
*: p<0.05 for the yoga group.

In the senior fitness test scores, only the results of the sit and reach test were reduced immediately after the yoga intervention (Kruskal-Wallis p=0.019, Mann Whitney U test between yoga and control p=0.031). This effect was no longer observed after 6 months. Improvements seen in chair stand and 8-foot up and go test scores did not reach statistical significance after the interventions (p=0.074 and p=0.083, respectively).

No change in any of the body composition parameters including weight, body mass index, percentage of fat, fat mass and fat free mass was observed after the interventions.

Mean difference measurements between 6 months post-intervention and baseline evaluations were not different among three groups.

Discussion

Subjects in the yoga group showed improvements in quality of life, with predominant changes in sleep and emotional reaction subcategories, increase in hand grip strength and flexibility of lower extremities after 8 weeks of yoga intervention. However none of these improvements could be maintained at 6 months after completion of the intervention. Yoga and Pilates interventions were regarded as safe for this population. A decrease in pain, depression or disability and improvements in balance or body composition were not observed.

Balance ability was expected to improve after both of these interventions. Relatively high BBS scores (52.5; 51.2; 49 in Pilates, yoga and control groups, respectively) revealed that subjects did not experience serious balance problems and exercise interventions might have appeared to be ineffective due to the ceiling effect. Oken et al. reported increments in a timed one leg stance parameter after 6 months of yoga training in community dwelling healthy elderly, (9) whereas Tuzun et al. observed no effect on tandem walk and body sway measures after 12 weeks (24). Kloubec et al. did not find improvement in the balance of healthy younger adults after 12 weeks of Pilates training (11). The 8-week training period of our study might not have been sufficient to obtain benefits in balance; a longer duration might prove efficacious as more challenging postures and exercises would be performed with advancing physical performance.

Earlier studies have investigated the impact of these exercise programs on depression and quality of life more often than on pain, balance and disability. Chen et al. observed decrements in depressive scores in elderly people who were relocated to an assisted living facility after 6 months of yoga training, and this change was not observed at 3 months (3). The initial depression scores in that study were also low, similar to our study. Shahidi et al. showed improvement in depression scores in community dwelling elderly participants with depression after only 10 sessions of laughter yoga (2). However, there is no information about the effects of Pilates on depression in the elderly. In our study, GDS scores were low (2.6; 3.9; 4.5 in Pilates, yoga and control groups, respectively) and did not change after the interventions; however, emotional reaction subscores on the NHP showed a significant decrease immediately after exercise in the yoga group. The NHP also evaluates other emotions like anxiety and anger. Yoga training in this study might have contributed to better control of subjects' emotions. Whether a longer training program would affect GDS scores remains unanswered.

There are many studies about the effects of yoga on quality of life in the elderly (8-10, 24), whereas fewer studies have investigated this outcome measure with Pilates (15). Quality of life increased in community dwelling healthy elderly participants immediately after yoga training, but long term effects were not investigated (9, 20, 24). In our study, elderly subjects living in the institution had improvements in quality of life immediately after yoga training, but not after Pilates training, and unfortunately they did not persist 6 months later. Improvements, especially in sleep and emotional reaction, lead to a suggestion that the mental component of yoga might play a role, and the 8-week time interval is enough for this effect, but only for short term. Improvements due to socialization and class participation were unlikely, since most of the subjects were attending the regular social programs. The difference observed in mental components between the yoga and Pilates groups may be a result of different breathing methods: inspiration and expiration through the nose in yoga versus inspiration through the nose but expiration through the mouth in Pilates. This hypothesis should be tested using a study with a different methodology. Deep relaxation performed at the end of the yoga session might also be more effective than the mind intervention offered by the Pilates method.

Flexibility, strength and endurance are expected to improve after both Pilates and yoga training. However, the only increments we observed were in the flexibility of lower extremities and hand grip strength in the yoga group. A small sample size, relatively short duration and intention to treat analysis may have prevented other parameters from reaching statistical significance. The health conditions of the study population, which had a reasonable baseline flexibility and strength, might also be a reason for the lack of measured benefit.

This study is unique in investigating the difference between two mind-body interventions in elderly subjects liv-

ing in a nursing care facility. Long term effects on the quality of life, pain, depression and physical performance, including balance, were evaluated. Favorable attendance rates, safety and feasibility encouraged yoga and Pilates training in the institutionalized seniors. Yoga training improved quality of life, sleep quality, strength and flexibility in seniors living in nursing facilities immediately after the interventions. Incorporating these training programs, especially yoga intervention, into the daily schedule of nursing facilities for a longer duration might aid in obtaining further improvements in other outcome measures and in maintaining the gained benefits in the long term.

Study Limitations

Small sample size, relatively short duration and lack of a precise randomization method were the limitations of our study. Although considerable effort was made to apply random assignment to three groups, motivation of the subjects to participate in the intervention classes in a relatively small population prohibited randomization. This might have introduced selection bias. However, the subjects in the control group explained that the reason for their agreement to be in the control group was that they were already participating in the morning exercise classes of the nursing home and this extra exercise class was considered redundant. The participants in the control group were also physically active, with similar IPAQ scores and all of the baseline parameters to the other subjects in the study. The difference between the yoga and Pilates classes was not affected, since randomization was applied in the intervention groups.

Absence of improvements in quality of life and physical performance 6 months after training should be taken into consideration. Training duration may be lengthened or maintenance programs after training may provide long term benefits.

Future studies with a larger sample size and longer duration of training would provide more information regarding the effects Pilates and yoga on physical performance of the elderly.

The results of this study cannot be generalized to community dwelling elderly subjects. Seniors in this study were from one nursing care facility; we suggest that this limits the extrapolation of the results to all institutionalized elderly. Our study population may be more physically active than subjects in other nursing homes in Turkey, as the socioeconomic status is higher. Our study population did not include fragile seniors with poor balance abilities and neurological disorders, so we can not make recommendations regarding use and safety of Pilates or yoga in these groups. Individualized rehabilitation programs are the effective and safe treatments that are recommended in fragile elderly persons with serious orthopedic and neurologic problems.

Conclusion

Yoga and Pilates training are safe for this small sized study population that are relatively in good health condition. Yoga improved the quality of life, sleep quality, strength and flexibility in seniors living in nursing care facilities only immediately after training. Observed benefits did not persist 6 months after training.

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Turkish Journal of Geriatrics
2014; 17 (3) 272-277

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RESEARCH

EFFECTIVENESS OF TREATMENT FOR QUITTING SMOKING AND MARAS POWDER USE IN PATIENTS AGED SIXTY YEARS OR OLDER

ABSTRACT

Introduction: The aim of this study was to investigate the effectiveness of treatment for quitting smoking and Maras powder use in patients aged 60 years or older, and to examine factors likely to be effective in stopping tobacco use.

Materials and Method: Out of 178 patients aged 60 years or older, who presented to our outpatient clinic for quitting smoking and Maras powder use, 115 for whom there were no missing data were enrolled in this study.

Results: Out of 100 patients who presenting to quit smoking, 76 (76.0%) were male and 24 (24.0%) were female. Fifteen patients who presenting to quit Maras powder use were all male. The mean age of the participants was 62.98±4.30 years (min=60, max=81) and did not differ between the female and male participants (p=0.351). Forty-eight smokers (48.0%) gave up smoking during treatment, but 52 smokers (52.0%) were still smoking during treatment. Eight Maras powder users stopped using the powder after treatment, but seven Maras powder users continued using Maras powder despite treatment.

Conclusion: We found that a high proportion of patients aged 60 years or older stopped using tobacco after treatment. Determination to stop tobacco use, appropriate treatment and regular follow-up play an important part in quitting tobacco use.

Key Words: Smoke; Tobacco Smokeless; Smoking Cessation

ARAŞTIRMA

SİGARA VE MARAŞ OTU BIRAKMA TEDAVİSİNİN 60 YAŞ VE ÜZERİ HASTALARDA ETKİNLİĞİ

ÖZ

Giriş: Bu çalışmada 60 yaş ve üzeri hastalarda sigara ve maraş otu (dumansız tütün) bırakma tedavisinin etkinliği ve tütün ürünlerini bırakmada etkili olabilecek faktörlerin incelenmesi amaçlanmıştır.

Gereç ve Yöntem: Sigara Bırakma Polikliniğine sigara ve maraş otu bırakmak için başvuran 60 yaş ve üzeri 178 hastadan, dosya verileri tam olan 115 hasta çalışmaya dahil edildi.

Bulgular: Çalışmada sigara bırakma için başvuran 100 hastanın 76'sı (%76.0) erkek, 24'ü (%24.0) kadındır. Maraş otu bırakmak için başvuran 15 kişinin tamamı erkekti. Katılımcıların yaş ortalaması 62.98±4.30 (min=60, max=81) idi. Kadın ve erkeklerin yaş ortalaması benzerdi (p=0.351). Sigara kullanıcılarının 48'i (%48.0) tedavimiz sonrasında sigarayı bırakmışken, 52'si (%52.0) sigara alışkanlığını devam ettiriyordu. Maraş otu kullanıcılarının 8'i tedavi sonrasında maraş otunu bırakmışken, 7'si maraş otu kullanmaya devam etmekteydi.

Sonuç: Çalışmada sigara ve maraş otu bırakmak için başvuran 60 yaş ve üzeri olguların tedavi sonrasında tütün ürünlerini yüksek oranda bıraktığı görülmektedir. Tütün ürünleri kullanımını bırakmada bireyin göstermiş olduğu kararlılık, uygun tedavi yöntemi ve düzenli hasta takibi büyük öneme sahiptir.

Anahtar Sözcükler: Sigara; Dumansız Tütün; Sigara Bırakma.

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Geliş Tarihi: 05/03/2014
(Received)

Kabul Tarihi: 02/04/2014
(Accepted)

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Introduction

There has been a sharp increase in the size of the elderly population throughout the world in recent years. The proportion of people aged 60 years and older is increasing every year. It is estimated that the world's elderly population aged ?60 years will be 1.2 billion in 2025 and 1.9 billion in 2050 (1), and that one of every three people will be 60 years or older in Europe in 2050 (2). According to data from the Turkish Statistical Institution, 7.7% of the Turkish population was ≥65 years old in 2013. It is estimated that the proportion of the population aged ≥65 years will be 10.2% in 2023, 20.8% in 2050 and 27.7% in 2075 (3).

The proportion of smokers aged 65 years or older is 8.3%-9.1% in the USA (4,5), 6.6%-30.3% in European countries (6) and 9.3%-13.2% in Turkey (7,8). Barriers to smoking cessation in elderly people have been reported to be long duration of smoking, a higher number of cigarettes smoked daily, fewer attempts and weaker intention to stop smoking, and lower levels of education (9,10). Stopping smoking, even at advanced ages, is of great importance for health.

In this study, we aimed to investigate the effectiveness of treatments directed toward quitting smoking and factors likely to affect smoking cessation in elderly people aged 60 years and older.

Materials and Method

This is a retrospective study performed in the outpatient clinic for quitting smoking at Kahramanmaraş Sütçü İmam University Hospital between January 2008 and December 2012. A hundred and seventy-eight patients aged 60 years or older presented to the outpatient clinic during the study period. Out of 178 patients, 115 for whom data were available in the patient records were included in the study sample. The patients were interviewed for 40-60 minutes when they presented to the outpatient clinic. Socio-demographic features, information about smoking and Maras powder (MP) use, results of the Fagerström Nicotine Dependence Scale (FNDS) and notes from a one-year follow-up were recorded. The FNDS was developed by Heatherton et al. (11) and its validity and reliability for the Turkish population were established by Uysal et al. (12); its Cronbach's alpha was found to be 0.56. The scale is composed of six questions and responses to each question are scored between 0 and 10. A score of ≤4 indicates mild addiction, 5 indicates moderate addiction and a score of ≥6 indicates severe addiction.

The patients were provided with support to give up tobacco and offered methods to refrain from and to replace tobacco. Following an initial examination, 15-min interviews at two week intervals were planned. Appropriate medications were recommended for their illnesses and they were involved in their treatment decisions. Those for whom nicotine replacement treatment (NRT) was recommended received this for two months (21mg/day for 4 weeks followed by 14mg/day for two weeks and 7mg/day for two weeks), and were advised to give up smoking on the day when the treatment was initiated. The patients who were prescribed Bupropion were informed that the treatment would last three months (150 mg/day for three days followed by 300 mg/day between the fourth day and twelfth week of treatment) and were advised to stop smoking on the tenth day of treatment. Treatment with Varenicline was given for 12 weeks (0.5mg/day for 1-3 days followed by 1mg/day starting on the fourth day of treatment and continuing till the twelfth week) and patients receiving this treatment were advised to quit tobacco use on the tenth day of treatment.

Patients were requested to rate their self-confidence in quitting smoking on a six-point scale. They were informed about the side-effects of treatment and their informed consent was obtained with respect to the treatment they received. The patients were followed in face-to-face interviews every two weeks for the first three months of treatment, followed by face-to- face monthly interviews for nine months. Patients who reported no use of tobacco after twelve weeks of treatment were considered to be "patients who quit smoking". Those who reported that they used tobacco at the end of the 12-month treatment period were advised to present to the outpatient clinic again.

Statistical Analyses

Statistical analyses were carried out with SPSS 20.0. Mean values, frequencies and standard deviations were used for analyses of the data. The Kolmogorov–Smirnov test was used to determine whether the data were normally distributed. Chi-square tests and Student's t tests were used to determine differences between the groups; $p<0.05$ was considered significant.

In accordance with Helsinki Declaration (Seul, 2008), approval was obtained from the ethical committee of the Medical School of Kahramanmaraş Sütçü İmam University.

Results

Out of 100 patients who presented to quit smoking, 76 (76.0%) were male and 24 (24.0%) were female. Fifteen

Table 1— Socio-demographic Features of the Participants

Features	n	%
Occupation		
Retired	72	62.6
Housewife	19	16.5
Worker	12	10.4
Farmer	8	7.0
Tradesman	4	3.5
Education		
Literate	13	11.3
Primary school	49	42.6
Secondary school	11	9.6
High school	24	20.9
University	18	15.7
Marital status		
Married	111	96.5
Single	4	3.5
Disease		
Hypertension	28	24.3
COPD	7	6.1
Diabetes	21	18.3
Asthma	8	7.0
Coronary artery disease	24	20.9

Table 2— Causes of Stopping Tobacco Use and Restarting Tobacco Use and Previous Attempts to Stop Tobacco Use

Variables	n	%
Causes of stopping smoking		
Doctors' recommendations	5	4.3
Because smoking is harmful to health	74	64.3
Because of a disease already present	33	28.7
Financial reasons	14	12.2
Because smoking disturbs others	11	9.6
Familial pressure	14	12.2
Because smoking is illegal	1	0.9
Causes of restarting tobacco use		
Increased stress	22	19.1
In a moment of anger	12	10.4
Recommendations by people around	14	12.2
Attempting to stop smoking in the year before the study was performed	43	43.0

patients who presented to quit MP use were all male. The mean age of the participants was 62.98±4.30 years (min=60, max=81). The mean age of patients wanting to stop smoking was 62.81±4.27 years and the mean age of patients wanting to quit MP use was 64.13±4.51 years. There was no significant difference in mean age between males and females (p=0.351). Socio-demographic features of the participants are shown in Table 1. Seventy-four participants (64.3%) reported that they wanted to quit tobacco use because they thought that it was harmful to their health.

The mean number of cigarettes smoked daily use the patients who wanted to quit smoking was 22.94±9.60 and the mean age of the smokers was 19.64±7.52 years. Cigarette consumption was 39.25±16.80 packages/year. The mean score on the FNDS was 6.23±2.12 (6.18±2.09 in males and 6.37±2.28 in females). There was no significant difference in mean FNDS scores between males and females (p=0.908). In addition, addiction to nicotine was mild in 20 participants (20.0%), moderate in 13 participants (13.0%) and severe in 67 participants (67.0%). The mean score for self-confidence in quitting smoking was 3.16±1.36 (min=0, max=5).

Forty-eight smokers (48.0%) stopped smoking during treatment, but 52 smokers (52.0%) continued their habit during treatment. Thirty-six male smokers (47.4%) and 12 female smokers (50.0%) gave up smoking; there was no significant difference between these groups (p=0.822). Of the patients who received only behavioral therapy, one (16.7%) stopped smoking. However, 23 (52.3%) patients who received Varenicline in addition to behavioral therapy, 18 (45.0%) patients who received Bupropion in combination with behavioral therapy, and six (60.0%) patients who received NRT as well as behavioral therapy quit smoking (Table 3). There no significant relation between types of treatment and success in quitting smoking (p=0.334). The relationship between education and success in quitting smoking was not significant either (p=0.974).

The distribution of features of tobacco use by the patients who quit smoking and those who continued to smoke is presented in Table 4.

The mean number of times per day MP was used was 19.13±7.82, the annual consumption of MP (packages/year) was 35.2±9.05 and the mean age of starting to use MP was 19.73±9.36 years. The mean score for self-confidence in quitting MP use was 4.20±0.94 (min=2, max=5).

Eight MP users stopped using the powder by the end of the treatment offered, but seven users continued to use the powder. The distribution of the patient who quit and those who did not quit MP use by treatment methods is shown in Table 5. Features of MP use in patients who quit and did not quit are shown in Table 4.

Table 3— Distribution of Patients Stopping and Not Stopping Smoking by Treatment Alternatives

Treatment Alternatives	Patients Stopping Smoking n(%)	Patients Not Stopping Smoking n(%)
Behavioral therapy	1 (16.7)	5 (83.3)
Varenicline + Behavioral Therapy	23 (52.3)	21 (47.7)
Bupropion + Behavioral therapy	18 (45.0)	22 (55.0)
NRT+ Behavioral Therapy	6 (60)	4 (40)
P	0.334	

Table 4— Characteristics of Patients Stopping and Not Stopping Smoking and MP Use

Characteristics	Patients Stopping Smoking Mean ±SD	Patients Not Stopping Smoking Mean ±SD	p
Mean age	62.10±3.78	63.46±4.61	0.113
Mean score for FNDS	6.20±2.17	6.25±2.10	0.923
Mean number of attempts to stop smoking	3.06±3.31	3.14±3.19	0.906
Mean number of cigarettes smoked a day	23.81±10.31	22.13±8.92	0.385
Mean age of starting smoking	19.60±7.19	19.67±7.89	0.964
Mean number of cigarette packets consumed a year (Packets / year)	3.16±18.40	39.32±15.36	0.962
Mean score for self-confidence in stopping smoking	3.22±1.29	3.09±1.44	0.630
Characteristics	**Patients Stopping MP Use**	**Patients Not Stopping MP Use**	**p**
Mean age	63.50±4.65	6.85±4.59	0.581
Mean age of starting to use MP	19.50±6.32	20.00+12.56	0.922
Consumption of MP (Packets / year)	32.75±8.79	38.00±9.16	0.278
Mean number of attempts to stop MP use	2.28±1.49	2.80±2.48	0.663
Mean number of MP use a day	21.87±9.23	16.00±4.69	0.153
Mean score for self-confidence in stopping MP use	4.37±.74	4.00±1.15	0.462

Discussion

In the present study, of all the patients who presented to quit smoking, 76.0% were male and 24.0% were female, which is consistent with the literature. Other studies from Turkey have also revealed that 25.3%-17.9% of smokers aged 65 years and older are male and 2.6%-1.6% of the smokers aged 65 years and older are female (7,8). In a study in Ankara, Turkey, of the elderly individuals who presented to stop smoking, 75.0% were male and 25.0% were female (13). The higher rate of the elderly male population in this study can be attributed to the fact that the rate of male smokers in the Turkish population is higher.

We found that the fact that tobacco use is harmful to health and that individuals develop chronic diseases were important causes of quitting smoking, while doctors' recommendations to stop smoking had a lower degree of importance. In a study on individuals aged ≥50 years in Canada, the rate of quitting smoking was found to increase after patients were diagnosed with chronic diseases (14). In a study on the causes of quitting smoking in individuals aged ≥65 in Turkey, it turned out that 33.0% of the participants stopped smoking due to diseases they already suffered, 34.7% stopped smoking due to fear of getting ill and 6.9% gave it up because of their doctors' recommendations (13). In the present study, the finding that health professionals' recommendations caused a low rate of smoking cessation indicates that health professionals' attempts to persuade smokers are not sufficient and are required to be more effective in our country.

Of all the patients in this study, 43.0% had attempted to quit tobacco products one year before they presented to our outpatient clinic, which is consistent with the research. In a study in the USA, 43.5% of people aged ≥65 years attempted to give up smoking one year before they participated (15).

In a study from Germany, 74% of the men aged 60-69 years and 72% of the women aged 60-69 years had an attempt to stop smoking before they were enrolled in the study (16).

Most patients who stopped smoking had a severe addiction to nicotine. Those patients who stopped smoking and those who failed to stop the habit were similar in terms of FNDS scores and amount of smoking (packets/year). The higher degree of nicotine addiction in the present study can be attributed to a long duration of tobacco use and inclusion of patients with addiction refractory to treatment, in contrast to the inclusion of patients with less severe addiction in previous studies. In a study on elderly patients by Darılmaz-Yüce et al., FNDS scores were not found to be significantly correlated with duration of smoking and success of treatment for quitting smoking (13). However severe the nicotine addiction is, behavior therapy and pharmacotherapy will increase both willingness and success of smoking cessation.

In this study, 48.0% of the smokers quit smoking after the treatment offered. The rates of male and female patients who quit smoking were similar. In a study in Singapore, the rate of smoking cessation after a 12-week treatment was found to be 36.0% (17). In a study from Turkey, 50.0% of the elderly patients gave up smoking one year after treatment (13). Many studies did not show a significant difference in rates of smoking cessation between males and females (13,18). The high rate of the smoking cessation in the present study may be due to the behavioral therapy and pharmacotherapy offered, and strict follow-up of the patients.

It has been reported in the literature that as education levels increased, so did success in stopping smoking (19). However, in the present study, we found that there was no significant relationship between education and success in stopping smoking. Another study from Turkey did not show a significant relationship between education and smoking cessation in patients aged ≥65 years (13). Lack of a significant relationship between education and success in stopping smoking can be explained by the fact that knowledge of methods used to stop smoking is independent of education level, and might have been due to our attempts to increase awareness of the issue in our outpatient clinic.

The pharmacological treatment alternatives used in the present study had similar rates of success in stopping smoking, which is consistent with the literature. In a study in Singapore, the rate of smoking cessation was 36.0% after 12 weeks of treatment with Bupropion and 36.0% after treatment with NRT (17). In a study in the USA, 28.5% of the elderly quit smoking six weeks after receiving behavioral treatment combined with nicotine patches (20). In a study from Italy, 33.2% of the people on Varenicline, 26.5% of the people on NRT and 24.2% of the people on Bupropion stopped smoking in the sixth week of treatment (21). In a study conducted in Ankara, Turkey, 41.0% of the patients receiving behavioral therapy only, 55.0% of the patients receiving both behavioral therapy and NRT, 46.0% of the patients receiving both behavioral therapy and Bupropion and 47.0% of the patients receiving both behavioral therapy and Varenicline stopped smoking (13). A combination of support therapy and pharmacological treatment plays an important role in stopping tobacco use. Pharmacological agents are of great importance in eliminating withdrawal symptoms experienced by individuals wanting to quit smoking, and in helping these people to bear the process of stopping smoking.

Maras Powder, i.e. *Nicotiana rustica linn*, is smokeless tobacco widely used in all cities of the East Mediterranean Region in Turkey, especially in Kahramanmaraş. MP is obtained by crushing the leaves of a plant called Nicotiana rustica linn and mixing it with ash (22). It is either moistened, put in a piece of paper and smoked or put in the inner side of the lips without using paper, and absorbed.

In the present study, the participants presenting to quit MP use were all male, which is congruent with the literature. In a study performed in USA, 6.2% of the healthy male population and 0.2% of the healthy female population were found to use smokeless tobacco (23). Higher rates of males using smokeless tobacco may be due to the fact that smokeless tobacco use is considered a male behavior. All the participants presenting to stop MP use in this study were male. It may be that the rate of MP use is higher in males than in females in Kahramanmaraş province.

Effects of pharmacological therapies on quitting MP use were similar. In addition, the proportion of patients who quit MP use was similar to that of patients who stopped smoking. In addition, patients who quit MP use and those who stopped smoking were similar in terms of their characteristics of tobacco use. In addition, the findings of this study with respect to patients who stopped smoking were consistent with the findings reported in the literature (13).

Conclusion

This study revealed that a high proportion of patients aged 60 years or over stopped smoking and using MP after receiving treatment. Determination to stop smoking, appropriate treatments and strict follow-up of patients are of signif-

icance in stopping the use of tobacco products. Stopping tobacco use will contribute to reduction of morbidity and mortality in the population, especially in the elderly. All patients presenting to health centers should be questioned about their tobacco use and advised to stop it, which will reduce the number of tobacco users in the population.

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Turkish Journal of Geriatrics
2014; 17 (3) 278-284

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RESEARCH

ADAPTATION OF ELDERLY DIABETIC PATIENTS TO ACTIVITIES OF DAILY LIFE AND EVALUATION OF THEIR SELF-CARE ABILITIES

ABSTRACT

Introduction: The aim of this study was to evaluate the adaptation of elderly diabetic patients to activities of daily life and their self-care abilities.

Materials and Method: This study was a descriptive survey conducted 1068 patients with Type 2 diabetes who applied to the Internal Medicine Polyclinic of Kars State Hospital between March 2012 and December 2013. The sample group was composed of 1045 patients aged 60 and older, who agreed to participate in the study, had been diagnosed with Type 2 Diabetes for at least 1 year, and were able to communicate. A Personal Information Form, Self-Care Ability Scale, and Instrumental Activity of Daily Living index were used as data collection tools.

Results: We found that 27.3% of patients had a deficiency in seeing, 70.8% hearing, 56.9% moving, and 74.5% tasting; 63.4% used an instrument/prosthesis/device and 74.5% used a walking stick. Evaluating the distribution of patients' states of dependence according to their physical deficiency, it was determined that while patients who had problems with seeing, hearing, moving, and tasting were not able to fulfill their activities of daily life independently, those using auxiliary instruments had difficulty in fulfilling their activities of daily life independently.

Conclusion: Patients experienced deficiencies in activities of daily life, tried to complement their physical deficiencies through the use of auxiliary instruments, and also had low mean scores for self-care ability.

Key Words: Diabetes Mellitus; Activities of Daily Living; Self Care.

ARAŞTIRMA

YAŞLI DİYABET HASTALARININ GÜNLÜK YAŞAM AKTİVİTELERİNE UYUMU VE ÖZ BAKIM GÜCÜNÜN DEĞERLENDİRİLMESİ

ÖZ

Giriş: Bu araştırma yaşlı diyabet hastalarının günlük yaşam aktivitelerine uyumunu ve öz bakım gücünü değerlendirilmesi amacıyla yapılmıştır.

Gereç ve Yöntem: Tanımlayıcı olarak yapılan bu araştırmanın evrenini Mart 2012- Aralık 2013 tarihleri arasında Kars Devlet Hastanesi Dahiliye Polikliniklerine baş vuran 1068 Tip 2 Diyabet hastası, çalışma grubunu ise araştırmaya katılmayı kabul eden, iletişime açık, en az 1 yıldır Tip 2 Diyabet tanısı alan, 60 yaş ve üstü 1045 hasta oluşturmuştur. Çalışma verilerinin toplanmasında hastaların tanıtıcı özelliklerini içeren Kişisel Bilgi Formu, Günlük Yaşam Aktiviteleri Ölçeği ve Öz-Bakım Gücü Ölçeği kullanılmıştır.

Bulgular: Hastaların %27.3'ünün görme, %70.8'inin işitme, %56.9'unun hareket, %74.5'inin tat almada yetersizlik yaşadığı, %63.4'ünün Alet/Protez/cihaz kullandığı, %74.5'inin baston kullandığı saptanmıştır. Hastaların fiziksel yetersizliğine göre bağımlılık durumlarının dağılımına bakıldığında; görme, işitme, hareket, tat alma sorunu yaşayanlarda bağımsız olarak günlük yaşam aktivitelerini yapmakta yetersiz oldukları, yardımcı araç-gereç kullananlarda ise günlük yaşam aktivitelerini yine bağımsız bir şekilde yerine getirmekte zorluk yaşadıkları saptanmıştır. Tip 2 Diyabete özgü bağımlılık durumları incelendiğinde 11 yıldan fazla süredir diyabet hastası olanlar, kan glikoz seviyesini düzenli ölçmeyenler, diyabetten başka hastalığı olmayanlar, diyabete ilişkin komplikasyon yaşayan hastaların bağımsız olarak günlük yaşam aktivitelerini yapmakta yetersiz oldukları saptanmıştır.

Sonuç: Hastaların günlük yaşam aktivitelerinde yetersizlik yaşadıkları, yardımcı alet kullanarak fiziksel yetersizliklerini tamamlamaya çalıştıkları ve Öz bakım gücü puan ortalamalarının düşük olduğu bulunmuştur.

Anahtar Sözcükler: Diyabet; Günlük Yaşam Aktiviteleri, Öz Bakım.

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Geliş Tarihi: 31/03/2014
(Received)

Kabul Tarihi: 02/06/2014
(Accepted)

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Introduction

Diabetes is a chronic disease that lasts a lifetime, directly concerns individuals of all ages, affects self-care activities due to its irreversible and chronic damage and shortens the length of life (1). It is of primary importance to meet the physical needs of individuals with a chronic disease. In particular, impairment of activities of daily life (ADL) and restriction of physical activities cause the greatest disturbance for these patients (2). ADL are mainly involved in physical functions and comprise the entire life. ADL are divided into two main subgroups: basic (mobility, self-care activities) and auxiliary (preparing food, driving, shopping, going to work) (3,4). It has been reported that complications such as muscular force deficiency, peripheral arterial disease, peripheral nerve injury and depression, anxiety, diminished self-confidence, personal awareness level and negative beliefs about the disease cause insufficiencies in the ADL of diabetic patients (5). Although it is a physical disease, diabetes also has psychosocial dimensions and leads to a series of physical, emotional, social and sexual problems and conflicts (5,6). This process causes diabetic individuals to encounter barriers at several different levels. Disability is the failure to lead a life that is accepted as normal according to the age, gender, social and cultural state of the person, due to inability or impairment. It involves malfunctions and failures in social life. In other words, disability is an individual's loss of freedom due to pathology (7). Self-care, on the other hand, includes the actions of individuals to protect their personal life, health, and well-being. The target in self-care is to enable the individual to take on all responsibilities concerning her/his own health (8). It is important to meet self-care needs in individuals with a chronic disease like diabetes. The majority of individuals diagnosed with diabetes are obliged to follow and apply arrangements concerning self-care at some stages of their lives (7). Thus, nurses should evaluate the efficiency of a patient's self-care activities with observation and interview techniques (5). Regarding the psychosocial problems of diabetes, care principles of the nurse involve enabling the patient to manage her/his disease, adapt to his/her own self-care behaviors, increase her/his independence and self-esteem, and cope with stressors that might affect the blood glucose level (8).

The aim of this study was to evaluate the adaptation of elderly diabetic patients to activities of daily life and their self-care abilities.

Materials and Method

This study was a descriptive survey consisting of 1068 patients with Type 2 diabetes who applied to the Internal Medicine Polyclinic of Kars State Hospital between March 2012 and December 2013. The study was conducted with 1045 patients who were present at the polyclinic. The patients were aged 60 and older, had been diagnosed with Type 2 Diabetes for at least 1 year, and were open to communication and were conscious and consented to participate in the study. 97.8% of patients who were selected for the sample group participated in the study. Before data collection began, patients were informed about the purpose of the study and asked to give verbal consent to participation in it. A convenient time was determined with patients who agreed to participate in the study and the questionnaires were administered by researchers for 45 minutes.

Data Collection

A Personal Information Form, including the descriptive features of the patients, the Index of Activities of Daily Life and the Self-Care Ability Scale were used for data collection.

Personal Information Form

This form was prepared by researchers in line with a literature review. The personal information form includes information about socio-demographic variables, metabolic and clinical parameters and diabetes history of the patients (6-8).

Self-Care Ability Scale

This scale measures how the individual perceives his or her ability to carry out the activities required to sustain her/his health. It was developed by Kearney and Fleicher (1979) (9) and adapted for the Turkish population by Nahçıvan (1993) (10). The self-care ability scale involves 35 items and each statement is scored from 0 to 4 as follows: 4 points for "It defines me well", 3 points for "It defines me a little", 2 points for "I have no idea", 1 point for "It does not define me much" and 0 points for "It does not define me at all". 8 statements (3, 6, 9, 13, 19, 22, 26, 31) are presented as negative and the scoring is reversed. The score obtained from the test reflects the extent of the individual's ability to sustain her/his health and well-being. The maximum score, showing the highest degree of self-care ability, is 140. The levels of self-care ability are as follows: 24–64 poor, 65–100 moderate, 101–112 good, 113–140 very good.

Independence in Activities of Daily Living (IADL): The Index of Independence in Activities of Daily Living was developed by Shelkey and Wallace (11). The IADL /AGYA Scale is aimed at determining which of 14 activities (bathing, dressing, using the toilet, standing up-sitting down, leaking urine and stool, eating, phoning, shopping, preparing food, doing the laundry, using transportation, taking drugs, and using money) are essential to the patient's personal care, are complex needs within the patient's environment that require independence, and can or cannot be performed by the individual. The IADL /AGYA expresses being dependent in activities with '0' points and independent with '1' point, and is evaluated on the basis of a total of 14 points (6 points in IADL and 8 points in AGYA). On this index, a score of 0-7 is considered insufficient, while a score of 8-14 is considered sufficient.

Data Evaluation

The data were analyzed using SPSS (Statistical Package for the Social Sciences) 15, on the computer. Number, percentages, means, and Pearson's correlation analyses were used to assess the data.

Table 1— Socio-Demographic Characteristics of Patients

Variables	Number	%
Gender		
Female	543	54.3
Male	502	45.7
Educational Status		
Illiterate	280	26.8
Literate	475	45.5
Primary school	181	17.4
High school and above	109	10.3
Marital Status		
Married	649	62.2
Single	396	37.8
Levels of Income		
More income than expenditure	221	21.2
Equal income and expenditure	355	34.0
Less income than expenditure	469	44.8
Number of children		
None	142	13.6
1-2 children	304	29.1
3 children and more	599	57.3
Patient's residence		
Province	447	42.8
District	247	23.7
Village	351	33.5
TOTAL	**1045**	**100**

Ethical Dimension of the Study

We obtained written permission from the Provincial Directorate of Health, with which the state hospital where the study was conducted was registered, and verbal permission from patients who participated in the study.

RESULTS

Patients who participated in the study had an average age of 68.35±9.24; 54.3% were women, 67.3% were married, 45.5% were literate, 44.8% had less income than expenditure, 57.3% had 3 or more children, and 42.8% lived in the city center (Table 1).

It was determined that 53.7% of patients had been diagnosed with diabetes for 11 years or more, 64.3% did not get their blood glucose checked regularly, 65.6% had another disease apart from diabetes, and 54.7% received insulin treatment. The average disease period of patients was determined as 10.34±5.18 years, average BMI was 26.4±4.45, and average HbA1c was 8.34±3.65. It was also determined that 27.7% of patients had diabetic retinopathy, 22.1% had nephropathy, 33.2% had cardiovascular problems, 28.3% had neuropathy, and 10.6% had diabetic foot (Table 2).

Table 2— Features of Patients Concerning the Disease

Variables	Number	%
Diagnosis time		
1-5 years	219	21.0
6-10 years	264	25.3
>11 years	562	53.7
State of regularly checking blood glucose		
Yes	671	64.3
No	374	35.7
State of having another disease apart from diabetes		
Yes	685	65.6
No	360	34.4
Treatment type		
Diet	126	12.1
Oral antidiabetic	346	33.2
Insulin	573	54.7
*Diabetes-associated complications		
Retinopathy	289	27.7
Nephropathy	230	22.1
Neuropathy	295	28.3
Cardiovascular problems	346	33.2
Diabetic foot	110	10.6
TOTAL	**1045**	**100**

*Patients with multiple complications

Table 2— Distribution of Physical Deficiency Features and Activities of Daily Life of Patients in Terms of the States of Being Affected

Physical Deficiency	Affected		Not Affected	
	Number	%	Number	%
Deficiency type				
Seeing	237	69.3	106	30.1
Hearing	166	65.7	87	34.4
Moving	127	56.9	96	43.1
Tasting	136	60.1	90	39.9
Use of Instrument/Prosthesis/Device				
Using	488	81.8	108	18.2
Not Using	359	79.9	90	20.1
Type of Instrument/Prosthesis/Device				
Glasses	235	82.4	50	17.6
Hearing aid	247	71.8	97	28.2
Extremity prosthesis	108	56.8	82	43.2
Walking stick	178	78.7	48	21.3

We found that 27.3% of patients had a deficiency in seeing, 70.8% in hearing, 56.9% in moving, and 74.5% in tasting; 63.4% used an instrument/prosthesis/device and 74.5% used a walking stick (Table 3).

Evaluating the distribution of patients' states according to their physical deficiency, we determined that while patients who had problems with seeing, hearing, moving, tasting were not able to fulfill their activities of daily life independently, those using auxiliary instruments (glasses, hearing aid, prosthesis, walking stick) had difficulty in fulfilling their daily life activities independently (Table 4).

Examining the relationship between the features of Type 2 Diabetes and the dependence level; it was determined that patients who had had diabetes for more than 11 years, did not regularly take their blood glucose levels, had no other disease than diabetes, and experienced diabetes-related complications remained insufficient in carrying out their daily life activities independently (Table 5).

Table 4— Distribution of Dependence States of Patients according to Their Physical Deficienciesd

	DLA Dependence State								
	Fully Dependent		Fully Dependent		Fully Dependent		Fully Dependent		
	Number	%	Number	%	Number	%	Number	%	p
Deficiency type									
Seeing	142	37.3	95	40.0	106	22.7	343	32.8	.001
Hearing	54	21.3	112	44.2	87	34.5	253	24.2	
Moving	53	23.7	74	33.1	96	43.2	223	21.3	
Tasting	70	30.9	66	26.5	90	42.6	226	21.7	
Use of Instrument/Pros-thesis/Device									
Using	296	81.1	192	49.0	108	54.6	596	57.0	.963
Not Using	69	18.9	200	51.0	90	45.4	449	43.0	
Type of Instrument/Pros-thesis/Device									
Glasses	167	58.6	68	23.8	50	17.6	285	27.2	.001
Hearing aid	136	39.5	111	32.2	97	28.3	344	32.4	
Extremity prosthesis	98	51.5	92	48.4	82	43.1	190	18.8	
Walking stick	125	55.3	53	23.4	48	21.3	226	21.6	

Table 4— Distribution of Dependence States of Type 2 Diabetes according to Their Physical Deficiencies

	DLA Dependence State								
	Fully Dependent		Fully Dependent		Fully Dependent		Fully Dependent		
	Number	%	Number	%	Number	%	Number	%	p
Diagnosis time									
1-5 years	45	10.1	50	12.6	70	33.8	165	15.7	.001
6-10 years	153	34.4	135	34.3	50	24.1	338	32.3	
>11 years	246	56.5	209	53.1	87	42.1	542	52.0	
State of regularly checking blood glucose									
Yes	163	30.1	100	28.1	70	47.2	333	57.0	.001
No	378	69.9	256	71.9	78	52.8	712	43.0	
State of having another disease apart from diabetes									
Yes	95	22.2	102	34.5	203	62.8	400	38.2	.001
No	332	77.8	193	65.5	120	37.2	645	61.8	
Treatment type									
Diet	100	10.1	105	12.6	103	30.5	308	15.7	.976
Oral antidiabetic	133	34.4	115	34.3	120	35.6	368	32.3	
Insulin	136	56.4	119	53.1	114	33.9	369	52.0	
Diabetes-associated complications									
Retinopathy	110	20.3	75	23.8	50	26.3	235	22.4	.001
Nephropathy	80	14.8	60	19.0	40	21.3	180	17.2	
Neuropathy	90	16.6	50	15.8	30	15.7	170	16.2	
Cardiovascular problems	95	17.5	60	19.0	40	21.0	195	18.6	
Diabetic foot	165	30.8	70	22.4	30	15.7	265	25.6	

Discussion

It was determined that 64.3% of the patients did not get their blood glucose levels checked regularly and that 65.6% had one or more chronic disease apart from diabetes. The literature indicates that the presence of chronic diseases accompanying diabetes cause a decrease of glycemic control in patients, limitation of their lives, negative changes primarily in nutrition and lifestyle, and difficulty taking responsibility for self-care (12-15).

This study revealed that a great majority of patients experienced complications associated with diabetes, which prevented them from meeting their activities of daily life and self-care needs independently. Furthermore, of the patients who had a low mean score on the IADL, (4.23±1.44), 69.3% had vision problems and 82.4% used glasses. 81.8% of patients performed their daily activities with the help of auxiliary instruments (hearing aid, prosthesis, walking stick). There have been various studies on daily life activities of diabetic patients. Choi et al. (2014) stated that individuals with Type II diabetes encountered physical deficiencies 2.5 times more often than healthy individuals (16). In a study investigating the physical deficiency level in diabetic individuals aged 60 and older, it was determined that patients experienced a high-level difficulty in walking, climbing the stairs and doing housework (17). Similarly, a study evaluating disability associated with diabetes in elderly women also determined that participants experienced serious levels of disabilities in both basic daily life activities (such as bathing) and auxiliary daily life activities (such as phoning) (18). In their study on the expectations of elderly patients with Type II diabetes with respect to healthcare, Huang et al. established that these expectations mainly involved primary and independently fulfilling daily life activities (19). In their study on the participation of healthy and diabetic individuals in activities of daily living, Wu et al. determined that more than 74% of diabetic individuals were insufficient in their basic daily life activities and more than 50% were insufficient in auxiliary daily life activities (20). Our study showed that patients with Type 2 diabetes experience different levels of limitations in

activities of daily life, which was consistent with the literature (21).

This study revealed that patients had a low average score on the Self Care Ability Scale (63.34± 9.28). According to Orem, an individual is required to have sufficient self-care ability to meet her/his self-care needs (22). Self-care ability is the skill of carrying out the health activities necessary to sustain life, health and well-being (22,23). The skill of a diabetic individual to know, start, sustain and manage insulin or oral antidiabetic drugs indicates her/his self-care ability (23,24). In their studies, Özkan and Duna (25) and Karakurt et al. (26) also found that diabetic patients had low self-care ability. The health and disease perception of an individual affects her/his behaviors. It has been observed that the severity of an individual's disease, whether she/he considers the suggestions useful or not, and her/his beliefs and attitudes on this subject affect her/his active participation in arrangements concerning the disease; when these things are ignored, the interventions are ineffective (23).

Examining the relationship between the features of Type 2 Diabetes and the dependence level in our study; it was determined that those who had had Type 2 Diabetes for more than 11 years, did not regularly take their blood glucose levels, had no other disease than diabetes and experienced diabetes-related complications such as retinopathy and diabetic foot were dependent in sustaining their daily life activities. In literature, it is indicated that as the period of diabetes extends, it gets more difficult for the patient to comply with daily life activities (16-19). It was determined that diabetic patients regularly taking their blood glucose levels had increased levels of self-care ability and it became easier for them to adapt daily life activities, and also the prevalence of complications caused by diabetes was considerably little (22-25).

Conclusion

In this study, conducted to determine the adaptation levels of elder diabetic patients with respect to their activities of daily life and self-care ability, it was determined that: patients experienced deficiencies in daily life activities, tried to complement their physical deficiencies using auxiliary instruments; and had low mean scores in self-care ability. Given these results, it is recommended that health care professionals determine the factors that decrease or increase the self-care skills of patients, and conduct relevant studies with larger groups.

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Turkish Journal of Geriatrics
2014; 17 (3) 285-289

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Geliş Tarihi: 26/04/2014
(Received)

Kabul Tarihi: 24/07/2014
(Accepted)

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RESEARCH

HEARING LEVELS IN PATIENTS WITH ALZHEIMER'S DEMENTIA

ABSTRACT

Introduction: It has been assumed that hearing loss may be related to dementia and prevents social interaction by decreasing stimulus input. The current study investigated the relationship between hearing loss and dementia by comparing Alzheimer's dementia patients to non-dementia patients.

Materials and Methods: Between January 2011 and January 2013, 124 Alzheimer's dementia patients diagnosed by the mini-mental state examination and 224 non-dementia controls who applied to the Psychiatry Clinic of Elazığ Training and Research Hospital were included in the study. Hearing levels of the Alzheimer's dementia patients and non-dementia controls were obtained using a pure tone audiometry test.

Results: The pure tone average was determined to be 50.96±12.25 dB and 50.49±12.15 dB, consecutively, in the right and left ears of Alzheimer's dementia patients. In the Alzheimer's dementia group of patients, researchers detected 6 (4.8%) patients with normal hearing, 23 (18.5%) patients with mild hearing loss, 57 (46%) patients with moderate hearing loss, and 38 (30.6%) patients with severe hearing loss. The pure tone average was determined to be 30.66±9.33 dB and 30.62±9.39 dB, consecutively, in the right and left ears of the control patients. In non-dementia controls, the researchers also detected 83 (38.8%) patients with normal hearing, 106 (45.5%) patients with mild hearing loss, 21 (9.8%) patients with moderate hearing loss, and 4 (1.9%) patients with severe hearing loss. The differences in the pure tone average of the right and left ears between Alzheimer's dementia patients and non-dementia controls were statistically significant ($p<0.05$). Nine (7.2%) Alzheimer's dementia patients and 6 (2.8%) controls were already using hearing devices.

Conclusion: The current study revealed that hearing loss was significantly higher in Alzheimer's dementia patients compared to non-dementia patients; this result indicates a relationship between dementia and hearing loss. Therefore, the researchers believe that hearing aids should be proposed for patients with geriatric hearing loss, with or without dementia, if they have relatively good cognitive functionality. Use of hearing aids could increase their cognitive and daily functioning.

Key Words: Alzheimer Dementia; Hearing Loss; Geriatrics.

ARAŞTIRMA

ALZHEİMER DEMANS TANILI HASTALARDA İŞİTME DÜZEYİ

ÖZ

Giriş: İşitme kaybının, uyarı girişini azaltarak, sosyal etkileşimi engellediği ve demansla ilişkili olabileceği düşünülmektedir. Bu çalışmada Alzheimer demanslı ve demansı olmayan gönüllü bireyler değerlendirilerek, işitme kaybı ile demans arasındaki ilişki ortaya konmaya çalışıldı.

Gereç ve Yöntem: Bu çalışma, Elazığ Eğitim ve Araştırma Hastanesi psikiyatri polikliniğine Ocak 2011 ile Ocak 2013 tarihleri arasında başvuran ve Mini Mental Test ile Alzheimer demans tanısı alan 124 hasta ile kulak burun boğaz kliniğine başvuran ve demansı olmayan 224 gönüllüden oluşmaktadır. Hastalara ve gönüllü bireylere saf ses odyometri testi yapılarak saf ses ortalamaları belirlendi.

Bulgular: Yapılan odyolojik incelemede Alzheimer demanslı grupta sağ kulak saf ses ortalaması 50,96±12,25 dB, sol kulak saf ses ortalaması ise 50,49±12,15 dB olarak belirlendi. Hastaların 6'sı (%4,8) normal, 23'ü (%18.5) hafif derecede, 57'si (%46) orta derecede, 38'i (%30.6) ise ileri derecede işitme kaybı yaşıyordu. Kontrol grubunda sağ kulak saf ses ortalaması 30,66±9,33 dB, sol kulak saf ses ortalaması ise 30,62±9,39 dB olarak belirlendi. Hastaların 83'ü (%38,8) normal, 106'sı (%45,5) hafif derecede, 21'i (%9.8) orta derecede, 4'ü (%1,9) ise ileri derecede işitme kaybı yaşıyordu. Sağ kulak ve sol kulak saf ses ortalamalarının Alzheimer demanslı ve kontrol grubundaki farkı istatistiksel olarak anlamlı bulundu ($p<0.05$). AD hastalarından 9'u (%7,2), kontrol grubunda ise 6 (%2,8) kişi işitme cihazı kullanmaktaydı.

Sonuç: Çalışmamızda demans hastalarında kontrol grubuna kıyasla anlamlı düzeyde işitme kaybı mevcut olup bu sonuç demans ile işitme kaybı arasındaki ilişkiyi ortaya koymaktadır. Bu nedenle demansı olan ve olmayan geriatrik işitme kayıplı hastalara kognitif işlevselliği görece iyi olup kullanabilecekse hastalara işitme cihazı önerilebileceğini, bu durumun bilişsel işlevselliklerini ve bu sayede günlük işlevselliklerini artırabileceğini düşünmekteyiz.

Anahtar Sözcükler: Alzheimer Demans; İşitme Kaybı; Geriatri.

Introduction

Dementia is a neuropsychiatric disturbance in which various cognitive functions, (primarily memory disturbances), personality changes, and various and variable psychiatric and behavioral symptoms are observed together. It is reported that in the United States of America (USA), there is a severe dementia rate of 5% and a slight dementia rate of 15% in populations aged 65 and above, and this ratio reaches 20% for severe dementia at ages 80 and above (1,2).

In the 21st century, as average life becomes longer and the ratio of elderly in the general population in Turkey increases, it is inevitable that dementia will become a public health problem.

Hearing loss is an important problem as it causes loneliness, decreases social activities, and leads to communication defects in the elderly. Some researchers report that by decreasing the stimulus, hearing loss prevents social interactions, which might be related to dementia (2-3).

In the present study, the researchers aimed to identify the correlation between hearing loss and dementia by evaluating volunteers with Alzheimer's dementia (AD) and patients without dementia.

Materials and Methods

One hundred twenty-four patients admitted to Elazığ Training and Research Hospital Psychiatry Clinic and 224 volunteers without dementia admitted to the Ear Nose Throat Clinic between January 2011 and January 2013 were included in the study.

Evaluation of Dementia

The diagnosis of dementia was made according to the dementia diagnostic criteria of DSM-IV-TR (4) by a specialist in psychiatry, at the end of a clinical interview. Additionally, the mini-mental state examination was performed on all patients. The mini-mental state examination (MMSE) was first published by Folstein et al. Although the test has limited specificity in the differentiation of clinical syndromes, it is a short, useful, and standardized method that can be used in the detection of cognitive level (5). The mini-mental state examination consists of eleven items under five main topics (orientation, record memory, attention and calculation, recall, and language) and is evaluated for a total of 30 points. It is composed of items that measure 10-point time and place orientation functions, 6-point memory functions (3 for record and 3 for recall), 5-point attention functions, 8-point language functions, and 1-point visual-spatial functions. The threshold value for the MMSE was determined to be 23/24 (6). Alzheimer dementia has been staged according to MMSE scale as follow: 20-23 point is slight, 10-19 is moderate and 0-9 is severe (7).

Evaluation of Hearing

After performing ear nose throat examinations on geriatric volunteers with Alzheimer's dementia and patients without dementia, an audiological examination (Interacoustic AC 40, Denmark) was performed in the audiology unit and hearing thresholds at 250, 500, 1000, 2000, 4000, and 6000 Hertz (Hz) were determined. Pure tone averages (PTA) at frequencies of 500, 1000 and 2000 Hz were determined. Hearing level was classified as normal hearing loss (0-25 dB), slight hearing loss (26 - 40 dB), moderate hearing loss (41-55 dB), moderate-severe hearing loss (56-70 dB), severe hearing loss (71-90 dB), and very severe hearing loss (91 dB and above) (8). Patients who could not adapt to the test, who had hearing loss in one ear, who had middle ear pathology, and who had hearing loss other than sensorineural loss were excluded from the study.

Statistical Analysis

SPSS (Statistical Package for Social Sciences for Windows 15.0.9) was used to evaluate the data obtained in the present study. After a database was created, statistical analyses were performed. Correlations between the parameters of the study in the AD group and the control group were evaluated using one-way analyses of variance and t-tests for continuous variables; categorical variables were evaluated using chi-square and multinomial logistical regression tests. Values of $p<0.05$ were accepted as statistically significant.

Results

Eighty-three patients (66.9%) with Alzheimer's dementia were female and 41 (33.1%) were male; the mean age was 82.9±5.17 years. One hundred twenty-one patients in the control group (56.5%) were female, and 93 (43.5%) were male; the mean age was 78.9±6.21 years (Table 1). Eighty-seven (70.2%) patients with Alzheimer's dementia had hypertension, and 104 patients (48.6%) had hypertension in the control group. Seventeen patients (13.7%) in the Alzheimer's dementia group and 25 (11.7%) patients in the control group had diabetes mellitus (Table 1).

Table 1— Data of The Control and Dementia Groups.

	Control (214)	Dementia (124)	P value
Mean Pure Tone			
Right ear, mean (SD)	30.66±9.33 dB	50.96±12.25 dB	0.001
Left ear, mean (SD)	30.62±9.39 dB	50.49±12.15 dB	0.001
Hearing level			
Normal	83 (38.8)	6 (4.8)	
Slight HL	106 (45.5)	23 (18.5)	
Moderate HL	21 (9.8)	57 (46.0)	
Severe HL	4 (1.9)	38 (30.6)	
Gender			
Female	121 (56.5)	83 (66.9)	
Male	93 (43,5)	41 (33.1)	
Age, mean (SD)			
Female	78.5±8.01	82.16±9.06	
Male	77.3±4.5	82.9±5.19	
Diabetes mellitus	25 (11.7)	17 (13.7)	
Hypertension	104 (48.6)	87 (70.2)	
Hearing device	6 (2.8)	9 (7.2)	

In the audiological examination, the mean pure tone of the right ear was 50.96±12.25 dB, and the mean pure tone of left ear was 50.49±12.15 dB in the AD group. Six patients (4.8%) had normal hearing, 23 (18.5%) had slight HL, 57(46%) had moderate HL, and 38 (30.6%) had severe HL in the AD group (Table 1). Five (4.8%) patients had normal hearing, 21(19.8%) had slight HL, 54 (50.9%) had moderate HL, and 26 (24.5%) had severe HL in slight AD group. One (5.6%) patient had normal hearing, two (11.2%) had slight HL, three (16.6%) had moderate HL, and 12 (66.6%) had severe HL in moderate AD group (Table 2).

In the control group, the mean pure tone of the right ear was 30.66±9.33 dB, and the mean pure tone of left ear was 30.62±9.39 dB. Eighty-three patients (38.8%) had normal hearing, 106 (45.5%) had slight HL, 21 (9.8%) had moderate HL, 4 (1.9%) had severe HL. The difference in the mean pure tone of the both right and left ears between the AD and control groups was found to be statistically significant ($p<0.05$). Nine patients (7.2%) in the Alzheimer's dementia group and six patients (2.8%) in the control group were using hearing devices (Table 1).

In control group, between the age of 70-79 years, 60 (72.3%) patients had normal hearing and 51 (41.1%) patients had hearing loss, between the age of 80-89 years, 20 (24.1%) patients had normal hearing and 72 (58.1%) patients had hearing loss and between the age of 90-99 years, 3 (3.6%) patients had normal hearing and 1 (0.8%) patient had hearing loss. In AD group, between the age of 70-79 years, 2 (33.3%) patients had normal hearing and 22 (18.6%) patients had hearing loss, between the age of 80-89 years, 4 (66.7%) patients had normal hearing and 82 (69.5%) patients had hearing loss and between the age of 90-99 years, no patient

Table 2— Demographics and Hearing Levels of Patients with Alzheimer Dementia According to MMSE Scale.

MMSE Level	Gender			Hearing Level			
	Female	Male	Age, mean (SD)	Normal (6)	Slight HL (23)	Moderate HL (57)	Severe HL (38)
Slight AD (23-20)	75 (70.7)	31 (29.3)	82.95 ±5.24	5 (4.8)	21 (19.8)	54 (50.9)	26 (24.5)
Moderate AD (19-10)	8 (44.4)	10 (55.6)	82.66 ±4.89	1 (5.6)	2 (11.2)	3 (16.6)	12 (66.6)
Severe AD (9-0)	–	-	-	-	-	-	–

Table 3— Association Between Hearing Loss and Age of Patients in Control and AD Groups

Control Age	Normal (83)	Hearing Loss (124)
70-79	60 (72.3)	51 (41.1)
80-89	20 (24.1)	72 (58.1)
90-99	3 (3.6)	1 (0.8)
Dementia Age	**Normal (6)**	**Hearing Loss (118)**
70-79	2 (33.3)	22 (18.6)
80-89	4 (66.7)	82 (69.5)
90-99	-	14 (11.9)

had normal hearing and 14 (11.9%) patient had hearing loss (Table 3). While statistically significant difference between hearing loss and age of patients was observed in control group (p=0.001), no significance between hearing loss and age of patients was detected in AD group (p=0.508).

DISCUSSION

Alzheimer's disease (AD) is a fatal neurodegenerative disease that presents with memory deficit, together with defects in language, management and decision making functions, defects in attention, orientation and personality, and a progressive loss of acquired intellectual skills. Alzheimer's dementia constitutes 50-70% of all dementia (9).

Age and gender are risk factors in Alzheimer's disease. While the disea9se incidence is rare before age 60, it increases to approximately 50% in ages 85 and above. In every five years, the risk of Alzheimer's disease increases fivefold before age 65, threefold before age 75, and 1.5 fold before age 85 (10). It is known that the disease occurs in females more frequently than males. The generally accepted female/male ratio is 2/1 (10). Advanced age was found as a risk factor for dementia in our patients. Furthermore, the number of female patients being twice the number of male patients was found to be consistent with the literature.

Different results have been reported on the effect of hypertension in Alzheimer's disease. While in some studies, hypertension does not seem to be a risk factor, in other studies it has been reported that a history of high systolic blood pressure and low diastolic blood pressure increased the risk (11,12). In the present study, there was hypertension in 87 (70.2%) patients in the AD group and 104 (48.6%) patients in the control group. Hypertension was detected more frequently in the AD group, compared to the control group. The presence of hypertension at a high rate in AD patients, compared to the control group, suggests that it might be a risk factor for AD.

While there are studies demonstrating that diabetes mellitus is not a risk factor for AD, there are also studies demonstrating that it causes a low risk (13,14). Diabetes mellitus was diagnosed in 17 patients (13.7%) in the AD group and in 25 patients (11.7%) in the control group, and the ratios of diabetes mellitus in both groups were close to each other.

Hearing loss in Alzheimer's disease develops as a result of structural changes in the ventral nucleus of the medial geniculate body and central nucleus of the inferior colliculus (15). The medial geniculate body is the station that has the most important role in central hearing function; its reflections are organized tonotopically. The dominant symptom in central hearing system disorders is the difficulty in understanding speech in the presence of background noise or a competitor auditory stimulus (16).

Hearing loss may be related to dementia due to the decrease in cognitive reserves, social isolation, and loss of environmental data (17). In studies investigating the effect of hearing loss on cognitive reserve, it was reported that in cases with poor auditory perception, more cognitive sources assume a role for auditory perception, which damages other cognitive processes such as study memory (18,19).

The allocation of neural sources to the hearing process may cause the exhaustion of cognitive sources that are reserved for other cognitive processes, and precipitate the earlier emergence of clinical symptoms of dementia (20). In animal studies that were performed to demonstrate the mechanism of the direct effect hypothesis of hearing loss on the neuropathology of AD, it was demonstrated that an increased environmental stimulus might decrease B-amyloid levels in transgenic rat models (21). This hypothesis was supported by the demonstration of low risk in individuals who perform activities in their free time (22). In the audiological examinations performed in the present study. The lower level of hearing in the AD group, compared to the control group, was found to be statistically significant ($p<0.05$). While the moderate hearing loss has been more frequently encountered in patients with slight stage AD, the patients with moderate stage AD have had more frequent severe hearing loss. We observed an association between presbyacusis and age of control patients. On the other hand, we didn't observe any association between presbyacusis and age of patients with AD.

The communication defects caused by hearing loss may cause social isolation in aged adults (23,24). The relation between poor social communication and dementia has been demonstrated in epidemiological and neuroanatomical studies (25,26). In the present study, there was hearing loss at a significant level in the dementia group when compared to the control group, and this result suggests that there might be a relationship between dementia and hearing loss. Thus, the researchers believe that hearing devices should be recommended to patients with geriatric hearing loss, with or without dementia, if they have relatively good cognitive functions. These devices could increase their cognitive, and thus daily, functions. The relation between Alzheimer's dementia and hearing loss could be further demonstrated with studies that included a greater number of patients, which would allow for the evaluation of hearing in a more extensive manner.

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Turkish Journal of Geriatrics
2014; 17 (3) 290-298

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RESEARCH

HOW DO OLDER AND YOUNGER ADULTS DIFFER IN DIRECTED FORGETTING?

ABSTRACT

Introduction: The aim of the present study is to compare younger and older adults in terms of directed forgetting, using both abstract and concrete memory materials.

Materials and Method: 50 healthy younger (aged 17-24 years) and 46 healthy older (aged 65-84 years) volunteers were included in the study. After a directed forgetting study phase in which abstract and concrete words were presented, the participants were given recall and recognition tasks.

Results: In the light of ANOVA results, the main (p <0.001 0.01, in recall respectively; p <0.001 0.01 and 0.01, in recognition respectively) and interaction effects of age, instruction type and concreteness level in both recall and recognition were found to be significant (p <0.01 0.001 and 0.001, in recall respectively; p <0.001 0.01 and 0.001, in recognition respectively), except for the main effect of concreteness level in recall (p=0.11).

Conclusion: It was concluded that the younger subjects showed an abstractness effect only in recall tasks, while the older participants displayed a concreteness effect in both recall and recognition tasks. Thus, the mind that tends to retrieve abstract materials in youth tends to retrieve more concrete materials in old age. In addition, with aging, people tend to process more irrelevant information by disrupting the inhibition mechanism.

Key Words: Aging; Memory; Inhibition.

ARAŞTIRMA

YAŞLI VE GENÇ YETİŞKİNLER YÖNLENDİRİLMİŞ UNUTMA AÇISINDAN NASIL FARKLILAŞIRLAR?

ÖZ

Giriş: Bu araştırmanın amacı, genç ve yaşlı yetişkinleri somut/soyut bellek materyali kullanarak yönlendirilmiş unutma açısından karşılaştırmaktır.

Gereç ve Yöntem: Araştırmaya 50 sağlıklı genç (17-24 yaşları arasında) ve 46 sağlıklı yaşlı yetişkin (65- 84 yaşları arasında) gönüllü katılmıştır. Somut ve soyut sözcüklerin sunulduğu bir yönlendirilmiş unutma çalışması sonunda katılımcılara hatırlama ve tanıma görevleri verilmiştir.

Bulgular: Varyans analizi (ANOVA) sonuçları ışığında, hatırlamada kelimelerin somutluk etkisi değişkeninin temel etkisi hariç (p=0,11) hatırlama ve tanımada yaş, yönerge türü ve kelimelerin somutluk düzeyi değişkenlerinin temel etkileri (hatırlamada sırasıyla, p <0,001 0,01; tanımada sırasıyla, p <0,001 0,01 ve 0,01) ve ortak etkileri (hatırlamada sırasıyla, p <0,01 0,001 ve 0,001; tanımada sırasıyla, p <0,001 0,01 ve 0,001) istatistiki olarak anlamlı bulunmuştur.

Sonuç: Genç yetişkinlerin sadece hatırlamada soyutluk etkisi gösterirken, yaşlı yetişkinlerin ise hem hatırlama hem de tanımada somutluk etkisi gösterdiği sonucuna ulaşılmıştır. Yani, gençlikte soyut hatırlamaya eğilimli zihin, yaşlılıkta daha fazla somut materyale yönelmektedir. Ayrıca, yaşlanmayla birlikte inhibisyon mekanizmasının bozulması sebebiyle kişiler daha fazla ilgisiz bilgiye yönelmektedir.

Anahtar Sözcükler: Yaşlanma; Bellek; Ketleme.

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Geliş Tarihi: 27/04/2014
(Received)

Kabul Tarihi: 22/07/2014
(Accepted)

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INTRODUCTION

In a model directed forgetting (DF) study, participants were presented with some words to study and during the presentation they were given directions; specifically, that some words must be remembered and some words forgotten. In other words, while subjects encoded each item they also encoded which were to be remembered (TBR) and which were to be forgotten (TBF) with the help of instructional cues. In this case, "directed forgetting effect" refers to a greater proportion of correct TBR items than of correct TBF items on a retention test (1). Two types of processes take place in directed forgetting; while participants direct all their cognitive processes to remembering TBR items by grouping them in their mind, they discriminate TBF items from TBR ones to forget them.

Two different methods are used in directed forgetting tasks: Item-by-item and list methods (2). In the item-by-item method, subjects are presented with a set of words, each of which is accompanied by an instruction to either remember or forget. In the list version, participants are presented with two lists of words. After the first list is read to participants, half of them are presented a "remember this list" instruction, while the other half are given a "forget this list" instruction. The second list is then presented with a remember instruction and at the end all the subjects are requested to remember as many words as possible from both lists, irrespective of the previous forget instruction. In directed forgetting studies, it has been observed that the age-related effect is reliably larger in the item-method than in the list-method studies (3).

In the present study, younger and older individuals were compared on a directed forgetting task using the item-by-item procedure. In the literature, both younger and older people significantly show the directed forgetting effect, but this effect is observed in young adults more than older ones (3). Zacks, Radvansky and Hasher (4) concluded that, compared to young ones, older participants recalled more TBF items than TBR in an immediate recall test, retrieved more TBF items in either delayed recall or recognition tests, and took a longer time to reject TBF items in an immediate recognition test. These results are explained by the view of reduced inhibition with aging. Thus, older individuals, in comparison with young people, are less able to ignore irrelevant information and consequently recall more TBF items.

Sego, Golding and Gottlob, (5) in their study using both list and item-by-item methods, observed the evidence of the directed forgetting effect for both younger and older groups, but the effect for older individuals was less than for the younger. Although this effect appeared in both recall and recognition tasks in the item-by-item method, it emerged only in recall in the list procedure. In that research, decreased inhibition of irrelevant information by older adults was supported as well. Although the elderly subjects recalled fewer TBR items, they recalled TBF items as well as the younger participants did. In conclusion, although the elderly obtained lower scores for TBR and TBF items, their scores were close to the young participants' scores.

In connection with this issue, Aguirre et al. (2) compared young-old and young adults' memory performance using the list method with selective forgetting procedure. The difference between standard directed forgetting and selective forgetting procedure (SDF) is that participants can selectively forget some information previously learned in SDF. With this respect, in that research participants were presented with List 1 consisting of information about two personality characters (Tom and Alex). In the second list, it was given information about other personality (Joe), and then the participants in forgetting condition were asked to forget items belonging to Tom. It was suggested that SDF entails more memory inhibition than nonselective procedure (standard DF procedure), because both selecting and suppressing specific memories require higher executive control. Supporting their hypotheses, older participants did not show SDF compared to young ones, namely they had so impaired performance to forget items and this finding verified inhibitory-deficit framework. They concluded that finding age-related differences in terms of cognitive control was definitely based on task demands.

On the other hand, Titz and Verhaeghen (3) in their meta-analysis draw the conclusion that a forget cue is more effective for younger people. In the literature, there is only one study that examines directed forgetting processes with abstract and concrete words (6). In that study, which measured ERP, researchers reached the conclusion that responding with concrete words has advantages over responding with abstract words, and this concreteness effect includes more contextual information in the TBF condition than in the TBR. In this sense, the present study is the first that compares younger and older adults in terms of directed forgetting by using concrete/abstract memory material.

The main motivation of the present study was to explore DF in item-by-item method with abstract and concrete materials and to make comparisons between memory performances of older and younger people. In the light of the literature, two hypotheses were proposed: 1). As it was mentioned in the



literature, younger participants will show more DF effect than older participants will. 2). Since remembering concrete materials is easier for them, older participants will indicate greater DF effect for concrete words compared to for abstract ones.

Materials and Method

Sample

The research sample was composed of younger and older participants living in Sivas and Tekirdağ provinces. 50 healthy young adults 17-24 years of age (24 women, 26 men) and 46 healthy older adults 65-84 years of age (16 women and 30 men) were included in the study. Thus, total number of participants is 96. Mean of age was 20.22 (SD= 2.43) in the younger group and 70.2 (SD=4.86) in the older group. The subjects were volunteers selected from all educational levels; while the average years of education in the younger group was 10.88 (SD=2.71), it was 9.87 (SD=3.9) in the older group. According to statistical analysis, any significant difference between two groups was not found with respect to year of education, $t(94) = -1.78$, $p > 0.001$. The younger participants consisted of individuals working in private or public institutions, while the elderly subjects were living in their homes, met the criteria for "healthy elderly", and were not working.

Three tests/scales were used for the purpose of selecting healthy subjects and screening: the Standardized Mini Mental Test (SMMT), the Geriatric Depression Scale (GDS) and the Functional Activities Questionnaire (FAQ). The people who got ≥25 points on the SMMT; ≤ 11 points on the GDS and ≤ 15 points on the FAQ in 2 or more activities for those 60-69 years of age, and ≤ 9 points on the FAQ in 3 or more activities for the 70 years of age and above, were not included in the sample. Young participants who got ≤ 17 points on the Beck Depression Inventory (BDI) were not included in the study. In addition, people who reported having neurological or psychological disorders, and using drugs that affect cognitive processes or having given up using this kind of drug recently, were not included in the sample. The mean scores and standard deviations of the scanning tests/scales and the exclusion criteria are summarized in Table 1.

The research received ethical approval (the verdict of Cumhuriyet University Faculty of Medicine, Medical Research Local Ethics Committee numbered 2013-07/15 and dated 02.07.2013), and before the study began, the written consent of all subjects was obtained using an Informed Consent Form.

Table 1— Means and Standard Deviations of Scanning Test/Scales and Exclusion Criteria

BDI (Younger)	M= 7.36	score ≥ 17
SD= 3.97		
SMMT (Older)	M= 28.09	score ≤ 25
SD= 1.26		
GDS (Older)	M= 5.3	score ≥ 11
SD= 3.13		
FAQ (Older)	M= 1.33	score ≥ 15 for 60–69 years of age in 2 or more activities; score ≥ 9 for 70 years of age and above in 3 or more activities
	SD= 0.57	

Materials

Tests and Scales Used For Screening

Standardized Mini Mental Test (SMMT)

The SMMT is a short test used to diagnose delirium and/or dementia, especially in the elderly, developed by Folstein et al (7). Validity and reliability studies of the Turkish version of this test, used for diagnosing mild dementia, were conducted by Güngen et al (8). The test, used in the assessment of general cognitive functions, is composed of 11 items grouped under five main headings: record memory, orientation, attention and calculation, recall, and language. The highest possible total score is 30.

Geriatric Depression Scale (GDS)

This scale, developed by Scheikh and Yesavage (9) is used to identify the people in the elderly population at risk of depression. Validity and reliability studies for the Turkish version of this test were conducted by Ertan and Eker (10). The internal consistency coefficient of this test was determined to be .91 and retest reliability to be .74. There are 30 "Yes-No" questions in the scale. In scoring, every answer in favor of depression is scored as 1 point while every answer against depression is scored as 0; the total score is taken as the depression score.

Functional Activities Questionnaire (FAQ)

The FAQ is a short questionnaire assessing the everyday life activities of elderly individuals (for example, paying bills, going shopping alone, and keeping financial accounts) (11). The questionnaire is usually answered by the respondents themselves; if a respondent is a patient it is answered by one of his first-degree relatives. Each performance related to 10

daily life activities is scored between 0 and 3. Scoring 15 or more points in the 60-69 age group for 2 or more activities and 9 or more points in the 70 years of age and older group for 3 or more activities indicates a disorder of functional activities, and that the elderly person is dependent on someone else. In a study to establish norms for the Turkish adaptation of the FAQ, carried out on a sample of Turkish people 50 years of age and above, it was found that age and education level had a significant effect on FAQ scores, while there was no effect of gender (12).

Beck Depression Inventory (BDI)

This 21-item scale was developed by Beck (13) to determine the level of depression. Reliability and validity studies on the Turkish adaptation was carried out by Hisli (14). In Turkish form of the BDI, it was found that a split-half reliability was 0.74 and a criterion validity coefficient was 0.63 (14). According to the scoring, 0-9 = minimal, 10-16 = mild, 17-29 = moderate, and 30-63 = severe depression. When breakpoint of the test was examined in the Turkish form of BDI, it was concluded that 17 and above points refer to depression treatment. This is because, the breakpoint of BDI in this research was accepted to be 17 and above points.

Verbal Materials Used in this Study

A list of 52 words, including 26 concrete (child, newspaper, etc.) and 26 abstract (faith, joy, etc.) words, selected from Turkish Word Norms (15), was used in the research. For the recognition test, a total of 208 prevalent words (for example, wonder-marvel-confused-hot) selected from Turkish Word Norms and consisting of two semantic and two sonic lures associated with each target word were used. The mean number of letter of all the words including lures in the recognition test used in the study was 7, ranging from 5 to 9; the mean number of syllable was 3, ranging from 2 to 4. The words that had average word frequency were chosen from Turkish Word Norms to be used in the research. In this line, all concrete and abstract words used in the research were equivalent to each other in every aspect.

Procedure

All subjects were tested individually. All words were presented with lower case letters in the 'Arial' font on a 33 X 21 cm computer screen. After each word was presented for 2 s, 'RRRRRR', for "remember" or 'FFFFFF', for "forget" appeared on the screen and was presented for 3 s. That is, the subjects were asked to keep some of the words in mind (recall), while not bearing others in mind (forget). After the research words were presented, half of them following the instruction 'remember' , the other half following the instruction 'forget', the participants were subjected to a free-recall task and, regardless of the instruction (remember or forget), they were asked to recall as many presented words as they could and write them on a blank sheet of paper. For this task, the participants were given 10 minutes. Next, they were given a recognition test in which the target words were presented with 4 distractor words (unstudied and semantically and phonologically associated with the target words). The subjects were asked to mark the words they believed they had studied. The experiment took approximately 1 hour.

Results

A 2 (age: young and older) x 2 (level of concreteness of the words: concrete and abstract) x 2 (instruction type: remember and forget) factorial ANOVA with repeated measures on the last factor was used for data analysis. The means, the standard deviations and percentages of abstract and concrete words correctly recalled and recognized with instructions of R or F are summarized in Table 2 and Table 3.

Recall

According to the results of the ANOVA, the main effects of age and instruction type on recall scores were significant

Table 2— Means, Standard Deviations and Percentages of Abstract and Concrete Words Correctly Recalled With Instructions of R or F

2X2X2	R WORDS		F WORDS	
N=96	Younger	Older	Younger	Older
Abstract	M=3.38 (%26) SD= 1.79	M=0.77 (%5.9) SD=	M=2.16 (%16.6) SD=1.6	M=0.8 (%6) SD=0.93
Concrete	M=2.58 (%19.8) SD=1.62	M=1.13 (%8.7) SD=0.88	M=1.54 (%11.85) SD=1.43	M=1.22 (%9.38) SD=1.17

Table 3— Means, Standard Deviations and Percentages of Abstract and Concrete Words Correctly Recognized With Instructions of R or F

2X2X2	R WORDS		F WORDS	
N=96	Younger	Older	Younger	Older
Abstract	M=6.62 (%51) SD=3.04	M=2.54 (%19.5) SD=1.8	M=5.32 (%41) SD=2.74	M=3.27 (%25) SD=2.17
Concrete	M=6.8 (%52.3) SD=2.9	M=4.17 (%32) SD=2.61	M=5.02 (%38.6) SD=2.9	M=3.89 (%30) SD=2.35

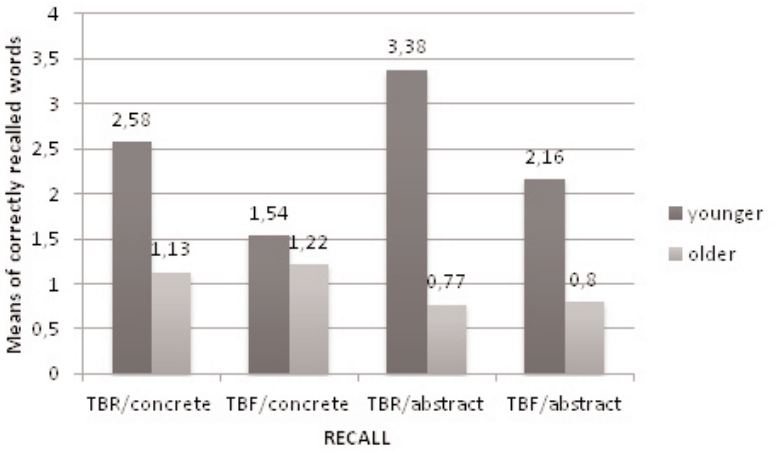


Figure 1— Means of correctly recalled words.

($F_{(1,94)}$=72.58, p<.001, η^2 = 0.44); $F_{(1,94)}$= 10.49, p<.01, η^2= 0.1). The main effect of level of concreteness was not significant ($F_{(1,94)}$ = 2.58, p>.001, η^2 =0.03). The interaction between age and concreteness level, ($F_{(1,94)}$ = 28.3, p <.001, η^2 =0.23) and the interaction between age and instruction type on recall scores, ($F_{(1,94)}$=12.71, p< .01, η^2=0.12) were found to be significant. In addition, the interaction between age, level of concreteness and instruction type was significant ($F_{(2.38, 223.63)}$= 13.56, p<.001, η^2=0.13) (Figure 1).

In addition, whereas any significant difference between total scores of R and F in older subjects, $\bar{x}$ =0.11, sd=0.34, p>.001 was not observed, a significant difference was found in younger participants, $\bar{x}$ =2.26, sd=0.56, p<.001.

Recognition

The main effects of age, instruction type and level of concreteness on recognition scores were found to be significant ($F_{(1,94)}$=34.64, p<.001, η^2= 0.27); $F_{(1,94)}$= 8.65, p<.01, η^2= 0.08; $F_{(1,94)}$ = 9.95, p<.01, η^2 =0.1, respectively). The interaction between of age and level of concreteness ($F_{(1,94)}$ = 11.46, p <.01, η^2=0.11) and the interaction between age and instruction type on recognition scores ($F_{(1,94)}$=15.28, p< .001, η^2=0.14) were found to be significant. Furthermore, the interaction between age, level of concreteness and instruction type was significant ($F_{(2.63,246.95)}$= 10.63, p<.001, η^2=0.1) (Figure 2).

In addition, a significant difference was found in younger participants, $\bar{x}$ =3.08, sd=0.71, p<.001, while it was not observed in older participants, $\bar{x}$ =0.44, sd=0.53, p>.001.

The pairwise comparisons of the recall and recognition scores are summarized in Table 4.

Discussion

According to the results of the study, as expected, younger participants showed the directed forgetting effect by remembering more numbers of TBR items in recall and recognition, while older participants retrieved more TBF items compared to TBR items, though the difference between the scores of them was minimal. These results are consistent with the results of Zacks et al. (4) and therefore with age-related inhibition deficit theory. Accordingly, because elderly

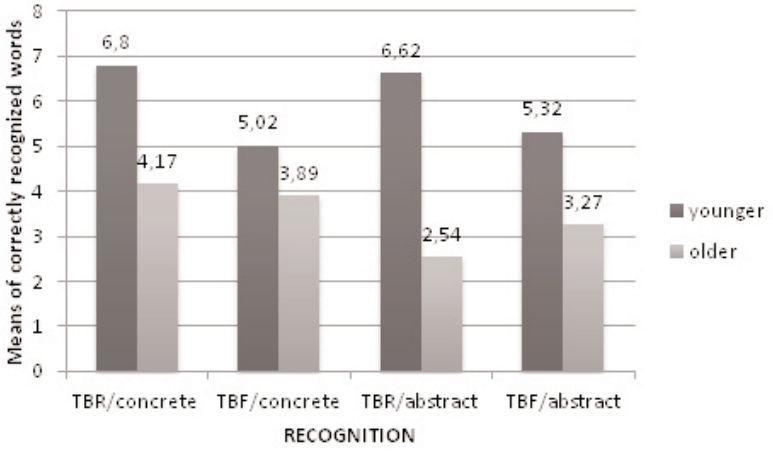


Figure 2— Means of correctly recognized words.

people have inefficient inhibition mechanisms and fail to supress irrelevant information, they recall more TBF items (16,4). Correspondingly, Hartman and Hasher (17) suggested that elderly people were more likely to have unexpected endings of sentences still available in memory, even if the information was identified as irrelevant.

In the present study, the low TBR performance of the older subjects in recall and recognition compared to the younger subjects can be explained by the results of previous research suggesting that explicit memory declines with aging (18,19).

When the memory performance of the younger and older people was compared in terms of abstract and concrete words, it was observed that the younger people retrieved more abstract and concrete words in recall and recognition in total (both TBR and TBF words). On the other hand, when the total number of words (both TBR and TBF words) retrieved by older people was considered, it was seen that the number of concrete words was greater than the number of abstract words. This situation was different in the younger participants. When the total number of words they retrieved was examined, though the number of abstract words was greater than the number of concrete ones in recall, no significant difference between two types of words was found in recognition. While the explicit memory performance of elderly individuals is thought to be outpaced by younger people, it is an expected finding that the number of both concrete and abstract words the young subjects recalled or recognised was greater than the number of words the older participants recalled or recognized. Viewed from this perspective, it can be concluded that the older people retrieved more concrete words in recall and recognition by showing a "concreteness effect", while the young participants remembered more abstract words only in recall (not recognition) by exhibiting an "abstractness effect".

Xiao, Zhao, Zhang and Guo (6), in their study of ERP measurements with adults 18-23 years of age, observed that the subjects showed a concreteness effect by responding to TBR concrete words faster and more accurately than to abstract words in explicit memory. There is consistency between this research and the present study. Xiao et al. administered a recognition task, asking subjects to make decisions about new/old about items previously presented using ERP, while the participants in the present study were asked to remember and then to recognise the words. When the recognition results were examined in the current study, although no significant difference was found between concrete and abstract words in the TBR condition (not in TBF) for the younger subjects, that did recognise more concrete words (abstract words mean: 6.62, concrete words mean: 6.8). In this context, these two research results support each other. The results are supported by some research related to the dominance of concrete words over abstract words in recognition in the literature (20,21).

The present study has corresponding results as well as different aspects with the research cited above (2,4,5). Like the general results of these studies, it was found that older people retrieved more TBF items in recall and recognition tasks (with very little difference between TBR and TBF items) because of impaired inhibition mechanism. In the present

Table 4— Pairwise Comparisons Summary Table of Recall and Recognition Scores

Main and Interaction Effects	$\bar{x}$ (SD) RECALL	Comparisons
Age	$\bar{x}$ =1.44, sd=0.17, p<.001***	younger > older
Age * Level of Concreteness	$\bar{x}$ =4.02, sd=0.4, p<.001***	younger > older (abstract)
	$\bar{x}$ =1.77, sd=0.4, p<.001***	younger > older (concrete)
	$\bar{x}$ = 0.78, sd=0.25, p<.01**	concrete > abstract (older)
	$\bar{x}$ = 1.46, sd=0.34, p<.001***	abstract > concrete (younger)
Instruction Type	$\bar{x}$ =1.08, sd=0.33, p<.01**	recall > forget
Age * Instruction Type	$\bar{x}$ =4.07, sd=0.49, p<.001***	younger >older (recall)
	$\bar{x}$ =1.7, sd=0.46, p<.001***	younger >older (forget)
	$\bar{x}$ = 0.11, sd=0.34, p=0.75	NS (older)
	$\bar{x}$ =2.26, sd=0.56, p<.001***	recall> forget (younger)
Age*LC*IT	$\bar{x}$ =1.36, sd=0.27, p<.001***	younger>older (abstract/forget)
	$\bar{x}$ =1.45, sd=0.27, p<.001***	younger >older (concrete/recall)
	$\bar{x}$ =2.62, sd=0.3, p<.001***	younger >older (abstract/recall)
	$\bar{x}$ =0.32, sd=0.27, p= 0.23	NS (concrete/forget)
Main and Interaction Effects	**$\bar{x}$ (SD) RECOGNITION**	**Comparisons**
Age	$\bar{x}$ =2.47, sd=0.42, p<.001***	younger > older
Age * Level of Concreteness	$\bar{x}$ =5.78, sd=0.91, p<.001***	younger > older (abstract)
	$\bar{x}$ =3.44, sd=0.91, p<.001***	younger > older (concrete)
	$\bar{x}$ = 2.26, sd=0.54, p<.001***	concrete > abstract (older)
	$\bar{x}$ = 0.08, sd=0.44, p=0.86	NS (younger)
Instruction Type	$\bar{x}$ =1.32, sd=0.45, p<.01**	recall > forget
Age *Instruction Type	$\bar{x}$ =6.7, sd=0.96, p<.001***	younger >older (recall)
	$\bar{x}$ =3.19, sd=0.94, p<.01**	younger >older (forget)
	$\bar{x}$ = 0.44, ss=0.53, p=0.42	NS (older)
	$\bar{x}$ =3.08, ss=0.71, p<.001***	recall> forget (younger)
Age*LC*IT	$\bar{x}$ =2.06, sd=0.51, p<.001***	younger>older (abstract/forget)
	$\bar{x}$ =2.63, sd=0.57, p<.001***	younger>older (concrete/recall)
	$\bar{x}$ =4.08, sd=0.52, p<.001***	younger>older (abstract/recall)
	$\bar{x}$ =1.13, sd=0.54, p<.05*	younger>older (concrete/forget)

*p<.05; **p<.01; ***p<.001
(non-significant: NS)

study, it appeared that while older people tend to recalled more numbers of TBF concrete materials and failed to forget, the young individuals had tendency to recall more numbers of TBR abstract words than concrete ones. In recognition, both younger and older subjects retrieved more numbers of concrete words. These results indicate that processes in DF differently emerges according to features of memory materials, procedure and developmental periods. In this sense, the results coming from the present study contribute to the literature. The current research also supports the results of Zacks et

al.(4), Sego et al.(5) and Aguirre et al. (2) in that age differences in DF depend on executive control required by task.

Unlike the results of both research (4,5), it was not found DF effect for older participants although the difference TBR and TBF words was minimal in the current study. Zacks et al.(4) showed that older subjects retrieved more TBF items in comparison with younger ones but older participants also indicate DF effect. Sego et al. (5) observed this effect for older and younger participants in both recall and recognition tasks in the item-by-item method and only in recall in the list procedure. On the other side, Aguirre et al.(2) did not obtain any evidence about SDF effect for older participants. Because SDF task requires more executive control than standard DF tasks, older participants did not show any SDF.

In the present study, some reasons can be cited about that younger subjects showed DF effect but not elderly participants. Firstly, while in the other research 40 words (4) or 24 words (5) were presented to study more numbers of items (56 words) were used to study in the current study. Secondly, unlike other research both abstract and concrete words in lieu of unrelated words were employed in the present study. For these reasons, the procedure of the present study might result in more executive memory demand for older people by increasing load of memory. It can be concluded that when task demands change results in DF change along with it, and DF effect is not an effect that can be observed in all conditions for older people.

With respect to this topic, it was interesting that when the TBF items that elderly subjects retrieved in both recall and recognition were examined, it was observed that although there was no statistically significant difference between them, the number of TBF abstract words retrieved was greater than the number of TBF concrete ones. In fact, this difference was higher for recognition scores. If this finding is explored in future research in which participants are fully synchronized in terms of level of education (all subjects are high school or university graduates) and IQ level this should lead to reliable results. On the other side, in contrast to our hypothesis, though difference was very minimal the elderly participants showed less DF effect for concrete words in recall but just the opposite in recognition.

Another important issue to be mentioned that there are some research that failed to find decreased forgetting effect in older adults less than 75 years of age in list method (22,23). For this reason, in research related to DF that will be carried out in the future older participants should be divided to two groups as above or under 75 and DF processes should be taken considerations in terms of these groups. Such research might give more accurate information about DF in elderly people.

In this study, the failure to include every educational level of the participants due to limited access to healthy and literate older participants can be considered a limitation of the research. We attempted to deal with this limitation by equating the older group's average years of education with that of the younger group.

On the other hand, we suggest that this research is important in understanding and assessing mental processes, and therefore in planning required services and applications for healthy and high quality aging.

In sum, it was concluded that in directed forgetting with abstract/concrete words, younger participants showed an abstractness effect only in the recall task (not in recognition), while elderly participants displayed a concreteness effect in both the recall and recognition tasks. Thus, the mind that tends to retrieve abstract material in youth evolves to retrieve more concrete material with aging. Thus, it might be suggested that memory develops from concrete to abstract in childhood, again returns to its some concrete characteristics with aging. In addition, with aging, people tend to process more TBF items, considered irrelevant information, through the disruption of the inhibition mechanism.

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Turkish Journal of Geriatrics
2014; 17 (3) 299-304

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RESEARCH

THE EFFECTS OF BEHAVIOR TYPE AND ANGER PARAMETERS ON HEARING AID SATISFACTION IN HEARING AID USERS

ABSTRACT

Introduction: Hearing loss is a very common disorder in the elderly population. The purposes of this study were to compare scores on the International Outcome Inventory for Hearing Aids in subjects with hearing aids under and over the age of 65, and also to examine the effect of Type A behavior and anger profile on International Outcome Inventory for Hearing Aids scores in older adults.

Materials and Method: In this study there were two groups, consisting of 64 subjects between the ages of 40 to 85, fitted with hearing aids. The first group (Group I) included subjects aged >65 and the second group (Group II) included subjects aged 65. To determine behavior types and anger parameters, all subjects in both groups were evaluated on the Escala Retiro de Patron de Conducta Tipo A scale and State-Trait Anger Expression Inventory. Satisfaction with hearing aid was evaluated using the International Outcome Inventory for Hearing Aids questionnaire. Behavior types, anger parameters and satisfaction with hearing aid were compared statistically.

Results: Averages of International Outcome Inventory for Hearing Aids scores for Group I and Group II were 28.8±5.6 and 29.0±6.6, respectively. 56% of subjects in Group I and 53% of subjects in Group II had type B behavior. International Outcome Inventory for Hearing Aids, behavior types and anger parameters were analyzed between the two groups, and no statistically significant relation was found (p>0.05).

Conclusion: According to this study, the types of behavior and/or aging have no significant effect on hearing aid satisfaction.

Key Words: Aging, Hearing Loss; Hearing Aid, Anger, Behavior.

ARAŞTIRMA

DAVRANIŞ TİPİ VE ÖFKE PARAMETRELERİNİN İŞİTME CİHAZI KULLANANLARDA İŞİTME CİHAZI MEMNUNİYETİ ÜZERİNE ETKİLERİ

ÖZ

Giriş: İşitme kaybı, yaşlı popülasyonda oldukça yaygın bir rahatsızlıktır. Bu çalışmanın amaçları, 65 yaş altı ve üzeri işitme cihazı kullanan kişilerde 'Uluslararası İşitme Cihazı Değerlendirme Envanteri' puanlarının karşılaştırılması ve aynı zamanda Tip A davranışın ve öfke profilinin işitme cihazı memnuniyeti üzerine etkisinin değerlendirilmesi idi.

Gereç Yöntem: Çalışmada, 40 ile 85 yaş arası işitme cihazı kullanıcısı 64 bireyden oluşan iki grup yer aldı. İlk grup (Grup I) 65 yaş üzerindeki bireylerden, ikinci grup (Grup II) 65 yaş ve altındaki bireylerden oluşmaktaydı. Davranış tipleri ve öfke parametrelerinin belirlenmesi için her iki grupta yer alan tüm bireyler 'Escala Retiro de Patron de Conducto Tipo A' skalası ve 'Sürekli Öfke İfadesi Envanteri' ile değerlendirildi. İşitme cihazı memnuniyeti ise 'Uluslararası İşitme Cihazı Değerlendirme Envanteri' ile değerlendirildi. Davranış tipleri, öfke parametreleri ve işitme cihazın memnuniyeti istatistiksel olarak karşılaştırıldı.

Bulgular: Grup I ve Grup II'de 'Uluslararası İşitme Cihazı Değerlendirme Envanteri' skor ortalamaları 28.8±5.6 ve 29.0±6.6 idi. Grup I'deki bireylerin %56'sı, Grup II'deki bireylerin %53'ü tip B davranışa sahipti. 'Uluslararası İşitme Cihazı Değerlendirme Envanteri', davranış tipleri ve öfke parametreleri her iki grupta analiz edildi ve istatistiksel olarak anlamlı bir ilişkinin olmadığı saptandı (p>0.05).

Sonuç: Bu çalışmaya göre, davranış tipi ve/veya yaşlanmanın işitme cihazı memnuniyeti üzerine anlamlı bir etkisi yoktur.

Anahtar Sözcükler: Yaşlanma; İşitme Kaybı, İşitme Cihazı; Öfke, Davranış.

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Geliş Tarihi: 23/05/2014
(Received)

Kabul Tarihi: 24/06/2014
(Accepted)

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Introduction

Hearing loss related to presbycusis is a common problem the in elderly population. Age-related hearing features are characterized by slowed central processing of acoustic information, reduced hearing sensitivity and speech comprehension in noisy environments, and disordered localization of sound sources (1). Most alterations in auditory system initially begin in young adulthood, but geriatric hearing impairment becomes evident at age 60 or older and continues during the seventh decade (2-4).

Left untreated, hearing loss can lead to reduced quality of verbal communication and some psychological problems such as anxiety, depression, social isolation, behavior disorders and sleeping problems (5-7). Hearing aid rehabilitation is the mainstay of treatment for people with age-related sensorineural hearing loss. Also, rehabilitation with hearing aids is one of the important factors reducing stress and anxiety levels (6). Difficulties in conversation because of hearing loss are perceived as a barrier by people. Types of behavior in subjects with hearing loss may directly affect this process. The most accepted classification of behavior types is Type A and Type B personality theory. Many authors have reported that people with Type A behavior have a higher risk for health problems. Type A behavior includes aggressiveness, competitiveness, irritability, work orientation, worrying about deadlines, urgency, etc. (8-10). Anger is one of the essential parameters of Type A personality (6,11,12). In hearing aid rehabilitation programs, some questionnaires such as the IOI-HA are useful tools to evaluate hearing aid satisfaction (13).

There are many published studies about type of behavior and anger profiles in various pathologies, such as 'hearing loss and depressive symptoms in elderly' (6,10,14). According to our knowledge there is no study comparing type of behavior, anger profile and satisfaction of hearing aid in elderly subjects. Furthermore, there are scarcely any studies comparing the hearing aid satisfaction using the IOI-HA –TR in subjects under and over the age of 65 in Turkey. Kirkim et all stated for those of patients with hearing loss, only 30 out of 98 patients accepted to wear a hearing aid (4). When hearing impaired elderly patients were not fitted with hearing aids they could not overcome verbal communication problems so to face inevitable unpleasant feeling of having misunderstood the content of a conversation. This condition may lead social isolation for some of the elderly patients. Adaptation and counseling after each fitting hearing aid is far more crucial especially for the elderly population (4). Thus, quality of life as well as emotional problems of hearing impaired elderly patients may be improved when their problems with verbal communication skills solved. The purpose of this study was twofold:

To examine the score of IOI-HA-TR in subjects under and over the age of 65 fitted with hearing aids.

To compare the impact of Type A behavior with the ERCTA scale and Anger Inventory on the International Outcome Inventory for Hearing Aids (IOI-HA) scores in older adults under and over the age of 65 fitted with hearing aids.

Materials and Method

In this study, a total of 64 patients with hearing aids, aged 40 to 85, were enrolled. Participants were divided into two groups, Group I and Group II. Group I included subjects aged >65, and Group II included subjects aged ≤65. For each subject, ear, nose and throat examinations were normal. One inclusion criterion was use of a hearing aid for at least 6 months (mean time of use: 3.7 years). Acoustic immittance, transient-evoked otoacoustic emission testing, pure tone audiometry, and speech audiometry results were analyzed. All subjects of both groups completed the ERCTA-TR (Escala Retiro de Patron de Conducto Tipo A- Turkish Version), STAXI-TR Anger Inventory (State-Trait Anger Expression Inventory Turkish Version) and IOI-HA-TR (International Outcome Inventory for Hearing Aids- Turkish Version). The protocol of this study was approved by the Local Ethical Committee with protocol number 937-GOA (04/11/2013) and all participants provided written, informed consent.

Turkish Version of International Outcome Inventory for Hearing Aids (IOI-HA-TR)

IOI-HA-TR (15) scores of the two groups were evaluated. IOI-HA was developed for use in research settings to facilitate cooperation among researchers in different hearing healthcare settings. A rating of 1-5 is assigned to each of the seven questions, total scores from 1 to 35, with higher ratings indicating greater satisfaction-benefit (13). The inventory, which was originally produced in English, has been translated into more than 20 languages (16) and is widely used in hearing aid rehabilitation programs (17).

ERCTA-TR Scale

Turkish Version of the ERCTA Scale was used to assign subjects to one of three groups, based on behavior type (14). This

Table 1— Audiological Data of The Aided Ear in Group I (>65 years) and II (≤65 years)

	Group I (>65 years mean and standard deviation)	Group II (≤65 years mean and wstandard deviation)
Average pure tone thresholds at 0.5, 1 and 2kHz (dB HL)	49.18±11.3	49.1±12.5
Average pure tone thresholds at 1, 2 and 4 kHz (dB HL)	55.9± 10.7	56.4±12.5
Speech perception threshold (dB HL)	57.7±12.3	56.3±13.9
Speech discrimination score (%)	67.8±18.6	68.5±18.0

Table 2— Percentage Scores of Behavior Types, Total Anger Index (STAXI-TR) and IOI-HA-TR

	Behavior type according to the ERCTA scale (Type HighA : 27-40 , Type A: 22-26 , Type B 8-21 point)						STAXI score	IOI-HA-TR score
	Type High A		Type A		Type B			
	Percent of patient (%) (Number)	Mean±SD	Percent of patient (%) (Number)	Mean±SD	Percent of patient (%) (Number)	Mean±SD		
Group I (>65 years)	6% (2)	28.0±1.4	38% (13)	23.5±1.4	56% (19)	19.0±2.4	31.29±12.47	28.8±5.6
Group II (≤65 years)	3% (1)	27.0	44% (13)	24.0±1.7	53% (16)	19.2±1.6	3 6.40±10.11	29.0±6.6

questionnaire is composed of eight items with a 5-point response scale (10). Participants were divided into three subgroups as Type A, Type higher A and Type B personalities according to ERCTA scores. A score of higher than 26 on the ERCTA scale is considered to be indicative of a higher type A personality. A score of 22 to 26 is considered to be indicative of a type A, and lower than 22 is considered as a type B.

STAXI-TR Scale

The Turkish Version of the STAXI Scale was used for the assessment of anger in Groups I and II. (14,18). This scale evaluated the intensity of anger as an emotional state at a particular time. This psychometric tool evaluates anger isolated from hostility and aggression, covering the anger's experience and expression. "Five of the subscales from the STAXI were used to measure the experience and expression/control of anger. The 10-item trait anger scale (T-Ang) assesses one's propensity to experience anger. Likert-type items (1= "not at all" to 4= "always") yield total scores from 10 to 40, with higher scores representing higher levels of trait anger. The four 8-item anger expression and control scales were also used to evaluate anger expression-in (AX-I), anger expression-out (AX-O), anger control in (AC-I), and anger control out (AC-O). AX-I measures unhealthy anger suppression, while AX-O shows aggressive anger expression. AC-I evaluates the control of angry feelings by relaxing and cooling off, and AC-O describes the control of anger by not expressing it towards other people or objects. The 10-item state anger scale (S-Ang) measures intensity of angry feeling.

Statistical Analyses

All statistical analyses were performed using SPSS version 15.0. Data from Groups I and II were analyzed using descriptive statistics. The significance of the difference between these groups was analyzed using the Mann-Whitney U test and Kruskal-Wallis variance analyses. The level of significance in all tests was set at a p value of less than 0.05.

RESULTS

The total sample was composed of 64 subjects in two groups. Group I consisted of 34 subjects (23 males, 11 females) with a mean age of 73.8±5.5 (min 66 years- max 85 years). The second group (Group II) consisted of 30 subjects

(17 males, 13 females) with a mean age of 51.5±10.8 (min 40 years- max 65 years).

Of those subjects, 35 had high frequency hearing loss, and 29 had other various types of hearing impairments. Audiogram configurations of Group I and II were similar to each other. No statistical difference in audiological data of aided ears for Group I and II was found (p>0.05) (Table1). The average IOI-HA-TR scores for Group I and Group II were 28.8±5.6, 29.0±6.6, respectively (Table 2). These results are correlated with high satisfaction, probably related to use of a hearing aid.

Anger parameters and type of behavior obtained from subjects in Group I were compared to those of Group II. 56 % of subjects in Group I and 53 % of subjects in Group II had type B behavior (Table 2). Averages of S-ANG, T-ANG and AX-Index scores in Group II were higher than scores in Group I (Figure 1). Types of behavior, Anger parameters and IOI-HA-TR scores were compared with one another, and no statistically significant differences were found (p>0.05).

Discussion

Age related hearing loss or presbycusis, the most common type of hearing loss in older adults, is a multifactorial sensorineural loss that frequently includes a component of impaired speech discrimination. Presbycusis leads to adverse effects on the cognitive, emotional, behavioral and social function of older adults (7). Residual hearing should be optimized by using hearing aids in the elderly. Thus, their quality of life will be better than before. Some sources have indicated that untreated elderly with hearing loss often suffer from feelings of sadness, anxiety, depression, insecurity and social isolation (6). It has been shown that audiological rehabilitation improved environmental interaction as well as patients' emotional and social profiles (1,6). There are some studies examining the relationship between various diseases such as coronary heart disease and the feature of behavior-anger parameters (9,10,14). Other investigations concern the use hearing aids and satisfaction inventories (15,17,19). However, there is no published study about the effects of the feature of behavior and anger parameters on hearing aid satisfaction.

In this study, we investigated whether there is an effect of behavior type and anger parameters on the satisfaction of subjects fitted with hearing aids. Thus, Type A behavior and Anger Profile scores were compared with IOI-HA scores obtained from subjects over and under 65 years of age. Since the World Health Organization (WHO) describes people aged over 65 as old, the subjects in this study were separated into two groups: ages 40 to 65, and those over 65 (20).

People with decreased speech comprehension ability related to hearing loss perceive this situation as a handicap (10). It could be expected that these people may exhibit Type A behavior features and anger reactions. In our study, Type A and Type B behavior rates in Group I were 38% and 56%, respectively. In Group II, the rates of Type A and Type B were 44% and 53%, respectively (Table 2). It was remarkable

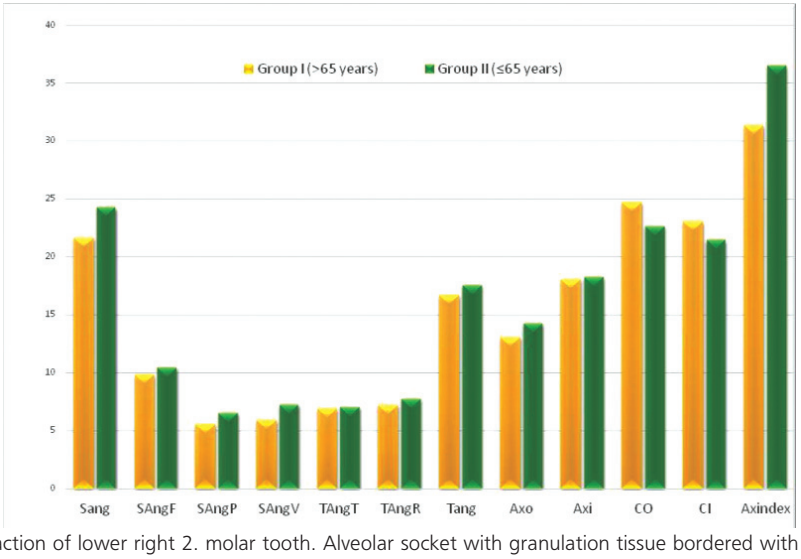


Figure 1— After the extraction of lower right 2. molar tooth. Alveolar socket with granulation tissue bordered with infected alveolar bone.

that more than half of the patients had type B behavior in both groups. In the literature, it has been pointed out that the possibility of separating individuals into two groups as ''Type A'' or ''Type B'' is not possible, and individuals may not show all of the properties of the behavior types. Furthermore, single behavior features that individuals show have no meaning and value (21). Hariri et al. stated that physical illness is a kind of chronic stress that can cause an emotional response by disrupting the balance of the person's life. Interactions between the disease and the psychosocial environment of the person have identified the type and severity of emotional response. Consequently, behavior and responses to disease symptoms may vary depending on "how the person perceives the disease", and "to what extent the person accepts the disease" (22). The present study reflect these findings from the literature, in that the patients with type A behavior characteristics have adapted to the use of a hearing aid and have higher satisfaction with their hearing aid. It should be pointed out that the study groups accepting the rehabilitation program with hearing aids were mostly made ??up of individuals exhibiting behavior characteristics of type B.

To our knowledge, this is the first study investigating possible associations among behavior pattern, anger inventory and International Outcome Inventory for Hearing Aids with elderly subjects. Study groups were similar in terms of parameters of audiological data, sex, type of behavior and anger. The only difference between the groups was "age". In the light of the results, it was concluded that being over age of 65 has no negative effect on hearing aid satisfaction. Kahveci et al. concluded that aging may have a negative effect on regular use of hearing aids and patient satisfaction (23). In this study only patients who had regularly used hearing aids for at least 6 months were included. The Kahveci et al. study results cannot be compared with our results regarding the use of hearing aids. In our study, hearing aid satisfaction was found to be similar between the people aged over 65, who are referred to as old according to the World Health Organization, and those aged under 65.

Conclusion

It was concluded that two factors leading to similarity between the two age groups are: the type B behavior rate, which is over than 50% in both groups, and rehabilitation of the patients with proper hearing aids. It is expected that proper rehabilitation with hearing aids, regular ear, nose, throat as well as audiological examinations, and further consultations, will positively affect hearing aid satisfaction. It is well known that properly fitted hearing aids can successfully reduce the social, emotional, and functional handicap resulting from hearing impairment in elderly patients. Thus, especially in the elderly, audiologic evaluation and hearing aid fitting should be performed by a skilled audiologist. Furthermore, counseling after each fitting is crucial. In rehabilitation with hearing aid, elderly people need to be well informed about how to improve their verbal communication skills such that the speaker should talk face-to-face with the listener, speak clearly, turn off noise sources (TV, radio). Thus, elderly people can be encouraged to wear hearing aid to overcome verbal communication problems. By providing that type of care, otolaryngologists and audiologists can improve the quality of life of elderly patients with well fitted hearing aids.

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Turkish Journal of Geriatrics
2014; 17 (3) 305-307

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Case Report

RS3PE WITH PROSTATE ADENOCARCINOMA

Abstract

Relapsing seronegative symmetrical synovitis with pitting edema (RS3PE) is a clinical syndrome characterized by acute onset of symmetrical joint involvement with pitting edema of the hands and feet. The etiology and pathogenesis of RS3PE is still unknown, though environmental and infectious agents may play a role in its development. RS3PE might be associated with rheumatologic diseases; while coexistence of RS3PE with neoplasms is also reported. Prognosis of RS3PE is good, with high response to low dose corticosteroids. A 72 year old man, who also suffers from prostate adenocarcinoma, with RS3PE syndrome is reported. He had no symptoms of prostatism or systemic symptoms. Adenocarcinoma was detected during the investigation for a possible coexisting malignancy. He responded well to the steroid treatment. Aged patients diagnosed with RS3PE syndrome should be carefully investigated for coexistence with neoplasms and followed for a future malignant process. Low dose corticosteroids should be initiated in all patients, together with the appropriate treatment for the malignancy in patients with neoplastic RS3PE.

Key Words: Aged; Prostate; Synovitis.

Olgu Sunumu

PROSTAT ADENOKARSİNOM TANISI ALAN BİR RS3PE OLGUSU

Öz

Tekrarlayıcı seronegatif pitting ödemli simetrik sinovit sendromu (RS3PE), ani başlangıçlı, eller ve ayaklarda gode bırakan ödem ile karakterize bir klinik sendromdur. RS3PE sendromunun etyolojisi ve patogenezi hala bilinmemektedir ancak gelişiminde çevresel ve enfeksiyöz ajanlar rol alıyor olabilir. RS3PE romatolojik hastalıklarla ilişkili olabilir ayrıca, neoplazilerle birlikteliği de rapor edilmiştir. RS3PE sendromu düşük doz kortikosteroide iyi yanıt veren, prognozu iyi bir sendromdur. Bu makalede 72 yaşında prostat adenokarsinom tanısı alan RS3PE sendromlu bir hasta sunulmaktadır. Herhangi bir prostatizm ve sistemik semptomu olmayan hastanın malignensi ile birlikteliği ihtimali için yapılan ileri araştırmasında prostat adenokarsinom tanısı tespit edilmiştir. Hasta steroide iyi yanıt vermiştir. RS3PE sendromu tanısı alan yaşlı hastalar malignensi birlikteliği ya da bu sendromu takiben çıkabilecek neoplazi açısından dikkatlice değerlendirilmelidir. Neoplastik RS3PE hastalarında düşük doz kortikosteroid tedavisi altta yatan neoplazinin tedavisi ile birlikte başlanmalıdır.

Anahtar Sözcükler: Prostat, Sinovit, Yaşlı.

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Geliş Tarihi: 07/04/2014
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Introduction

Relapsing seronegative symmetrical synovitis with pitting edema (RS3PE) is a clinical syndrome characterized by acute onset symmetrical joint involvement with pitting edema of the hands and feet, first described by McCarty in 1985 (1). It is especially reported in men over 60 years of age. The etiology and pathogenesis of RS3PE are still unknown. Neither rheumatoid factor (RF) nor antinuclear antibodies (ANA) is positive (2). The prognosis is good; RS3PE generally responds to low dose corticosteroid treatment, and complete remission is reported within 18 months. RS3PE may coexist with or precede a malignant state. We report a 72-year-old man with RS3PE syndrome diagnosed with prostate adenocarcinoma during the investigation for a possible coexisting malignancy.

Case

A 72-year-old male was admitted to the outpatient clinic with a 2-week history of bilateral painful swollen hands and feet. He reported morning stiffness lasting for half an hour. There was no history of trauma, fever, weight loss or any other metabolic or rheumatologic disease. He had smoked 30 cigarettes a day for 48 years between the ages 20 and 68.

On physical examination, there was pitting edema on the dorsum of the hands and feet bilaterally (Figure1). Range of motion of wrists, ankles and metacarpophalangeal and interphalengeal joints of the hands and feet were limited and painful in all directions. Routine laboratory investigation was as normal except for mild microcytic anemia (hemoglobin:11.1 g/dL Mid Corpuscular Volume:76.4) and elevated erythrocyte sedimentation rate (ESR) (83 mm/h) and C reactive protein (CRP) (6.66 mg/dl). RF and anti-cyclic citrullinated peptide (anti-CCP) were negative. Plain radiographs of the hands and feet showed soft tissue swelling but no evidence of articular erosions. A chest radiograph revealed no abnormality. Clinical impression was RS3PE and 5 mg prednisolone/day was started. We commenced further evaluation in order to rule out coexisting malignancy or rheumatologic disorder. ANA, HLAB27 and anti-ds-DNA were negative. Serum electrolyte levels, kidney, liver and thyroid function tests were within normal limits. Prostate specific antigen (PSA) was elevated: 72.25 ng/ml (0-4 ng/ml).

The patient was consulted to Urology Department. Prostate biopsy revealed prostatic adenocarcinoma with a Gleason score of 4. The patient refused the operation so radiotherapy was given for the treatment of prostatic adenocarcinoma. One month later his symptoms regressed completely. The edema had almost disappeared within ten days (Figure 2) and ESR was markedly decreased at the first month. At third month follow up he had no signs or symptoms of RS3PE. The patient continued to take prednisolone treatment for 6 months. At first year follow up there was no recurrence.

A typical patient with RS3PE fulfills the following criteria: (1) bilateral pitting edema of the hands, feet or both, (2) sudden onset of polyarthritis, (3) age over 50 years, and (4) seronegativity for RF. RS3PE was described by McCarty in 1985 for the first time in eight aged men and two aged women with symmetric polysynovitis with acute onset. He found no evidence of erosions on radiographs. Serologic tests such as RF, antiCCP, and ANA were negative (1). The HLA-B7 phenotype is reported to be positive in patients with



Figure 1— Before treatment.



Figure 2— After treatment.

RS3PE syndrome (1, 2, 5); however, HLA-B7 assay was not possible in our case. A proportion of RS3PE patients are associated with or develop features of rheumatic diseases like rheumatoid arthritis, spondyloarthropathy or connective tissue diseases (2).

In RS3PE syndrome, ESR is moderately high at the time of diagnosis but falls after treatment, which presumably indicates an inflammatory process. The etiology of RS3PE syndrome is still unclear; an infectious agent is presumed to be the triggering factor but none has been confirmed (5). RS3PE syndrome has also been described in neoplastic conditions. The first observation was RS3PE appearing 4 months before a non-Hodgkin's lymphoma (3). Since then solid tumors such as colon, gastric, breast, prostate and hematological malignancies (4-9) have been reported. Coexistence of RS3PE and malignancies gave rise to the thought that it might be a paraneoplastic syndrome. Review of the literature indicates that RS3PE syndrome may coexist with or precede a malignant state (10). Concerning the reports about RS3PE syndrome being associated with malignancies, some patients have constitutional symptoms with a deterioration in general health (3), whereas others have no difference from the classical clinical scene of RS3PE (5,11). Our patient had no symptoms other than the edema and arthritis of the hands and feet. Further, he had no symptoms of prostatism. Systemic symptoms in patients having RS3PE syndrome should alert the clinician about coexisting malignancies. Furthermore, patients diagnosed with RS3PE syndrome in whom any underlying pathology was not detected should be followed for a future malignant process (11).

Another issue with neoplastic RS3PE syndrome is the response to corticosteroids. Patients with idiopathic RS3PE show a good response to low dose corticosteroids (12). There are reports of a poor response of RS3PE patients with associated neoplasia (3,6). Good response to corticosteroids, similar to the idiopathic cases, is also reported in neoplastic RS3PE syndrome (5,11). The best management of paraneoplastic RS3PE syndrome is to treat the malignant process; most patients seem to respond after successful treatment of the underlying malignancy after surgical treatment of the tumour and/or chemotherapy or radiotherapy (4-6). Our patient responded to low dose steroid treatment in a short time; clinical and laboratory findings were normalized at the first month without any relapse.

Conclusion

Patients diagnosed with RS3PE syndrome should be carefully investigated for a possible neoplasm and followed for a future malignant process. Systemic symptoms and inadequate response to glucocorticoids should alert the physician about a coexisting malignancy. Prostate adenocarcinoma should be kept in mind in aged men with RS3PE syndrome,even in the absence of symptoms of prostatism.

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Turkish Journal of Geriatrics
2014; 17 (3) 308-311

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Case Report

APPLICATION OF FREE FLAP IN AN ELDERLY PATIENT

Abstract

The incidence of skin cancers is increasing parallel to other cancers, with a growing elderly population. Surgery continues to be the gold standard, although many other therapeutic methods are available for the treatment of skin cancers. In surgical treatment, all steps of reconstructive surgery can be employed, and the method to be selected should yield satisfactory cosmetic and functional outcomes. Free flaps are at the very top of the reconstructive steps, due to prolonged operation time and the necessity of employing a specific technique. On the other hand, free flaps are the first line of treatment in certain cases where cosmetic and functional concerns prevail. In elderly patients, however, free flaps are often not preferred due to prolonged operation time. The current case report presents a 96-year-old female patient who was admitted to our clinic due to squamous cell carcinoma and who subsequently underwent reconstruction using a free radial forearm skin flap. Examples from the literature were highlighted in which proper patient management in the preoperative, intraoperative, and postoperative period will produce fewer concerns regarding free flap surgery in the elderly population.

Key Words: Aged; Skin Neoplasms; Free Tissue Flaps.

Olgu Sunumu

İLERİ YAŞ HASTADA SERBEST FLEP UYGULAMASI

Öz

Günümüzde artan yaşlı popülasyonda diğer kanserlerle birlikte cilt kanseri insidansı da artmıştır. Cilt kanserlerinde birçok tedavi yöntemi bulunmakla birlikte cerrahi tedavi altın standarttır. Cerrahi tedavide seçilecek yöntemler arasında rekonstrüktif basamağın her adımı uygulanabilir ve seçilecek yöntemin estetik ve fonksiyonel sonuçları tatmin edici olmalıdır. Uzun operasyon zamanına ve spesifik bir tekniğe ihtiyaç duyması nedeniyle serbest flepler rekonstrüktif basamağın en tepesinde yer alır. Estetik ve fonksiyonel kaygılar göz önüne alındığında ise bazı olgularda serbest flepler cerrahi tedavide ilk sırada tercih edilir. İleri yaş hastalarda ise serbest flepler uzun operasyon süresi gerektirdiği için genellikle tercih edilmez. Bu yazıda, skuamoz hücreli karsinom tanısıyla kliniğimize başvurun 96 yaşındaki bayan hastanın tümör eksizyonu sonrası serbest radial ön kol flebi ile rekonstrüksiyonu sunulmuş ve preoperatif, intraoperatif ve postoperatif uygun hasta yönetimi ile, ileri yaştaki hastalarda da serbest flep cerrahisi üzerindeki kaygıların azalacağı literatür örnekleri vurgulanmıştır.

Anahtar Sözcükler: Yaşlı; Cilt Kanseri; Serbest Flep.

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Introduction

The advances in modern medicine not only increase life expectancy in the elderly population, but also increase the incidence of cancer (1). Skin cancer is the most common type of cancer in the United States and is classified as melanoma and non-melanoma (2). Non-melanoma cancers often occur in the head-neck region and the incidence increases with age (2). Although many options are available for reconstruction after the excision of the tumor from the head-neck region, the technique selected for reconstruction should yield satisfactory cosmetic and psychological results.

Morbidity and mortality related to surgery increase with age due to cardiac, pulmonary, and renal problems (3). In addition, studies have indicated that free flap transfer is a safe method, with proper preoperative management, in elderly patients (4). This case report presents a 96-year-old female patient who underwent tumor excision for non-melanoma skin cancer on the mentum of the mandible and subsequent reconstruction with free tissue transfer.

Case Report

A 96-year-old female patient presented to our clinic due to squamous cell carcinoma diagnosed by incisional biopsy in another center. The physical examination revealed a 4x5 cm tumor mass on the mentum of the mandible with ulceration and scab at the center, induration around the lesion, and a 1x0.5 cm satellite lesion in the right superolateral site of the primary lesion showing similar characteristics (Figure 1). The patient's past history was not remarkable for smoking or alcohol use, and the patient did not have additional conditions other than chronic anemia (Hb: 11.2 g/dL). The ultrasonographic (USG) examination of the neck did not reveal any pathological findings, and preoperative consultation by a pulmonologist and the anesthesiologist did not report any conditions that would prevent surgery; the patient's ASA (American Society of Anesthesiologists) score was 2. The patient underwent an operation under general anesthesia for 2.5 hours. The lesion on the mandible was totally removed, together with 1 cm of normal tissue around the lesion. For the reconstruction of the skin defect, a radial forearm free flap was prepared (Figure 2) and anastomosis was performed between the radial artery and the concomitant vein, being the pedicle of the flap, and the facial artery and facial vein under microscopy (Figure 3). Neck dissection was not considered due to the advanced age of the patient and possible postoperative complications. Hemoglobin level was found to be 9.5 g/dL after the operation and no complications were observed at follow-up (Figure 4). The patient was discharged at postoperative day 3 and referred to medical oncology and radiation oncology clinics. The histopathological examination of the lesion revealed well-differentiated squamous cell carcinoma, and the surgical margins were tumor-free. After the oper-



Figure 1— Tumor mass at the level of the mentum of the mandible.

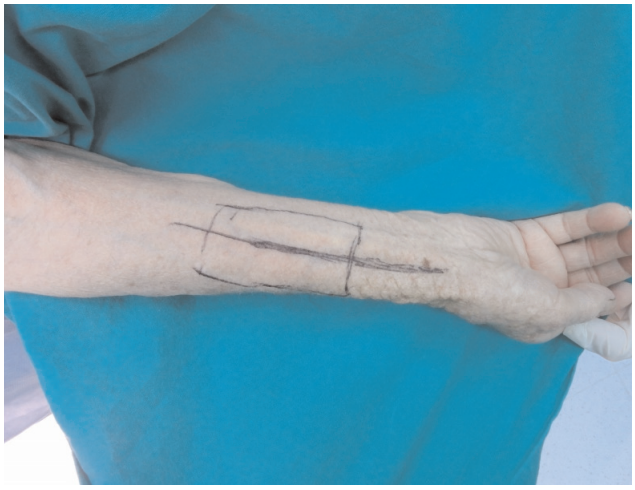


Figure 2— Planning of radial forearm flap by determining the projection of the radial artery using hand-held Doppler.



Figure 3— Planning of the surgical margin and projection of the facial artery.

ation, the patient was placed on follow-up with neck ultrasonography at three-month intervals. The control examination at the postoperative sixth month did not reveal new lesions, and there was no evidence of pathological lymphadenopathy on the neck USG.

Discussion

Surgical excision is the gold standard treatment for skin cancers occurring in the head and neck region. All steps of reconstruction including secondary healing, primary closure, skin grafting, and local and free flaps can be used after excision of the skin cancers (5). However, the method to be selected in the head and neck lesions should yield satisfactory cosmetic and functional outcomes. In general, local flaps (local tissue flaps) are preferred in the reconstruction of small or moderate size defects. Microsurgical reconstruction with free flaps is preferred in large or composite skin defects. In addition, local flaps fail to satisfy in most cases, and free flaps become the first choice of treatment (6). Radial forearm and anterolateral thigh flaps (ALT) are ideal options in reconstruction of soft tissue defects in the head and neck region (7). In the present patient, the skin defect on the mandible that occurred after tumor excision was reconstructed using a radial forearm flap.

The most important drawbacks of free flap surgery are prolonged operation time and the necessity to perform a specific surgical technique (8). Therefore, it is not preferred in elderly patients. In the present case, most local options were



Figure 4— Reconstruction with free radial forearm flap after tumor excision (postoperative day 10).

not available due to the presence of a large skin defect after the excision of the cancer tissue. Completion of the operation in the short period of 2.5 hours reduced the risk of developing complications and allowed the selection of the most appropriate treatment option for the patient. The factors affecting the success of free flap surgery include age, gender, wound etiology, smoking habits, comorbid conditions, operation time, experience of the surgeon, and surgical technique (9). Although the present case had an advanced age, the lack of additional illnesses and short operation time contributed to the success of the surgery.

In a study by Coskunfirat et al. that evaluated the safety of free tissue transfer in elderly patients, ASA status, age and operation time of the patients were compared, and postoperative medical complications were found to be more common in ASA III and IV patients than in ASA I and II. Although prolonged operation time and the presence of comorbid illnesses increased surgical morbidity and mortality, it was highlighted that age was not a contraindication for the surgery (4). In a similar study Turrà et al evaluated free flaps in the head and neck region in elderly patients and they reported that free flaps could be safely used in reconstructive surgery in the head and neck region in all age groups (10).

Tsai et al. evaluated 1012 patients who underwent free tissue transfer due to head and neck cancer and reported on

197 patients aged above 65 years. Age above 70 years and introperative blood loss above 220 ml were important determinants of postoperative morbidity, and they highlighted the importance of meticulous preoperative geriatric and oncological evaluation, patient selection, and perioperative bleeding control (11).

In a series of 197 patients aged above 70 years, Howard et al. reported that free flaps could be successfully used from the technical point of view in patients above 70 years; however, they stated that perioperative mortality and medical complications in the eighth decade were two times more common compared to the seventh (12).

Previous studies showed that the ASA score is the most important determinant of postoperative medical complications after microsurgical procedures. ASA class 3 and class 4 patients are more prone to postoperative medical complications (4). On the other hand, the operation time seems to be the most important factor for the surgical complications. Serletti et al. performed a retrospective analysis of 100 patients to determine preoperative and intraoperative predictors of surgical and medical complications and they reported that patients with a higher ASA designation experienced more medical complications but not surgical complications. But increased operative time resulted in more surgical complications (13). In a similar study Ozkan et al. evaluated the microsurgical tissue transfers in elderly patients and they reported that ASA classification is a predictor for only medical complications, not for surgical complications. They also highlighted the importance of low operation time to prevent surgical complications (14).

The review of studies of free tissue transfer mentioned above involved a very low number of patients above 95 years who underwent free flap surgery. Even if free flap surgery would be expected to increase morbidity and mortality, considering the advanced age of the patient (96 years), the low ASA score, absence of additional conditions, and relatively shorter operation time resulted in successful surgery. In summary, free flaps can be safely employed in patients with advanced age; however, this requires meticulous preoperative, intraoperative, and postoperative patient management.

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Turkish Journal of Geriatrics
2014; 17 (3) 312-315

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Case Report

NONTHROMBOTIC PULMONARY ARTERY EMBOLISM IN AN ELDERLY PATIENT: HYDATID CYST

Abstract

A pulmonary artery embolism related to hydatid disease is extremely rare. Although isolated cases have been reported, it is usually due to a hepatic lesion invading the hepatic veins or inferior vena cava, or a direct embolism from right cardiac lesions. Patients may present with hemoptysis, dyspnea, chest pain, acute cor pulmonale, or sudden death. The diagnosis is made from a medical history, clinical findings and computed tomography imaging. The computed tomography shows single or multiple cystic lesions leading to a filling defect or obstruction in the pulmonary arteries. In this article we present a 76-year-old woman with multiple lung lesions and a bilateral pulmonary artery embolism. In this case the pulmonary artery embolism was considered to be secondary to the invasion of the inferior vena cava by the liver lesion.

Key Words: Pulmonary Arteries; Pulmonary Embolism; Hydatidosis; Echinococcosis, Hepatic; Echinococcosis; Pulmonary.

Olgu Sunumu

YAŞLI BİR HASTADA NONTROMBOTİK PULMONER ARTER EMBOLİSİ: KİST HİDATİK

Öz

Kist hidatiğe bağlı pulmoner arter embolisi çok nadir izlenir. İzole olgular bildirilmiş olsa da, genellikle karaciğerdeki bir lezyonun hepatik venlere veya vena kava inferiyora açılmasıyla ya da sağ kalpteki lezyonların embolisiyle oluşur. Hastalar kliniğe hemoptizi, dispne, göğüs ağrısı, kor pulmonale veya ani ölümle gelebilir. Tanı öykü, klinik bulgular ve bilgisayarlı tomografi görüntüleme ile koyulur. Bilgisayarlı tomografide pulmoner arterlerde dolum defekti veya tıkanma oluşturan tek veya çok sayıda kistik lezyon saptanır. Bu makalede çok sayıda akciğer lezyonu ve bilateral pulmoner arter embolisi olan 76 yaşındaki kadın hasta sunulmaktadır. Bu olguda pulmoner arter embolisinin vena kava inferiyorun karaciğerdeki lezyon tarafından invaze edilmesine bağlı olduğu düşünülmüştür.

Anahtar Sözcükler: Pulmoner Arterler; Pulmoner Emboli; Hidatidozis; Hepatik Ekinokok; Pulmoner Ekinokok

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Introduction

Echinoccocosis is a parasitic disease, endemic in some regions of the world. It is manifested as cystic and solid-appearing masses in virtually any organ. The lung is the second most common site of cyst development after the liver (1). Lung involvement is usually isolated but may be concomitant with liver disease.

A pulmonary artery embolism is an uncommon complication and is caused by the cystic form of echinococcus granulosus. The parasite may reach the pulmonary arteries by the haematogenous route from the liver or it may arise from right cardiac lesions (2). Chest pain, dyspnea, hemoptysis, malaise, fever, acute cor pulmonale, or even sudden death may be seen.

In this article we present a case with bilateral multiple lung lesions related to pulmonary artery embolism with hydatid disease (HD). The patient's chest X-ray and multidetector computed tomography (MDCT) findings are shown.

Case Report

A 76-year-old woman presented with a history of cough (2 years), loss of appetite and weight (6 kg in 3 months). She had been expectorating serous sputum for 2 to 3 months, which had been more mucoid in the last few days. The sputum was bloody two times in the week prior to admission. In the past, medical treatment had been recommended because of multiple pulmonary cysts. She had been treated with albendazole for 1.5 years. Unfortunately, she had ceased the therapy 6 months before, when she felt well.

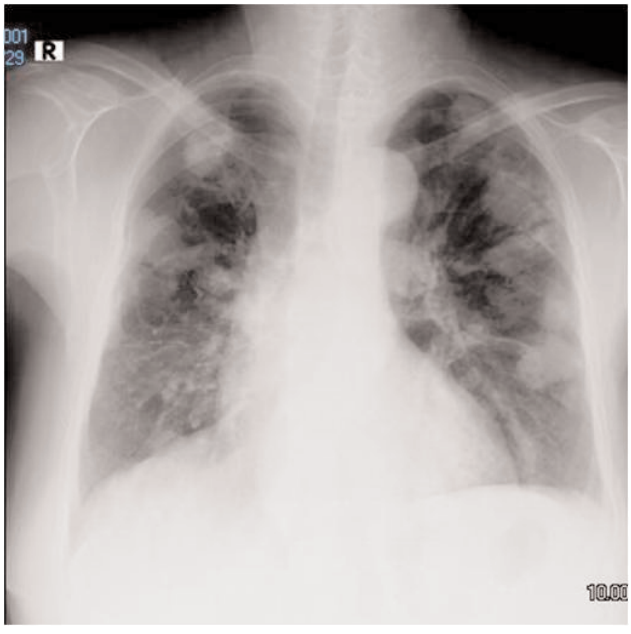


Figure 1— PA chest X-ray showing bilateral and multiple nodular lung lesions.

Systemic examination was unremarkable except for paleness and diminished breath sounds. Results of laboratory investigations were normal except for elevated CRP (2.79 mg/L) and sedimentation rate (64/hr) levels. Indirect hemagglutination for HD was >1:2560 (+). The chest X- ray showed multiple different sized and shaped nodules with smooth borders distributed in both lungs (Figure 1). Contrast-enhanced MDCT disclosed few cavitary lesions in the upper lung zones and disseminated cystic lesions. Multiple serpentine, cystic lesions were seen in the mid and lower zones of the lungs. Some of them were occluding the branches of the pulmonary arteries and some were arising from the peripheral bronchial carinas and tracking the bronchovascular bundles (Figure 2 A,B,C). On the upper abdominal images, an exophytic partially calcified caudate lobe lesion was seen. It reached the inferior vena cava (IVC) and the right adrenal gland (Figure 3). The IVC was partially occluded with HD.

Albendazole treatment was given to the patient. Lung lesions waned after 2 months of treatment, but she complained of hemoptysis 2 to 3 times. The patient is still in follow-up at our chest disease outpatient clinic.

Discussion

Although pulmonary artery embolisms are usually detected in patients with liver HD, isolated cases have also been reported (3). In all patients with liver lesions located near the IVC and/or hepatic veins, pulmonary artery involvement should be investigated with a systematic search (4). In our patient, an exophytic caudate lobe lesion lead to a pulmonary embolism via IVC. Multiple lung cysts may be associated with pulmonary artery embolism, as in our patient; however, these are not always present.

Three clinical presentations have been described in hydatid cyst-related pulmonary artery embolism: protracted pulmonary hypertension, pulmonary hypertension leading to death within a year, and acute fatal disease related to massive embolism (5). Obliterating cystic lesions or postoperative granulomatous reaction and fibrosis may cause pulmonary hypertension. Early diagnosis and treatment may prevent pulmonary hypertension.

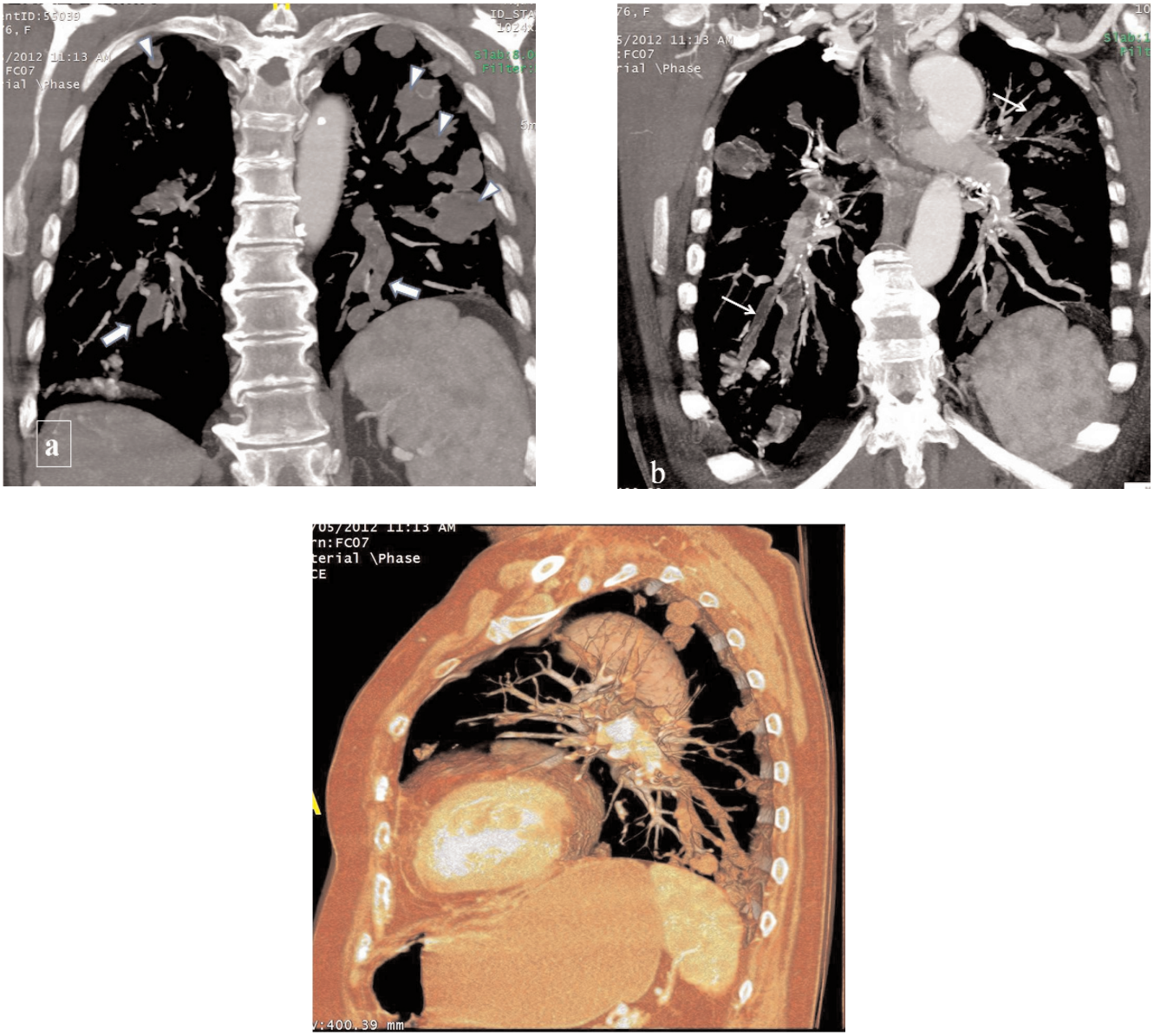


Figure 2— Coronal **(A, B)** and sagittal **(C)** reformatted MDCT maximum intensity projection images show low density cystic serpentine lesions (thick arrow) in the mid and lower zones of the lungs. They were occluding the left lung upper lobe and right lung lower lobe segmental pulmonary arteries (thin arrow). In addition several peripheral parenchymal cysts are noted (arrowhead).

The diagnosis of pulmonary artery embolism due to HD depends on clinical and radiological findings. Serologic tests can be used to confirm infection. The most accurate imaging modality is MDCT. It provides volumetric rendering techniques that raise diagnostic capability. Multiplanar reformatted images and three-dimensional reconstructions permit the exploration of fine anatomical detail and show extensions of the lesions and their relationships with pulmonary arteries. Accompanying heart, lung and liver lesions may be detected in a single scan. On contrast-enhanced MDCT scans, well-defined fluid attenuated cystic structures, partially or totally occluding the main pulmonary arteries with or without its



Figure 3— Axial contrast enhanced MDCT image showing partially calcified exophytic liver hydatid cyst protruding and invading the IVC (arrow).

branches, are seen. Intra-arterial lesions may cause enlargement of the vessel and an enhancement of the cyst wall may be detected (1, 6).

Pulmonary thromboembolism, tumor embolism and pulmonary artery sarcoma should be evaluated in the differential diagnosis. Acute thromboembolism may mimic HD embolism with acute onset of chest pain, cough and hemoptysis. It may be excluded with patient's medical history and a cystic filling defect in the pulmonary arteries on MDCT scan. Tumor embolisms usually occur in extrapulmonary malignancies such as sarcoma and breast, gastric, renal cell, prostate, hepatocellular, and choriocarcinoma. The specific signs that indicate tumor emboli in major branches are contrast enhancement within the intra-arterial filling defect and a dilated and beaded appearance of the affected pulmonary arteries (7). Pulmonary artery sarcoma is an aggressive tumor, shows enhancement with contrast agents and almost always has mediastinal or parenchymal invasion when it is detected (1).

In proximal pulmonary intravascular HD, the definitive treatment is excision of the pulmonary artery cyst and if possible extraction of the leading liver lesion. However, this treatment has several life-threatening risks. Patients should be informed about the rupture of the artery and/or the cyst, dissemination of the disease, anaphylactic shock, and pseudoaneurysm formation (2). In disseminated lung lesions and in patients who do not accept surgical intervention, medical therapy should be started.

In conclusion, in patients with pulmonary artery embolism, medical history should be investigated properly and HD should be kept in mind, especially in patients with liver echinococcosis. The definitive diagnosis and the dissemination of the disease can be accurately identified with MDCT.

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Turkish Journal of Geriatrics
2014; 17 (3) 316-320

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Case Report

INTRAHEPATIC PORTOSYSTEMIC VENOUS SHUNT

Abstract

Portosystemic shunts can be classified as intrahepatic and extrahepatic according to their anatomic features. Intrahepatic portosystemic shunts are rare vascular anomalies occurring between the portal vein and hepatic vein/ inferior vena cava, and can be congenital or acquired. With recent advances in diagnostic imaging techniques, the number of reports of intrahepatic portosystemic venous shunts identified incidentally in patients without symptoms is increasing. This is clinically important because intrahepatic portosystemic venous shunt can lead to hepatic encephalopathy. The rate of hepatic encephalopathy increases with age because of decreasing tolerance of the brain to toxic metabolites. The correct radiological diagnosis and proper treatment of this unusual abnormality is important. We present a case of noncirrhotic patient with a diagnosis of intrahepatic portosystemic venous shunt, accompanied by imaging findings.

Key Words: Patent Ductus Venosus; Ultrasonography, Doppler; Tomography, Spiral Computed; Magnetic Resonance Imaging.

Olgu Sunumu

İNTRAHEPATİK PORTOSİSTEMİK VENÖZ SANT

Öz

Portosistemik santlar anatomik özelliklerine bağlı olarak intrahepatik ve ekstrahepatik olarak sınıflandırılabilir. İntrahepatik portosistemik şant portal ven ve hepatic ven/ inferior vena cava arasında meydana gelebilen nadir rastlanan vasküler anomalilerdir ve konjenital veya kazanılmış olabilir. Tanısal görüntüleme yöntemlerindeki gelişmeler ile, semptomu olmayan hastalarda insidental olarak saptanan intrahepatik portosistemik venöz şantların sayısı giderek artmaktadır. Bunlar klinik olarak önemlidir çünkü intrahepatik portosistemik venöz şantlar hepatik ensefalopatiye neden olabilir. Hepatik ensefalopati oranı yaş ile artar çünkü beynin toksik metabolitlere olan toleransı azalır. Bu vasküler anomalilerin radyolojik tanısı ve uygun tedavisi bu açıdan önemlidir. Biz intrahepatik portosistemik venöz şant tanısı alan karaciğer sirozu bulunmayan olguyu görüntüleme bulguları eşliğinde sunmayı amaçladık.

Anahtar Sözcükler: Portosistemik Venöz Şant; Ultrasonografi, Doppler; Tomografi, Spiral Komputerize; Manyetik Rezonans Görüntüleme

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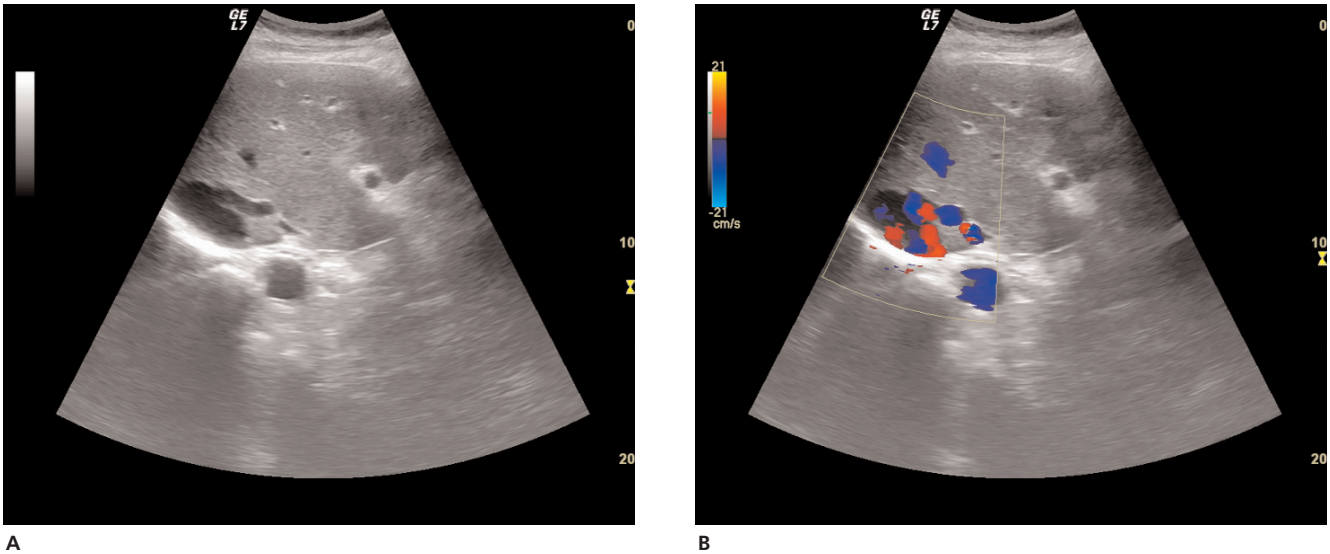
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Introduction

Portosystemic shunt are classified into two types, according to their anatomical features, as intrahepatic venous type and extrahepatic venous type (1). Extrahepatic shunts, which provide communication between the systemic vein and portal vein in cases with portal hypertension, occur with significant frequency. Coronary vein, esophageal varices and retroperitoneal collaterals are among the sites of extrahepatic shunts (2, 3). Intrahepatic portosystemic venous shunts (IPSVS) are abnormal communications between branches of the portal vein and the hepatic vein. They are rarely- encountered vascular anomalies which can be congenital or acquired (from trauma, cirrhosis, portal vein aneurism rupture, or percutaneous biopsy) (3, 4). Asymptomatic cases are increasingly detected with more frequent use of diagnostic modalities such as ultrasonography (US), computerized tomography (CT), and magnetic resonance imaging (MRI). The correct radiological diagnosis and proper treatment are clinically important, as these lesions may cause hepatic encephalopathy (HE) (3,4-8). Here we present a case of noncirrhotic patient in whom IPSVS was incidentally detected , accompanied by imaging findings.

Case

A 71 year-old female patient was admitted to our hospital following the identification of a hyperintense lesion in liver in T2- weighed images obtained by surrenal MRI, at another institution she had attended for hypertension. She did not have any history of trauma, operational procedure such surgery or biopsy , or alcohol use. Physical examination of the patient revealed hypertension (TA=160/100 mmHg). The liver was not enlarged , there was no evidence of ascites or symptoms of encephalopathy. No abnormalities were detected in the laboratory findings (aspartate aminotransferase (AST): 27U/L, alanine aminotransferase(ALT):25 U/L, gamma glutamyltranspeptidase (GGT): 35 U/L, alkaline phosphatase (ALP): 72U/L, lactate dehydrogenase: 166 IU/L, total bilirubin: 0.4mg/dL, albumin: 41 g/L). Tumor and hepatitis markers were negative (AFP:2.2 ng/mL, CEA: 1.57 ng/mL, HBs Ag:0.00(-), HCV Ab: (-)) and ammonia level was normal (20 microg/ml). In the abdominal US, a cystic lesion 3 cm in diameter at the 7th segment of the liver, and a tubular anechoic structure connected to the right portal vein in the vicinity, were observed. In the color Doppler US, color coding in the lesion (Figure 1A-B) and non-phasic current with low speed in the aneurismal section were detected. The dynamic abdominal MRI visualized the vascular communication between the right portal vein and the hepatic vein, while the aneurismatic lesion was detected in the liver by US. In dynamic images, the aneurysmal lesion showed simultaneous filling with the portal vein (Figure 2A-C). A finding of intrahepatic portosystemic venous shunt was considered for this patient. Neither cirrhotic nodules nor malignant mass lesions were detected in the liver. Collateral structures were observed



A B

Figure 1— Blood flow is observed **(A)** in US, in the cystic lesion detected in the 7th segment of the liver, and in the tubular structure connecting right portal vein to the lesion **(B)** in Color Doppler US.

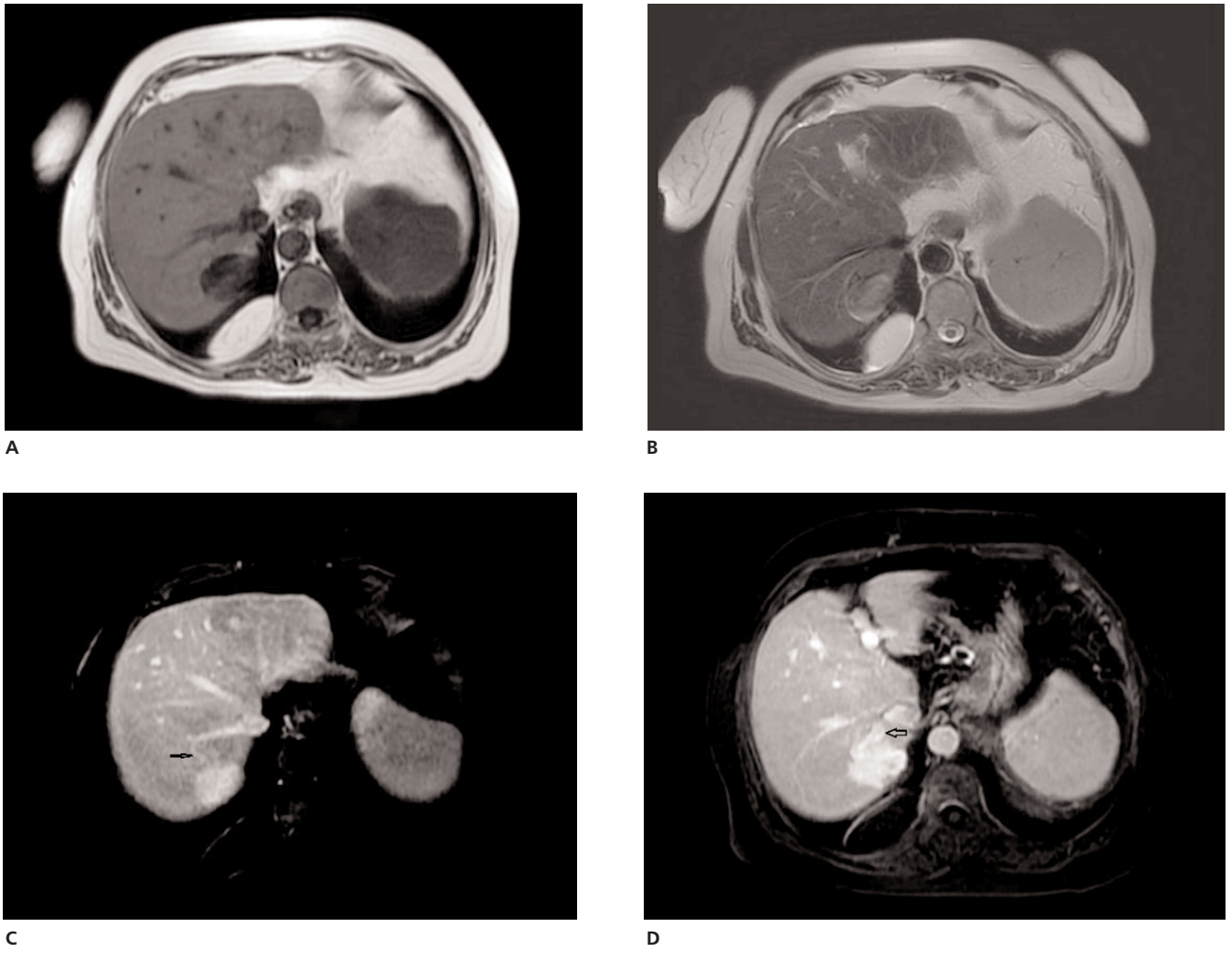


Figure 2— The communication of the aneurismatic lesion detected in Doppler US with the right portal vein (thick arrow) and the right hepatic vein (thin arrow) is seen (Park Type III) in **(A)** T1 weighted axial **(B)** T2 weighted axial **(C)** post-contrast fat suppression T1 weighted axial (portal venous phase) images.

in the splenomegaly and splenic hillus. The umbilical vein was open. Grade 2 esophageal varices were found in the endoscopy. The patient was assigned to follow-up with a dietary arrangement.

Discussion

The portosystemic venous collaterals observed in patients with portal hypertension are mostly extrahepatic (3). IPSVS is a rare entity; in approximately 40% of cases the shunts have been associated with liver cirrhosis and portal hypertension, and in 50-60% of cases with cerebral manifestations related to portohepatic encephalopathy (3,4,6,9). The pathogenesis of these vascular abnormalities is controversial. When a portal vein- hepatic vein communication is seen in a patient without liver disease or a history of trauma, it is presumed to be spontaneous or congenital in origin. The theory of congenital development of IPSVS suggests that an anastomosis exists between the subcardinal venous system and vitelline venous system in an early stage of embryologic development (3,4,6,9-11). Others suggest that a rupture of the portal vein aneurysm into the hepatic vein is the cause (3, 4).

Park et al. classified IPSVS into 4 groups (12). In Type I, a single wide vein is present between the right portal vein and

inferior cava. In Type II, single or multiple communications are observed between the peripheral branches of portal and hepatic veins in a single hepatic segment. In Type III, peripheral portal and hepatic vein branches are connected to each other through an aneurysm. In Type IV, there are multiple communications between peripheral portal and hepatic veins in both lobes of the liver. Our case was consistent with Type III of the Park classification. Although Park et al. mentioned Type I as the most frequent type of shunt, Tsitouride et al. detected Type III shunts in 5 of the 8 cases in their study (6). Remer et al. found Type III shunts in 13 of their series of 22 cases (3).

The prevalence of IPSVS as an incidental finding in asymptomatic patients is unknown. Some authors report that the prognosis of IPSVS depends on the shunt ratio and patient's age (5-7). In most reported cases, patients were over 50 years old (3,6,9). This is clinically important because IPSVS can lead to HE. Although many young patients do not develop HE when the shunt rate is low, the cerebral tolerance for hepatotoxic substances decrease gradually with age and increase the patient's risk for HE, particularly in elderly patients (1,3,4-7,11) .The pathophysiology of HE caused by portosystemic shunts involves substances that, instead of being normally metabolized by the liver, are shunted directly into the systemic circulation (11). Radiological diagnosis of these lesions is important in treatment planning (3,4,6). IPSVS are usually detected on sonographic examination of the liver, as cystic or tubular anechoic structures and their vascular nature can be inferred by continuity with the intrahepatic vessels (9). Small aneurismal lesions may be mistakenly diagnosed as hepatic cysts in US (2, 11). Color and power Doppler are diagnostic since they demonstrate the vascular features of the abnormalities detected sonographically, showing the presence of blood within the cystic or tubular lesion. Furthermore, spectral tracings and velocity measurements can be used to evaluate the hemodynamics of the shunt (2, 9,10). When the shunt ratio exceeds 60%, the risk of developing HE is increased, and a portal shunt ratio more than 60%, even without encephalopathy, is an indication for therapeutic intervention in noncirrhotic cases (4). In our case, the blood flow in a cystic lesion associated with the portal vein detected in US was shown using Doppler US and hepatic vein communication was found in dynamic MRI, applied after pre-diagnosis of the portal vein aneurysm.

Multiphase helical CT and dynamic MRI represent advances in cross-sectional imaging that allow evaluation of the liver during arterial and portal venous phases of contrast enhancement (9,11). The Type III IPSVS observed in our case may be identified through the hepatic vein branch that provides early venous drainage to the hepatic vein and dilated portal vein branch associated with venous aneurism in dynamic MRI (2, 3,6,9,13). The major advantage of this modality is multiplanarity, and MR angiography seems useful in evaluating the relationships of the shunt to the portal and hepatic vessels (3,6,9). Angiography is preferred in cases where endovascular treatment would be used (9). The selection of treatment in IPSVS is controversial. In the treatment of symptomatic shunts, diet control and coil embolization by angiographic intervention or surgical methods may be preferred. Among these surgical methods are liver resections and shunt ligation. Surgical methods have higher morbidity and mortality rates compared to coil embolization (4,6,10).

In conclusion, noncirrhotic IPSVS is a rare vascular abnormality. The elderly patients with HE can be misdiagnosed as dementia, psychiatric disorders or irrational liver damage and to make matter worse, ineffective therapies such as medications and dietary restrictions are given or advised. The accurate diagnosis of IPSVS and an awareness of this disease are important.

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Turkish Journal of Geriatrics
2014; 17 (3) 321-323

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Case Report

NORWEGIAN SCABIES IN ELDERLY DIABETIC PATIENT : A CASE REPORT

Abstract

Norwegian scabies is a highly contagious skin infestation caused by the ectoparasite Sarcoptes scabiei, which mainly affects immunosupressed and geriatric individuals. Clinically, it may simulate various dermatoses. We report herein a 70 year old man with diabetes mellitus who developed palmoplantar hyperkeratosis, with widespread excoriation over the trunk and extremities. His complaints had been present for about ten years. The lesions were crusted scabies with absence of itch sensation due to peripheral neuropathy and diabetes mellitus for 30 years. Microscopic examination of the skin scales with potassium hydroxide revealed numerous scabies mites and eggs. Topical 5% permethrin cream therapy was prescribed as 2 treatments, with each treatment applied once a week

Key Words: Scabies; Diabetic Neuropathies; Keratoderma, Palmoplantar.

Olgu Sunumu

YAŞLI DİYABETİK HASTADA NORVEÇ UYUZU OLGUSU

Öz

Norveç uyuzu bir ektoparazit olan Sarcoptes scabiei'nin neden olduğu, yüksek bulaştırıcılığı olan bir enfeksiyondur. Klinik olarak birçok dermatozu taklit edebilir. Biz burada yaklaşık on yıldır şikayeti devam eden vücudunda yaygın ekskoriyasyonları ve palmoplantar hiperkeratozu olan 70 yaşında diyabetik bir erkek hasta sunuyoruz. Otuz yıldır olan diyabete bağlı oluşan periferik nöropati nedeniyle krutlu uyuz lezyonları kaşıntısız idi. Potasyum hidroksit ile alınan deri örnekleri mikroskobik incelemesinde çok sayıda uyuz akarları ve yumurtalarını saptandı. Birer haftalık Topikal% 5 permetrin krem tedavisi iki kür olarak hastaya olarak reçete edildi.

Anahtar Sözcükler: Uyuz; Diyabetik Nöropati; Palmoplantar Hiperkeratoz.

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Geliş Tarihi: 06/04/2014
(Received)

Kabul Tarihi: 24/06/2014
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Introduction

Crusted scabies (Norwegian scabies) is an ectoparasitic infestation caused by Sarcoptes scabiei, which is rare and highly contagious (1). Although it mainly affects immunocompromised and geriatric individuals, it may also affect individuals who have normal immune systems (2,3). It may be seen in various situations such as immunodeficiency of the host or reducing of itch sensation (4).

We here present a case of crusted scabies with absence of itch sensation due to peripheral neuropathy and diabetes mellitus for 30 years.

Case

When a 70-year-old male was an inpatient in the department of internal medicine owing to a diabetic leg ulcer and for management of irregular blood glucose levels, he was consulted to our clinic because of itchy lesions on his trunk, face and extremities, which he had had for 10 years. He had also had hypertension, diabetes mellitus type 2, and coronary artery disease for 30 years, and a history of cured tuberculosis. On dermatologic examination, there were widespread erythematous and excoriated papules on his trunk and other parts of his body, along with hyperpigmentation due to old lesions (Figure 1). Although the itching was widespread, he had no itching of his hands and feet because of peripheral neuropathy. Intense hyperkeratosis was observed on his palmar regions (Figure 2,3).

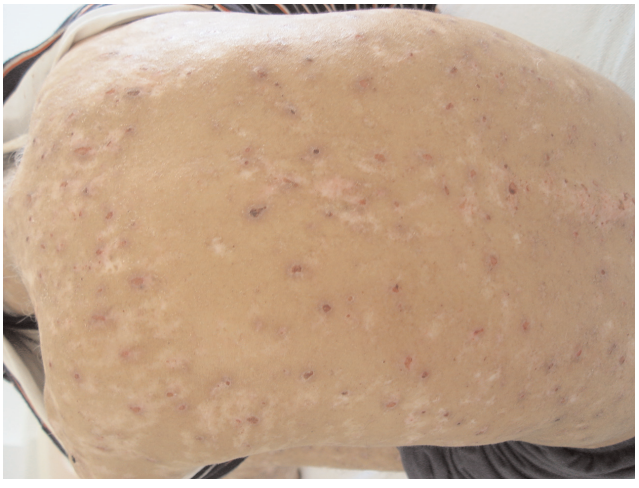


Figure 1— Diffuse lesion on the back.



Figure 2— The lesions on the extremities.

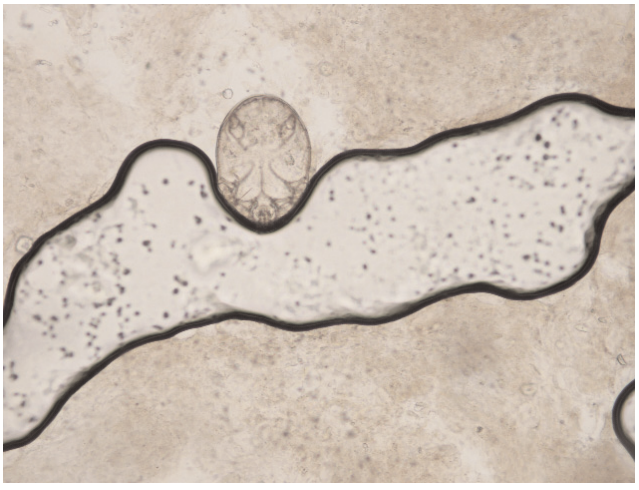


Figure 3— The mite of scabies.

The scrapings sample, which was obtained from the lesions on the patient's palmar regions, was prepared with 10% potassium hydroxide. On direct microscopic examination, a number of mites, eggs, and feces were detected (Figure 3). We diagnosed the patient with crusted scabies based on these findings. Topical 5% permethrin cream therapy was prescribed as 2 treatments, with each treatment applied once a week.

Discussion

Crusted scabies (Norwegian scabies) is a rare, serious infestation of Sarcoptes scabiei (5). Crusted scabies is especially seen in immunocompromised, mentally retarded, malnourished or geriatric patients (2). The risk factors for crusted scabies are low economic status, bad hygiene (6), age (7), diabetes mellitus (8), neuropathy, serious arthropathies, mental retardation and psychiatric diseases (9). Decreased immunoresponse causes hyperinfestation and absence of itching. Itching is important in the transport of parasites and destruction of

tunnels (9). For this reason, the number of parasites may exceed one million (2) and such patients have a high infection potential by direct contact (2).

Absence of itching, due to peripheric neuropathy related to diabetes mellitus, caused the progress of disease in our patient.

Involvement of the palmoplantar region and the face are first in importance, and the nails are distorted and thick (2). Typical skin lesions are tunnels, papules, excoriations and sometimes vesicules (6). The reaction, provoked by massive infestation, causes crusts and a form of hyperkeratotic lesion (9). It mimics psoriasis, seborrheic dermatitis, Darier disease, dermatitis herpetiformis and drug reactions (9). Our patient had both typical skin lesions, such as papules and excoriation on the trunk, and crusts and hyperkeratosis, located on the palmoplanter regions. The diagnosis must be made from samples obtained from the nails, finger webs, and tunnels. The samples are prepared with 10% KOH and parasites, eggs and feces must all be seen on microscopic examination for the diagnosis. If a diagnosis is not possible using this method, a biopsy of the stratum corneum must be performed, with parasites detected in the tunnels (10).

The treatment of crusted scabies is very difficult because of hyperkeratotic skin, involvement of the nails and the high parasitic load. Topical keratolytics, topical scabicidal agents and oral ivermectin may be used to treat the disease (2). Keratolytic agents are useful for the removal of hyperkeratotic skin and the penetration of drugs (5).

The patient must be isolated and the patient's surroundings must be disinfected (2). Suspicion of disease and early diagnosis are very important for preventing the spread of disease and providing relevant treatment (9).

The diagnosis of our patient was delayed for a long time. The wrong diagnosis may have serious results such as the spreading of infestation, septicemia, superinfection of lesions and erythroderma (6).

Our patient had diabetes mellitus and neuropathy, and his diagnosis had been delayed for 10 years. We present our patient to emphasize that the diagnosis of crusted scabies must be considered in geriatric, diabetic or neuropathic patients who have had hyperkeratosis or resistant pruritus for a long time.

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Turkish Journal of Geriatrics
2014; 17 (3) 324-330

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Review Article

MANAGEMENT OF INCONTINENCE IN THE FEMALE GERIATRIC POPULATION: BEHAVIORAL THERAPY

Abstract

During the aging process, the female lower urinary tract begins to show changes such as muscle atrophy due to estrogen deficiency, replacement of muscle tissue by fat tissue and a consequent reduction in the contraction strength of pelvic floor muscles, which may lead to involuntary urine loss. Urinary incontinence is not an event that directly threatens the lives of people, but for 37-57% of elderly women it negatively affects their quality of life. The treatment of urinary incontinence uses both surgical and conservative treatment methods. Conservative treatment is commonly preferred because conservative methods, in contrast to surgery, have little risk of mortality and are simple, easy to implement, less invasive, more reliable, and requires a lower level of patient compliance than more invasive urinary incontinence treatments. Behavioral treatment, which is a component of conservative treatment in the geriatric female population with urinary incontinence, is used as the first choice of treatment. Behavioral treatment methods include pelvic floor muscle exercises, bladder training, timing of voiding, and developing healthy lifestyle behaviors. Behavioral treatment methods require an individual\'s active participation and health care professionals' time and effort. Most elderly people experience a decrease in urinary incontinence symptoms and an improvement in their quality of life with behavioral therapy. This paper includes a literature review that describes behavioral treatments, the first choice of treatment for urinary incontinence with the geriatric female population.

Key Words: Urinary Incontinence; Aged; Female; Behavior Therapy/methods

Derleme

GERİATRİK KADIN POPÜLASYONUNDA İNKONTİNANS SORUNUNUN YÖNETİMİ: DAVRANIŞSAL TEDAVİ

Öz

Yaşlanma süreci ile birlikte yaşlılıkta, östrojen eksikliğine bağlı kadınlarda alt üriner sistem kas atrofileri, yağ dokusu ile kas dokusunun yer değiştirmesi, pelvik taban kaslarının güçlü kasılmalarının azalması gibi fizyolojik değişiklikler meydana gelir. Bu değişiklikler istemsiz idrar kayıplarına yani üriner inkontinansa neden olabilir. Üriner inkontinans doğrudan kişinin yaşamını tehdit eden bir olay olmasa da yaşlı kadınların %37-57'sinin yaşam kalitesini olumsuz yönde etkilemektedir. Üriner inkontinansın tedavisinde cerrahi yöntemler ve cerrahi yöntemlerin dışında kalan konservatif tedavi yöntemleri kullanılmaktadır. Konservatif yöntemler cerrahi yöntemlere göre mortalitenin eşlik etmemesi, basit olması, kolay uygulanabilmesi, en az girişimsel olması, daha güvenilir olması, yan etkilerinin olmaması, hasta uyumunun yüksek olması nedeniyle üriner inkontinansın tedavisinde yaygın olarak tercih edilmektedir. Konservatif tedavinin bir bileşeni olan davranışsal tedavi yöntemleri üriner inkontinanslı geriatrik kadın popülasyonunda tedavide ilk seçenek olarak kullanılmaktadır. Davranışsal tedavi yöntemleri arasında pelvik taban kas egzersizleri, mesane eğitimi, işeme programı oluşturma, sağlıklı yaşam biçimi davranışlarının geliştirilmesi yer almaktadır. Davranışsal tedavi yöntemleri bireyin aktif katılımını, sağlık profesyonellerinin zaman ve çabasını gerektirmektedir. Davranışsal tedavi yöntemlerinde yaşlıların çoğunluğu üriner inkontinans semptomlarında azalma ve yaşam kalitelerinde iyileşme deneyimlerler. Bu derlemede üriner inkontinanslı geriatrik kadın popülasyonunda tedavi için ilk seçenek olan davranışsal tedavi yöntemleri ele alınmıştır.

Anahtar Sözcükler: Üriner İnkontinans; Yaşlı; Kadın; Davranışsal Tedavi.

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Geliş Tarihi: 07/04/2014
(Received)

Kabul Tarihi: 24/04/2014
(Accepted)

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INTRODUCTION

Developments in science and technology have improved living conditions and health care services, decreased death rates, and thus caused an increase in life expectancy as well as in the proportion of elderly people in the general population, not only in our country but also across the world. Aging is experienced in all living beings; and it is a chronic and universal process which encompasses all the irreversible structural and functional changes in the organism (1). Elderly people, with their decreased adaptability due to physiological changes, experience psychosocial problems such as chronic illnesses, dependency in their daily activities and problems regarding their care. Due to estrogen deficiency, aging brings physiological changes such as lower urinary tract muscular atrophy, replacement of muscle tissue with fatty tissue, and a decrease in the strong twitch of the pelvic floor muscles. These changes can cause involuntary leakage of urine, namely urinary incontinence (2).

The most common types of urinary incontinence in elderly women are grouped as urge incontinence (involuntary leakage of urine associated with a sudden, strong desire to urinate), stress incontinence (leakage of urine with physical activity), mixed incontinence (combination of stress and urge incontinence), and overflow incontinence (involuntary release of urine from an overly full bladder) (3).

Stress incontinence, after urge incontinence, is the most common incontinence type in elderly women. In addition to estrogen deficiency in old age, the severity of stress incontinence can increase due to such factors as pelvic operation history, frequent vaginal delivery history, or obesity. Urinary incontinence is experienced with some activities that increase intra-abdominal pressure; examples include coughing, laughing, exercising, and changing positions. On the other hand, stress incontinence can be experienced as a result of intrinsic stricture deficiency in old age, trauma caused by anti-incontinence surgery, or serious urethral atrophy. Even slight increases in intra-abdominal pressure may cause incontinence, or continuous urine leakage that is experienced throughout the physical activity (4).

Urinary incontinence is considered important because it requires long-term care and causes loss of independence, poor quality of life, limitation of social activities, and increased anxiety and social isolation in the elderly (5).

The prevalence of urinary incontinence varies depending on the type and severity of the incontinence as well as the population investigated. Although urinary incontinence is not a life threatening factor in itself, it has negative effects on the quality of life of 15 to 30 % of the general female population, 20% of middle-aged women, and 45% of elderly women (6). In their cohort study which aimed to define the disease profile in elderly patients aged 85 and over, Collerton et al. (2009) found a prevalence of urinary incontinence of 42.1%. The prevalence of severe urinary incontinence was found to be 21.3% (7).

Ateşkan et al. investigated 2000 elderly people aged 65 and over (1276 women and 724 men) in Turkey, and found an overall prevalence of urinary incontinence of 44.2%, and a prevalence in women of 57.1%. The study found that the most common form of urinary incontinence type was mixed type, in which stress and urge incontinence symptoms are seen together (70.1%) (8).

Urinary incontinence is treated with both surgical methods and conservative treatment methods other than surgery. Conservative treatment methods are generally preferred because they involve no mortality; they are easily implemented; they are the least interventional methods; they are safer; they have no side effects; and they have high patient compliance (9). Conservative methods include medication, behavioral treatment, electrical stimulation and neuromodulation (10). This review discusses behavioral treatment, the first-line treatment method in the female geriatric population with urinary incontinence.

Behavioral Treatment

Behavioral treatment, which is a component of conservative treatment, is recommended as a first-line treatment in all guides on the treatment of urinary incontinence, overactive bladder, and lower urinary tract symptoms. Behavioral treatment includes regulating urinary habits, maintaining healthy life behaviors, and reforming the strength and control of the pelvic floor muscles. The aim of changing elderly people's behavior is to decrease or cure the symptoms. Clinical practice is individualized according to each patient's unique needs and situation, and behavioral methods can be used together. Behavioral treatment methods are generally based on two approaches. One of these approaches focuses on improving pelvic floor strength/control, emptying the bladder, and teaching the patient how to suppress urgent need to urinate. The other approach focuses on regulating bladder function by making changes in urination habits and delaying urination. Patients are trained with a view to helping them change behaviors (9, 10).

The components of behavioral therapy include pelvic floor exercises, bladder training, planning an urination schedule, and developing healthy lifestyle behaviors.



Pelvic Floor Muscle Exercises

Pelvic floor muscle exercises (PFME), first defined by Arnold Kegel in 1948, aim to strengthen pelvic floor muscles, improve urethral sphincter function, stabilize the vagina by reducing pelvic organ prolapses, increase bowel control, and reduce sexual problems and laceration risk in vaginal deliveries (10).

PFME is the first-line treatment of stress incontinence in elderly people. Older women benefit from PFME as much as younger women do. Kegel exercises can reduce the frequency of stress incontinence in motivated and cognitively compliant elderly women (9).

Randomized controlled studies in the relevant literature show that PFME are effective in increasing and maintaining continence (5). However, PFME in the elderly were found to be most effective in curing stress type urinary incontinence (11).

Similarly, in their systematic review published in a Cochrane data base, Dumoulin and Hay-Smith (2010) reported that women with incontinence complaints who did PFME demonstrated more improvement compared to a control group. It was also found that a decrease in women's average age and an increase in the duration of the exercise program increased the percentage of recovery, and that PFME are more effective in curing stress incontinence than in curing urge or mixed types. The treatment was more effective in women who did PFME for at least three months (12).

In terms of evidence-based medicine, the relevant literature mentions Group A evidence regarding PFME in treating stress incontinence in general population. Muscle training for PFME should start with 8 contractions at least three times a day (Category A). The training should continue for at least three months (Category A). Implementing pelvic floor muscle training with the guidance of a physiotherapist or continence nurse is of great importance, not only for good practice but also for monitoring improvement (GPP= good practice point). Pelvic floor muscle exercises can be considered for cognitively compliant elderly people, but there is not a sufficient number of studies on the issue for this age group (Category C) (13).

Appropriate instruction of patients in PFME, which is accepted as the first-line treatment in stress incontinence, is important for elderly women's use of the right muscles. Elderly women should be motivated verbally and provided with the necessary anatomic information before the instructions (9, 10). They should wear comfortable clothes and their bladder should be emptied before starting the exercise. The patient should not contract stomach, hip, and thigh muscles or do the Valsalva maneuver while doing the exercises. The International Incontinence Society recommends that exercises should be completed three times a day with at least 8 contractions, and continued for at least three months (10). The exercise program should be maintained and monitored regularly. Muscle strength assessments should be done once a month with a view to increasing elderly people's motivation and modifying the program. Elderly people might need longer education intervals.

Bladder Training

Bladder training was first defined by Jeffcoate and Francis in 1966. In an article entitled "Bladder training and related therapies for urinary incontinence in older people", Hadley mentioned four types of bladder training: bladder training, habit training, timed voiding, and prompted voiding (14).

Bladder Training: Bladder training aims to reduce frequent urination, increase bladder capacity, eliminate the feeling of urgent urination, and increase urination intervals up to 3-4 hours. Bladder training is a formal program that generally lasts 6-8 weeks and aims to teach urination at certain time intervals that are increased weekly (10). This program uses a behavior modification technique in which urination is included and the intervals between urinations are increased slowly. At the beginning, the interval between urination attempts is 1 hour. Whether there is a need to urinate or not, the patient has to urinate according to the schedule. If the patient is ready, urination intervals should be increased by 15-30 minutes every week. The purpose is to increase the interval for urination attempts to 2-4 hours. Bladder training continues for 6 weeks. Incontinence episodes can be reduced by 60%. Desensitization techniques can be used for specific events that trigger incontinence (for example the urge to urinate with the sound of water). Success depends on the motivation of both the woman and the doctor (11). Evidence-based studies in the literature recommend bladder training for the treatment of stress incontinence in the general population when appropriate (Category B) (15).

Habit Training: Habit training is scheduled toileting which is planned in accordance with the patient's micturition habits. The patient is assessed to see if she is dry at the scheduled micturition time. Recording micturition takes a lot of time. If the patient maintains a toileting schedule, the training aims to increase the micturition intervals. This practice requires patient compliance and cognitive competence (16).

Timed Voiding: Timed voiding enables the patient to go to the toilet and urinate at certain times. The urination schedule is identified beforehand. The only differences are that no intervention is implemented in order to delay or suppress the feeling of urination, and urination intervals are not extended to longer intervals each time. The purpose is to keep the patient dry by making her urinate before she experiences incontinence (10).

Prompted Voiding: Prompted voiding is generally implemented by caretakers. Nursing home patients are frequently checked by the caretakers and asked to use the toilet. It is done when they start to comprehend the feeling of fullness and the need to go to the toilet. The patient is praised when she maintains urinary continence and attempts to urinate. She is encouraged to go to the toilet in every 2-4 hours or is provided with a bedpan. This period is proven to be effective for dependent patients or patients with reduced cognitive competence. Moreover, it can be used with patients whose cognitive competence is not enough to use more complex behavioral treatments (10).

In their randomized controlled study conducted with participants aged 55 and over, Diokno et al. (2004) found that behavioral therapy given over the course of 4 weeks increased pelvic floor muscle strength and urination intervals, and urination frequency was within normal ranges. It was reported that the therapy resulted in statistically significant differences (17). Evidence-based studies recommend timed voiding for elderly and cognitively incompetent patients (Recommendation Level: A) (15).

Healthy Lifestyle Behaviors

Lifestyle factors that are considered to be effective in improving and maintaining lower urinary tract functions include weight control; management of liquid intake; quitting smoking; limiting caffeine, alcohol, and other things that irritate the bladder; exercising; and developing regular bowel habits. Changing lifestyle and urination habits requires making significant behavior changes in daily life as well as adapting to these changes. Evidence-based studies recommend lifestyle changes for improving urinary incontinence symptoms (Recommendation level: C) (15).

Losing Weight: Intra-abdominal pressure caused by increased body weight is one of the reasons for pelvic floor innervation and decline in muscle structure. The increase in intra-abdominal pressure causes an increase in vesical pressure and urethral mobility. Thus, stress incontinence is more common in obese women (18). In their randomized controlled studies conducted in different periods, Subak et al. found that a 5% weight loss with the help of behavioral weight loss programs, which included a low calorie liquid diet and exercise, reduced the prevalence of urinary incontinence by 50% (19). Another study revealed that a three-month behavioral weight loss program including only a low-calorie liquid diet helped the participants in the experimental group lose 14 kilogram more than those in the control group, which resulted in a 60% decrease in the prevalence of urinary incontinence (20).

Management of Fluid Intake: Approximately 7 to 40% of women with urinary incontinence limit liquid intake so as to deal with its symptoms. Descriptive studies conducted with women aged 55 and over demonstrate a low or medium positive relationship between liquid intake and the severity of incontinence (21). Clinical studies show that common urinary incontinence symptoms recover with fluid restriction (22). However, elderly people should drink at least 2 liters of liquid (8 to 10 glasses) every day in order to meet their daily need (1). Urine concentration may increase when fluid intake is limited in order to reduce incontinence, which may irritate the bladder. Therefore, elderly people should be encouraged to take in liquid at certain intervals even when they are not thirsty in order to meet their daily need. Older people should be advised to take in liquid during the day so as to decrease nocturia; fluid intake can be limited after 6 o'clock in the evening (9). Evidence-based studies recommend that elderly people in nursing houses should take in enough oral liquid to increase urine volume (Recommendation level: C) (15).

Quitting Smoking: Smoking is known to have an unquestionable relationship with the development of diseases in many systems. Although there is limited data about whether cigarette smoking is a risk factor for urinary incontinence, a descriptive study has revealed a highly significant relationship between smoking and detrusor instability (23). In their study conducted with women aged between 30 and 70 who had stress incontinence, Fuganti et al. (2001) found an independently significant relationship between obesity and smoking and maximum intravesical pressure increased by coughing. Although losing weight reduced maximum intravesical pressure, quitting smoking was found to have no effect on peak intravesical pressure. It was also highlighted that quitting smoking without a change in lifestyle would have no positive effects on stress incontinence (24).

Diet: Management of incontinence problems in the female geriatric population requires making changes in diet as well.

Box 1— Food That Can Replace Bladder Irritants.

Bladder Irritants	Food That Can Replaced Bladder Irritants
Caffeine, alcohol, acidic fruit and fruit juice, tomatoes and tomato products, artificial sweeteners, spices, yoghurt, cheese, carbonated drinks, vinegar, onion, mayonnaise, banana and nut.	Water, herbal tea, milk, caffeine reduced drinks, white chocolate, apple, pear, peach, grapes, melon, watermelon, almond, pine nut, garlic.

Food that irritates the bladder should be excluded from the diet. If no change is observed in the incontinence problem, the food is allowed to remain in the diet. Potential bladder irritants and that can replace bladder irritants demonstrates Box 1 (11). Studies investigating the relationship between urinary incontinence and caffeine consumption, which is known to be a potential urinary irritant, demonstrated no significant relationship between caffeine consumption and urinary incontinence. It was reported that further studies on the issue are needed (25). Evidence-based studies show contradictory evidence regarding the effect of caffeine intake on incontinence (Recommendation Level B/C). Reducing caffeine intake in elderly people should be considered (Recommendation Level C (15).

Developing Regular Bowel Habits: There is a positive relationship between stress incontinence and defecation difficulties and constipation. Strain during defecation may cause pudendal nerve damage or weakness of the pelvic floor muscles. The diet should include enough fluid and highly fibrous food so as to prevent the development of constipation. Stool emollients can be used if necessary. Developing regular bowel habits and doing age-appropriate physical activities for symptoms of urinary incontinence are recommended (10).

In conclusion, behavioral treatment methods are recommended as the first-line treatment for urinary incontinence in the female geriatric population. Although behavioral treatment methods are cost-efficient, they require the active involvement of the individuals as well as the efforts and time of health professionals. The majority of patients using behavioral treatment methods experience a decrease in incontinence symptoms and improvement in their quality of life.

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