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From The Editor In Chief

Training programs continue to be organized by Turkish Geriatrics Society. The 7th Geriatrics and Gerontology course, organized by Turkish Geriatrics Society and Hacettepe University Research Center of Geriatrics Sciences-GEBAM by the support of International Institute on Ageing-INIA will be held in 2-6th March, 2020 in Ankara-Turkey.

All the aspects of geriatrics and gerontology will be discussed by distinguished scientists and clinicians. Trainers contributing to this course will provide a comprehensive overview of geriatrics and gerontology.

Multidimentional and multidisciplinary scientific programme will be composed of the following subjects.

Population Ageing,The Madrid International Plan of Action on Ageing and Turkey National Plan of Ageing, Inflammation and Ageing, Communication with Older Patients, Geriatric Syndromes, Geriatric Emergencies, Comprehensive Geriatric Assesment, Checkups for older persons, Dementia, Immobility in Later Life and Physical Activity Recommendations, Frail Older Persons, Neuropsychological Assessment for the Elderly, Falls in Later Life and Preventive Measures, Rationale Drug Use in Later Life, Drug and Food Supplement Interactions in Later Life, Vision problems, Skin and Tasting problems, Hearing and Smelling problems, Quality of Life in Later Life, Basic Principles of Geriatric Rehabilitation, Age-Friendly Cities, Abuse and Neglect in Old Age, Standards of Social Services for Older Persons, Healthy Nutrition in Elderly, Oral and Dental Health in Later Life, Oral and Dental Signs of Systemic Diseases in Later Life, Sociological Perspective of Ageing, Frailty and Sarcopenia, Basic Problems of Aged Consumers And Recommendations, Disability Concern and Prevention, Geriatric measures and tools, Pressure ulcers, Home Care for Older Persons, Ethical Aspects of Ageing and Frequent Legal Issues for Older Persons.

The course will provide several scientific source materials and a visit to a nursing home will also be performed. The details of this course is announced on the website of Turkish Geriatrics Society and the board of directors is honored to invite you to this scientific event.

Prof. Yeşim GOKCE KUTSAL, M.D.
Editor in Chief

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RESEARCH

COMPARISON OF THREE FIRST-LINE TREATMENTS IN ADVANCED PANCREATIC CANCER PATIENTS OLDER THAN 65 YEARS OF AGE: SINGLE-CENTRE EXPERIENCE

Abstract

Introduction: Elderly advanced pancreatic cancer patients are frequently undertreated due to comorbidities, age, lack of evidence-based clinical practice guidelines for senior patients and patient's or physician's preference. An optimal, less toxic and most efficacious first-line chemotherapy regimen should be elucidated. The present study aimed to compare the efficacy and toxicity profiles of three first-line treatment regimens and describe prognostic factors in elderly pancreatic cancer patients.

Materials and Method: Patients of an age >65 years with histologically confirmed metastatic pancreatic adenocarcinoma not amenable to curative surgical resection were included in the study. Efficacy and toxicity profiles of FOLFIRINOX (Group A, 16 patients), cisplatin-gemcitabine combination therapies (Group B, 16 patients) and gemcitabine monotherapy (Group C, 15 patients) in elderly patients with advanced pancreatic cancer were evaluated retrospectively.

Results: There was no difference between the groups in terms of disease control rates, overall survival, and progression-free survival. Age, primary tumour resection, tumour grade and use of second-line chemotherapy were not found to be independently prognostic on overall survival (OS). Younger age <70 (p=0.028) and cisplatin-gemcitabine chemotherapy positively prognostic on OS (p=0.011) whereas liver involvement was negatively prognostic on OS (p=0.046). The toxicities of the groups were not different from each other but the hospitalization was statistically higher in FOLFIRINOX group.

Conclusion: The study revealed that there are no differences in disease control rates and adverse events of three regimens but showed increased overall survival with cisplatin–gemcitabine combination in elderly patients with pancreatic cancer.

Key words: Pancreatic cancer; Therapeutics; Geriatrics.

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ARAŞTIRMA

ALTMIŞ BEŞ YAŞ VE ÜZERİ METASTATIK PANKREAS KANSERİ HASTALARINDA BİRİNCİ SIRA ÜÇ FARKLI TEDAVININ KARŞILAŞTIRILMASI: TEK MERKEZ DENEYİMİ

Öz

Giriş: Yaşlı metastatik pankreas kanseri hastalarında ileri yaş, yandaş hastalık varlığı, yaşlı hastalar için kanıta dayalı klinik uygulama kılavuzlarının olmaması, hastanın kendi tercihi veya hekimin tercihi nedenleriyle daha az tedavi uygulanmaktadır. Bu hastalarda en az toksite ile en fazla etki gösterecek optimal ilk sıra tedavilerin tanımlanmasına ihtiyaç vardır. Bu çalışmadaki amacımız yaşlı metastatik pankreas kanserli hastalarda üç farklı birinci sıra tedavi rejiminin etkinlik ve toksite açısından karşılaştırılması ve prognostik faktörlerin tanımlanmasıdır.

Gereç ve Yöntem: Çalışmaya küratif cerrahi rezeksiyona uygun olmayan histolojik olarak doğrulanmış metastatik pankreatik adenokarsinomlu 65 yaş ve üstü hastalar dahil edildi.Metastatik pankreas kanseri olan yaşlı hastalarda FOLFIRINOX (Grup A, 16 hasta), sisplatin-gemsitabin kombinasyon tedavisi (Grup B, 16 hasta) ve gemsitabin monoterapisinin (Grup C, 15 hasta) etkinlik ve toksisite profilleri retrospektif olarak değerlendirildi.

Bulgular: Gruplar arasında hastalık kontrol oranları, genel sağkalım ve progresyonsuz sağkalım açısından fark izlenmedi. Yaş, primer tümör rezeksiyonu , tümör gradı ve ikinci basamak kemoterapinin kullanımı; genel sağkalım (OS) üzerine etkili bağımsız prognostik faktör olarak bulunmadı. Daha genç yaş <70 p=0.028) ve sisplatin-gemsitabin kemoterapisi kullanmak (p=0.011) OS üzerine etkili pozitif prognostik faktör, karaciğer tutulumu ise OS üzerine etkili negatif prognostik faktör olarak izlendi (p=0.046).Grupların toksisiteleri birbirinden farklı değildi, ancak hastaneye yatış FOLFIRINOX grubunda istatistiksel olarak daha yüksek olduğu belirlendi.

Sonuç: Çalışma, hastalık kontrol değerleri ve advers olaylar açısından üç rejim arasında bir fark olmadığını ortaya koydu; ancak yaşlı pankreas kanseri hastalarında sisplatin / gemsitabin kombinasyonu ile genel sağ kalım artışı gösterildi.

Anahtar Sözcükler: Pankreas kanseri; Tedavi; Geriatri.

INTRODUCTION

Pancreatic cancer (PC) is the seventh leading cause of cancer deaths, with 458,918 new cases and 432,242 new deaths in 2018 (1). It is most commonly diagnosed in elders aged >65 years (2). Most of the patients are unresectable and resistant to targeted therapies and immunotherapies (3, 4). Main treatment options for advanced PC are still cytotoxic chemotherapeutic regimens (5). Gemcitabine became the standard first-line regimen in advanced PC since Burris et al. showed improved median overall survival (m OS) (6). Addition of cisplatin to gemcitabine and new treatment combinations have been investigated (7-10).

Age-specific incidence of PC is increasing among patients >70 years of age but clinical trials, even in new trials, excluded or included very few patients older than 70 years of age (7-10). Elderly patients with advanced PC are frequently undertreated due to comorbidities, age, lack of evidence-based clinical practice guidelines for senior patients and patient's or physician's preference (11, 12). Although clinical benefits have been demonstrated with combination therapies (7, 9, 10), older patients are still being treated mostly with single-agent chemotherapy or best supportive care. There are few reports that compare the efficacy and safety of first-line monotherapy and combination therapies in older patients.

The present study aimed to compare efficacy and toxicity profiles of three different chemotherapy regimens in patients with advanced PC aged ≥65 years. The second aim was to describe prognostic factors affecting OS or PFS in patients with advanced PC aged ≥65 years. From this point of view, new studies investigating different dosages and combinations of chemotherapy are necessary for determining the best treatment choice.

MATERIALS AND METHOD

Study design and patients

This retrospective study was conducted at single medical oncology centre in Turkey. The study protocol was approved by the local ethics committee (Approval No: 12/12, dated 05/02/2019). Patients of an age >65 years with histologically confirmed metastatic pancreatic adenocarcinoma not amenable to curative surgical resection were included in the study. Treatments with FOLFIRINOX [oxaliplatin (85 mg/m^2), irinotecan (180 mg/m^2), 5-FU (400 mg/m^2 bolus and 2400 mg/m^2 46-hour continuous infusion) and leucovorin (400 mg/m^2) biweekly], cisplatin–gemcitabine (cisplatin 70 mg/m^2 on day 1 and gemcitabine 1000 mg/m^2 weekly on day 1 and 8 in every 21-day cycle) or only gemcitabine (1000 mg/m^2 once a week for 2 weeks in 3-week cycles) were compared. Treatments were continued until any progression or development of an adverse event. No prior systemic therapy or radiotherapy was allowed. Brain metastases were included unless symptomatic. Primary tumour resections (PTRs) were not excluded if there was measurable extra-pancreatic disease. Adequate haematological, hepatic and renal functions were also required. Data of 47 patients treated between July 2013 and September 2018 were included. Patients were analysed in three treatment groups: those who received FOLFIRINOX were considered as group A, those who received cisplatin–gemcitabine were group B and those who received only gemcitabine were group C. OS, defined as the time from diagnosis to death, was the primary endpoint of the study. Secondary endpoints were PFS, response rates and adverse events. PFS is defined as the time from first treatment date to documented progression or death. Disease control rate (DCR) is defined as the sum of the partial response, stable disease and complete response.

Radiological response was assessed in every 3 cycles or in case of finding a clinical progression using Response Evaluation Criteria in Solid Tumours (version 1.1).

Toxicity was assessed in every cycle. Toxic effects were graded according to Common Termi-

nology Criteria for Adverse Events which was used at the time of treatment.

Statistical methods

Statistical analysis was done using IBM SPSS Statistics for Windows, Version 23.0 (IBM Corp., Armonk, NY). The normality assumptions were controlled by the Shapiro–Wilk test. Descriptive analyses were presented using median (min–max) or n (%), where appropriate. Categorical data were analysed using Pearson's chi-squared test. The Kruskal–Wallis test was used for comparison of non-parametric variables between groups. OS and PFS were estimated using the Kaplan–Meier method. The log-rank test was used to compare the survival differences. Univariate and multivariate analyses were performed using the Cox proportional hazards regression model to explore prognostic factors for PFS and OS. The variables which showed significant association with OS or PFS in the univariate analyses were further tested in the multivariate model. Hazard ratios (HRs), with corresponding 95% confidence intervals (95% CIs), were reported. A p-value of <0.05 was considered statistically significant.

RESULTS

Patient demographics

The baseline characteristics of 47 patients are outlined in Table 1. Age (p=0.603), gender (p=0.296), Eastern Cooperative Oncology Group performance status (ECOG PS) (p=0.088), tumour size (p=0.559) and metastatic areas were similar in the three treatment groups (Table 1). Most of the tumours were located in the pancreatic head region (55.6%) and did not differ in the three groups (p=NA). PTR was performed in 55.3% of patients. Groups B and C had more PTR cases than group A (62.5% vs 73.3% vs 31.3%, respectively; p=0.048). Median number of treatment cycles of groups were similar [4 cycles (range 1–12) in group A, 4 cycles (range 1–8) in group B and 2 cycles (range 1–6) in group C; p=0.345]. Number of patients who received second-line chemotherapy after progression were similar in the three groups (p=NA) and constituted 27.7% of patients. The most commonly used second-line treatment was the nab-paclitaxel/gemcitabine combination (58.3%), followed by FOLFIRINOX (25%) and cisplatin–gemcitabine (16.7%) combination treatments.

Efficacy

DCRs were similar in groups B and C, which were higher than that in group A (p=NA) (Table 2). The median OS (m OS) was 11 months in group A, 17 months in group B and 8 months in group C (p=0.164). The median PFS (m PFS) was 3 months in group A, 6 months in group B and 4 months in group C (p=0.193) (Table 2, Figure 1). Patients <70 years of age had a longer m OS (p=0.028). PTR improved both m OS (p=0.006) and m PFS (p 0.001) (Table 3). Gender (p=0.918), ECOG PS (p=0.789), tumour localisation (p=0.213), lymphovascular invasion (p=0.178), perineural invasion (p=0.734), lung metastases (p=0.827), brain metastases (p=0.872), bone metastases (p=0.420) and lymph node metastases (p=0.599) did not affect the OS. Patients who received second-line treatment had a longer OS (16 months; 95% CI, 13.74–18.26) than that of those who did not (7 months; 95% CI, 5.44–8.56) (p=0.031), but second-line chemotherapy type did not show any difference on behalf of OS. Patients who received nab-paclitaxel and gemcitabine as second-line treatment had an m OS of 17 months (95% CI, 9.3–24.7); those who received FOLFIRINOX had an m OS of 17 months (95% CI, 15.4–18.6) and those who received cisplatin and gemcitabine had an m OS of 11 months (95% CI, NA) (p=0.198). Survivals were also not influenced by adverse events except febrile neutropenia (Table 3).

Prognostic factors affecting Progression Free Survival

Multivariate Cox proportional hazards model was performed to define the factors independently influencing PFS. Primary tumour resection (PTR)

was predicted to have a better PFS (HR: 0.128; 95% CI, 0.042–0.388, p<0.001). Age (p=0.155), tumour size (0.229), grade (0.978), liver involvement (p=0.319), first line chemotherapy cycle (p=0.118), febrile neutropenia (FEN) adverse events (p=0.230) were not found independently prognostic for PFS.

Prognostic factors affecting Overall Survival

Multivariate Cox proportional hazards model was performed to define the factors independently influencing OS. Age, PTR, tumour grade and use of second-line chemotherapy were not found to be independently prognostic of OS (p=0.469, 0.214, 0.189 and 0.065, respectively). Patients who had liver metastases were predicted to have a worsened overall survival (HR=3.251; 95% CI, 1.021–10.351, p=0.046). Patients who were administered more than 4 cycles of first-line chemotherapy had better overall survival (HR=0.327; 95% CI, 0.119–0.898, p=0.030). Use of cisplatin–gemcitabine chemotherapy was predicted to have better overall survival with regard to FOLFIRINOX (HR=0.213; 95% CI, 0.065–0.699, p=0.011). Multivariate analysis showed significant results in cisplatin + gemcitabine arm, but no difference was observed between groups in univariate analysis. This is thought to be due to presence of interactions which is part of suppression of one variable by another.

Adverse events

Table 4 summarises the adverse events. The main differences between the three groups were observed in the incidence of Grade 3–4 neutropenia; Grade 3–4 thrombocytopenia and febrile neutropenia. However, the statistical significance of these differences was not applicable. There were more frequent hospitalisations due to treatment toxicity in group A compared with that in groups B and C (p=0.018).

DISCUSSION

Treatment of advanced PC has improved recently. Kuroda et al. (12) reported 895 patients with unresectable PC, which included 659 elderly patients aged ≥65 years. They found that the median survival was shorter in the elderly group as compared to that in the younger group (181 vs 263 days, p=0.0001). Only 52.2% of elderly patients received chemotherapy, and in the treated subgroup, median survivals were not much different in elderly and younger groups (274 vs 333 days, p=0.09). This trial supported the idea that elderly patients with PC were able to benefit from and tolerate the treatments similar to the young people. Historic agent gemcitabine showed more clinical benefits/symptom relief and modest survival improvement with minimal toxicities (6) compared with 5-FU, even in fragile patients. Later, all new agents and combination treatments were compared to this historic gemcitabine monotherapy. A recent PRODIGE-4 trial (9) showed an improvement in m OS in the FOLFIRINOX arm compared to that in gemcitabine (m OS 11 vs 6.8 months, respectively; HR for death, 0.57; 95% CI, 0.45–0.73; p<0.001), and an MPACT trial (10) proved the first-line superiority of nab-paclitaxel/ gemcitabine over gemcitabine (m OS 8.5 vs 6.7 months, respectively; HR for death, 0.72; 95% CI, 0.62–0.83; p<0.001), which changed the standard treatment to combination therapies. However, these intensive chemotherapies were considered in fit patients who comprised only a small portion of the elderly group. In addition, 28% of elderly patients accrued to PRODIGE-4, in which elderly patients were under-represented and which could not report any data about safety of nab-paclitaxel/gemcitabine in elderly patients. However, 42% of patients accrued to MPACT were older than 65 years and could report acceptable toxicity in elderly patients (10).

Although there are many investigations for the best first-line chemotherapeutic option with a small survival benefit in advanced PC, it is still controversial and undetermined for the elderly patients. There are no guidelines for treatment in elderly patients with PC because the likelihood of

receiving standard chemotherapy is lower than in younger patients (13). To balance the toxicity and treatment advantage in elderly patients with advanced PC, proper treatment agents should be chosen, and dose reductions or delays and supportive treatments should be applied, if necessary. The knowledge about chemotherapy in elderly patients with advanced PC was obtained from retrospective, post-hoc and subset analysis of investigations. PAMELA70 is an ongoing phase II multicentre prospective trial enrolling chemo-naïve elderly patients with advanced PC, in which efficacy and tolerance of dose-adjusted FOLFIRINOX will be evaluated (14).

The cisplatin–gemcitabine combination has been tested in several studies (7, 8, 15-20). The GOIM study (7) first described the cisplatin–gemcitabine combination and reported an increased overall response rate (ORR) from 9.2% (95% CI, 3–20) with gemcitabine to 26.4% (95% CI, 15–40) (p=0.02) with the combination. Median OS (p=0.43) and toxicities were similar. GIP-1 study (15) tested the same regimens in 2010 and found no benefit in survival with the combination treatment. Italian GISCAD study investigated cisplatin 35 mg/m^2–gemcitabine 1000 mg/m^2 weekly for 2 consecutive weeks out of every 3 weeks. They reported an ORR of 9% (95% CI, 10–11) with an m OS of 5.6 months (17). Another German study researched different dosages of cisplatin–gemcitabine combination and showed insignificant survival advantages with combination when compared to gemcitabine monotherapy (8).

To our knowledge, our study is the first study in the literature which compares the toxicity and efficacy of FOLFIRINOX versus cisplatin–gemcitabine combination versus gemcitabine monotherapy schedules in elderly patients with PC. In the present study, cisplatin–gemcitabine combination showed a favourable outcome (17 months of m OS and 25% of DCR) compared with FOLFIRINOX (11 months of m OS and 6.2% of DCR) and gemcitabine monotherapy (8 months of m OS and 26.7% of DCR); however, the difference was not significant (p=0.164) by using the Kaplan–Meier method. But by using the Cox proportional hazards regression model, preformation of cisplatin–gemcitabine chemotherapy was predicted to have better overall survival with regard to FOLFIRINOX (HR: 0.213; 95% CI, 0.065–0.699, p=0.011).

Grade 3–4 neutropenia, Grade 3–4 FEN, Grade 3–4 thrombocytopenia and Grade 1–2 sensory neuropathy frequencies were unsignificantly increased but hospitalisations due to toxicities were significantly increased in the FOLFIRINOX treatment group. A retrospective single-centre trial reported FOLFIRINOX as a feasible regimen with comparable survival in PC and colorectal cancer patients aged 70 or above (21). However, it was also reported that 75% of patients had reduction in chemotherapy doses, 67% of patients experienced diarrhoea and 38.5% of patients had stopped treatment due to severe toxicities. The present study showed 11 months of m OS in FOLFIRINOX group, which is comparable with the previous studies, but increased febrile neutropenia, diarrhoea and sensory neuropathy has also been reported with the FOLFIRINOX group (9, 10, 15, 17, 21).

Guion-Dusserre et al. (21) reported none of the geriatric parameters (age, comorbidities, ECOG PS) were limiting factors for chemotherapy use and survival. In our study only PTR was associated with better PFS and only liver metastases was found to be associated with worsened OS. Von Hoff et al (10) reported more advanced disease with liver involvement and poor ECOG PS had greatest risk reduction in death with combination chemotherapy. They also showed longer treatment duration with increased cumulative dose, had better effect on OS like our study.

Retrospective nature of the study and low numbers of patients are the limitations of our study, resulting in possible selective bias and under-reporting of toxicity.

In conclusion, optimum first-line treatment in elderly patients with advanced PC is not yet been defined. To our knowledge, the present study is the first one in literature to compare FOLFIRINOX, cisplatin–gemcitabine and gemcitabine. The present study revealed that the cisplatin–gemcitabine combination schedule had an improved OS and reasonable toxicities for elderly patients with advanced PC.

CONFLICT OF INTEREST

None.

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RESEARCH

FACTORS AFFECTING INTENSIVE CARE UNIT ADMISSION AND MORTALITY RATES OF GERIATRIC PATIENTS WHO UNDERGO EMERGENCY ABDOMINAL SURGERY

Abstract

Introduction: The number of geriatric patients undergoing emergency surgery is increasing worldwide. The objective of our study was to retrospectively review the intensive care unit (ICU) admission rates, mortality rates and the mortality risk factors in geriatric patients undergoing emergency abdominal surgery.

Materials and Method: The data of patients who underwent emergency abdominal surgery between January 2014 and August 2018 were retrospectively reviewed. Patients were classified into Group-I (≥75 years) and Group-II (65–74 years). American Society of Anesthesiologists (ASA) physical status, haemoglobin values, whether preoperative cardiac examinations were conducted, ICU admission and mortality rates were recorded. The two groups were compared in terms of ICU admission rates, ICU and in-hospital mortality rates and the factors affecting these parameters.

Results: A total of 109 patients were included in the study with 71 (65.1%) being in Group-I and 38 (34.9%) in Group-II. ICU admission rate and in-hospital mortality rates were higher in Group-I than those in Group-II. High ASA score in Group I and high ASA score and low haemoglobin value in Group-II affected ICU admission rate. It was observed that the absence of preoperative cardiac examination increased ICU mortality in Group-I. High ASA scores in both the groups increased in-hospital mortality. In addition, postoperative ICU admission rate increased in-hospital mortality in Group-II.

Conclusion: ASA score was found to be the most important factor affecting mortality rates in geriatric patients after emergency surgery. It was concluded that ICU mortality rates can be decreased by utilising necessary treatment protocols by performing preoperative cardiologic examinations geriatric patients aged >75 years.

Keywords: Geriatrics; Morbidity; Mortality; General Surgery.

ARAŞTIRMA

ACİL ABDOMİNAL CERRAHİ GEÇİREN YAŞLI HASTALARDA YOĞUN BAKIMA YATIŞ VE MORTALİTE ORANINI ETKİLEYEN FAKTÖRLER

Öz

Giriş: Günümüzde acil cerrahi geçiren yaşlı hasta sayısı artmaktadır. Çalışmamızın amacı acil abdominal cerrahi geçiren geriatrik hastaların yoğun bakıma yatış oranlarının, mortalite oranlarının ve mortalite risk faktörlerinin retrospektif olarak incelenmesidir.

Gereç ve Yöntem: Ocak 2014-Ağustos 2018 tarihleri arasında acil abdominal cerrahi geçiren hastaların bilgileri retrospektif olarak tarandı. Hastalar yaş gruplarına göre Grup-I (75 yaş ve üstü), Grup-II (65-74 yaş) olarak ayrıldı. American Society of Anesthesiologists (ASA) fiziksel durum skorları, hemoglobin değerleri, preoperatif kardiyak muayene yapılıp yapılmadığı, yoğun bakım ünitesine giriş durumları, mortalite değerleri kaydedildi. İki grup yoğun bakım yatışları, yoğun bakım ve hastane içi mortalite değerleri ve bu durumları etkileyen faktörler açısından karşılaştırıldı.

Bulgular: Çalışmaya Grup-I'de 71 (%65,1) ve Grup-II'de 38 (%34,9) üzere toplam 109 hasta dahil edildi. Grup-I'de yoğun bakıma yatış ve hastane içi mortalite değerleri daha yüksekti. Grup-I'de yüksek ASA skoru, Grup-II'de ise ASA skoru ve hemoglobin düşüklüğü yoğun bakıma yatışta etkiliydi. Grup-I'de preoperatif kardiyak muayene yapılmamasının yoğun bakım mortalitesini arttırdığı görüldü. Her iki grupta yüksek ASA skorunun hastane içi mortaliteyi artırdığı, ayrıca Grup-II'de postoperatif yoğun bakıma çıkışın da hastane içi mortaliteye etkisi olduğu bulundu.

Sonuç: Yaşlı hastalarda acil cerrahi sonrası yoğun bakım yatışı ve mortaliteyi etkileyen en önemli faktör ASA skoru olarak bulundu. Yetmiş beş yaş üstü hastalarda preoperatif kardiyolojik muayene yapılarak gerekli tedavi protokollerinin uygulanmasının yoğun bakım mortalite değerini azaltabileceği sonucuna varıldı.

Anahtar Sözcükler: Cerrahi; Morbidite; Mortalite; Yaşlılık.

INTRODUCTION

Life expectancy has increased owing to advances in the diagnosis and treatment of chronic diseases. More than half of the surgical procedures requiring hospitalisation are performed on patients aged ≥65 years (1). The number of geriatric patients undergoing emergency abdominal surgery has increased because of increased lifespan, and more patients in this age group undergo emergency abdominal operations than patients in younger age groups (1, 2). In geriatric patients, a decrease in physical reserves and an increase in the incidence of comorbidities are observed. Moreover, patients undergoing emergency abdominal surgery are often operated without adequate preoperative preparation and thus have a high risk of anaesthesia. Emergency surgery is associated with higher mortality and morbidity rates than elective surgery. Reportedly, the risk of mortality related to surgery increases by two times in geriatric patients who undergo emergency abdominal surgery (3).

The objective of our study was to retrospectively review intensive care unit (ICU) admission rates, ICU and in-hospital mortality rates and the risk factors of mortality in patients aged 65-74 years and those aged ≥75 years who underwent emergency abdominal surgery at our hospital.

MATERIALS AND METHOD

After obtaining the approval of the hospital Scientific Studies Board (FSM SSB 2018/9-17958), the data of patients who presented to our hospital and subsequently underwent emergency abdominal surgery between January 2014 and August 2018 were retrospectively reviewed using a computer system. Age, sex, chronic diseases, ASA status, pre- and postoperative haemoglobin (Hb) and sodium values, aetiology and surgery types, time when surgery was conducted (08:00–16:00, 16:00–24:00 and 24:00–08:00), whether preoperative cardiac examination was performed, ICU admission status, the length of ICU stay, hospitalisation duration, postoperative complications (sepsis, anastomotic leakage, acute kidney failure, pneumonia, delirium and wound site infection), ICU and in-hospital mortality rates and mortality days were recorded.

The patients were categorised into two groups according to their age: Group I (≥75 years) and Group II (65–74 years); the two groups were compared in terms of ICU stay, ICU and in-hospital mortalities and the factors affecting these situations. Four patients in Group I were transferred to ICUs in external facilities after operation, and thus, the ICU follow-up data of these patients could not be analysed.

Statistical analyses

Data were statistically analysed using the IBM SPSS Statistics 22 (IBM SPSS, Turkey) software. The Shapiro–Wilk test was used to assess whether the parameters were normally distributed. Along with descriptive statistics (mean, standard deviation and frequency) of the study data, the Kruskal–Wallis test was used for inter-group comparison of qualitative data without normal distribution. The student's t-test was used for the comparison of parameters with normal distribution between the two groups, and the Mann–Whitney U test was used for the comparison of parameters without normal distribution between the two groups. For the comparison of quantitative data, the Chi-square test, Fisher's exact test, Fisher–Freeman–Halton test and Yates's correction for continuity were used. Pearson's correlation coefficient was used to evaluate the relationship between the parameters that followed normal distribution, and Spearman's rank correlation coefficient was used for analysing the relationship between parameters that did not follow normal distribution. The level of statistical significance was set at $p < 0.05$.

RESULTS

A total of 109 patients were included in the study, with 71 (65.1%) in Group I and 38 (34.9%) in Group

II. The mean age of the patients was 78±7.3 years. Demographic characteristics and chronic diseases of the patients in the two groups are summarised in Table 1. Thirty-five patients (%49,2) in Group I and 13 patients (%34,2) in Group II underwent pre-operative cardiac examination (p=0,131). There was no difference between the groups in terms of the aetiology of acute abdomen and surgery types (Table 2).

Table 1. Demographic characteristics and chronic diseases of the enrolled patients.

Variable		Group I	Group II	p
		Mean±sd	Mean±sd	
Age (years)		82.62±4.4	69.61±2.47	10,000*
ASA score (median) 1 2 3 4 5		 2 3 21 42 3	 1 6 17 12 2	20,014*
Gender n (%)	Male	35 (49.3 %)	25 (65.8 %)	30.148
	Female	36 (50.7 %)	13 (34.2 %)	
HT n (%)		56 (78.9 %)	23 (60.6 %)	30.103
DM n (%)		15 (21.2 %)	9 (23.7 %)	30.922
CHF n (%)		19 (26.8 %)	3 (7.9 %)	30.039*
CAD n(%)		13 (18.3 %)	6 (15.8 %)	30.970
ARF n (%)		3 (4.3 %)	5 (13.2 %)	40.122
CRF n (%)		10 (14.1 %)	1 (2.6 %)	40.093
COPD n (%)		11 (15.5 %)	9 (23.7 %)	30.409
Asthma n (%)		3 (4.2 %)	1 (2.7 %)	41.000
Alzheimer's disease n (%)		9 (12.7 %)	0 (0 %)	40.026*
Parkinson's disease n (%)		2 (2.8 %)	2 (5.3 %)	40.608
CVA n (%)		6 (8.6 %)	1 (2.6 %)	40.418

[1]Student's t-test; [2]Mann–Whitney U test; [3]Yates's correction for continuity; [4]Fisher's exact test; *p<0.05

HT: Hypertension, DM: Diabetes Mellitus, CHF: Congestive heart failure, CAD: Coronary artery disease, ARF: Acute kidney failure, CRF: Chronic kidney failure, COPD: Chronic obstructive pulmonary disease, CVA: Cerebrovascular accident.

Table 2. Aetiologies of acute abdomen and surgery types of patients.

Variable		Group I	Group II	p
		n (%)	n (%)	
Aetiology	Incarcerated hernia	9 (12.7 %)	4 (10.5 %)	0.164
	Colon perforation	9 (12.7 %)	4 (10.5 %)	
	Mesenteric ischaemia	6 (8.5 %)	1 (2.6 %)	
	Obstructive colon/ rectum tumour	24 (33.8 %)	10 (26.3 %)	
	Volvulus	6 (8.5 %)	2 (5.3 %)	
	Peptic ulcer perforation	6 (8.5 %)	10 (26.3 %)	
	Ileus	7 (9.9 %)	5 (13.2 %)	
	Ischaemic colitis perforation	1 (1.4 %)	0 (0 %)	
	Abdominal pain of unknown origin	3 (4.2 %)	0 (0 %)	
	GIT bleeding	0 (0 %)	2 (5.3 %)	
Surgery type	Small intestine resection	19 (26.8 %)	6 (15.8 %)	0.077
	Colon resection	30 (42.3 %)	15 (39.5 %)	
	Primary repair	10 (14.1 %)	10 (26.3 %)	
	Bridectomy	0 (0 %)	2 (5.3 %)	
	Diagnostic laparotomy	3 (4.2 %)	0 (0 %)	
	Stomal opening	7 (9.9 %)	2 (5.3 %)	
	Colopexy	1 (1.4 %)	0 (0 %)	
	Gastrectomy	0 (0 %)	2 (5.3 %)	
	Enterostomy	1 (1.4 %)	1 (2.6 %)	

Fisher–Freeman–Halton test; *$p < 0.05$, GIT: Gastrointestinal tract

Older geriatric patients (≥75 years; 48.6%) most frequently underwent surgery between 16:00 and 00:00 h, whereas younger geriatric patients (65-74 years) most frequently (43.2%) underwent surgery between 08:00 and 16:00 h, but the time when surgery was conducted was statistically similar between the groups (p=0.646). Intraoperative death was not observed. While Hb values were similar in the preoperative period (12.1±2.4 g/dl vs 13.1±2.7 g/dl, p=0.05), postoperative Hb values were lower in Group I than those in Group II (10.7±1.7 g/dl vs 11.8±1.9 g/dl, p=0.004), respectively. Pre- and postoperative sodium values of the two groups were similar.

In total, 73.2% and 36.8% of the patients in Group I and II, respectively, were admitted to ICU after operation (p=0.001). The length of ICU stay, hospitalisation duration, mortality status and mortality days of the patients are summarised in Table 3. The overall mortality rate was 30.2%.

In intra-group analysis, ASA score in Group I (p=0.007) and ASA score and pre- and postoperative Hb values (p=0.008, p=0.003 and p=0.005, respectively) in Group II were significant factors affecting ICU admission.

Among the older geriatric patients, ICU mortality rate was not affected by ASA score, preoperative congestive heart failure, Alzheimer's disease, aetiology of acute abdomen, operation time and pre- and postoperative Hb and sodium values. Moreover, not having undergone preoperative cardiac examination increased ICU mortality rate (p=0.016), whereas in Group II, none of these factors affected ICU mortality rate. When the same parameters were analysed, it was observed that high ASA scores increased in-hospital mortality rate in both the groups (p=0.007 and p=0.0038, respectively); moreover in Group II, postoperative ICU admission affected in-hospital mortality rate (p=0.001).

Table 3. Postoperative ICU admission, length of ICU stay, hospitalisation duration, mortality status and mortality days of patients.

Variable		Group I	Group II	p
		Mean±sd (median)	Mean±sd (median)	
ICU admission n (%)		52 (73.2 %)	14 (36.8 %)	[1]0.001*
ICU stay (days)		9.4±19.35 (3)	3.83±3.27 (3)	[2]0.955
ICU mortality n (%)	Yes	15 (31.3 %)	5 (35.7 %)	[3]0.755
ICU mortality days		10.33±15.65 (2)	4.8±4.97 (2)	[2]0.855
Hospitalisation duration		16.1±17.21 (11)	16.54±31.79 (9)	[2]0.259
In-hospital mortality n (%)		27 (40.3 %)	6 (15.8 %)	[4]0.009*
Mortality day		15.18±19.22 (10)	6.17±5.19 (5.5)	[2]0.324

[1]Yates's correction of continuity; [2]Mann–Whitney U test; [3]Fisher's exact test; [4]Chi-square *p < 0.05

ICU: Intensive care unit

The rate of postoperative complications among the patients without mortality was found to be 25% in older geriatric patients and 18,7% in younger geriatric patients with no statistically significant difference between the groups (Table 4).

Table 4. Postoperative complications among the patients without mortality.

Variable		Group I	Group II	p
		n (%)	n (%)	
Complications	None	30 (75 %)	26 (81.3 %)	0.592
	Anastomotic leakage	1 (2.5 %)	3 (9.4 %)	
	Pneumonia	4 (10 %)	1 (3.1 %)	
	Delirium	1 (2.5 %)	0 (0 %)	
	Evisceration	1 (2.5 %)	0 (0 %)	
	Wound site infection	2 (5 %)	2 (6.2 %)	
	Respiratory distress	1 (2.5 %)	0 (0 %)	

Fisher's exact test

DISCUSSION

In our study comparing younger geriatric (65–74 years) and older geriatric (≥75 years) patients undergoing emergency abdominal surgery, it was observed that ASA score, ICU admission rate and in-hospital mortality rate were higher among older geriatric patients. It was observed that high ASA score increased ICU admission and in-hospital mortality rates in older geriatric patients. Low pre- and postoperative Hb values, along with high ASA scores, increased ICU admission rate; high ASA scores and admission to the ICU affected in-hospital mortality rate in younger geriatric patients.

Geriatric patients comprise a significant portion of patients undergoing emergency abdominal surgery. Emergency abdominal surgery in this patient group is associated with increased morbidity and mortality rates owing to decreased physiological reserves and the presence of comorbidities. Arenal et al. reported a mortality rate of 22% in a study involving patients aged ≥70 years who underwent emergency abdominal surgery, and this rate was as high as 58% among patients who underwent non-therapeutic laparotomy (4). In the present study, the overall mortality rate was found to be 30.2%. It is well known that advanced age is the sole, independent risk factor of mortality in patients who undergo abdominal surgery (5). In a previous study, patients aged >65 years were categorised into three groups: those aged 65–74, 75–84 and ≥85 years; it was shown that mortality rate increases for all surgery types with increasing age (6). Moreover, in the present study, in-hospital mortality rate was higher in older geriatric patients than that in younger geriatric patients.

Although ICU admission rate was higher among older geriatric patients, ICU mortality rates were similar between older and younger geriatric patients. The evaluation of the ASA status prior to administering anaesthesia is very crucial. Reportedly, ASA score is an independent risk factor of mortality after emergency abdominal surgery in geriatric patients (4, 7). A study involving patients aged >80 years demonstrated that ASA score is inadequate in evaluating the risk of colorectal surgery, while a similar study reported that P-POSSUM score combined with frailty scales can better evaluate the risk factors of mortality after emergency laparotomy (8, 9). In our study, it was observed that high ASA score increased in-hospital mortality rate in both the groups. Another factor affecting mortality in younger geriatric patients was ICU admission rate. This finding is linked to high ASA score, which increases ICU admission rate and ICU complications, such as infections, possibly occurring during ICU stay. The difference between the two groups was attributed to high ICU admission rates among the older geriatric patients with high ASA scores and ICU admission of younger geriatric patients with a higher risk than the general population of younger geriatric group.

Cardiopulmonary functions decline with increasing age; thus, comprehensive preoperative evaluation becomes more important. The evaluation of preoperative cardiac risks is important for the estimation of possible perioperative cardiac complications and for the adoption of a suitable treatment approach (10). Despite the improvements in perioperative care, significant morbidity and mortality are observed among the patients with congestive heart failure (11). In our study, history of congestive heart failure rate was higher among older geriatric patients than that among younger geriatric patients; however, there was no relationship between heart failure and ICU and in-hospital mortality rates. Providing necessary medical consultation in the preoperative period to patients who are undergoing emergency surgery is not always possible. In our routine clinical practice, cardiac evaluations of the patients are done according to ''ESC/ESA Guidelines on non-cardiac surgery: cardiovascular assessment and management" (12). In the present study, it was observed that not undergoing preoperative cardiac examination increased ICU mortality rate. While an increase in mortality was not observed with suitable monitoring and medical and fluid therapies in patients with known congestive heart failure, it was concluded that among patients who did not undergo preoperative cardiac examination, ICU mortality increased due to the inability to detect hidden heart failure and thus the inability to perform cardiac optimisation.

Anaemia is commonly observed in geriatric patients, and its prevalence increases with age after 65 years of age (13). In our study, while there was no significant difference in preoperative Hb values between the two groups (p=0.05), postoperative Hb values were lower in older geriatric patients than those in younger geriatric patients. However, low Hb value in older geriatric patients did not affect ICU admission, ICU mortality and in-hospital mortality rates. In a study of patients with a median age of 66 years undergoing hiatal hernia repair, it was shown that ICU admission rate increases if Hb value is <12 g/dl in females and <13 g/dl in males (14). In our study, low pre- and postoperative Hb values increased ICU admission rates among younger geriatric patients. It is considered that the detection of the treatable causes of anaemia and the use of available medical therapy protocols may be effective in decreasing ICU admission rates in younger geriatric patients who undergo elective surgery, although such an approach may not be practical in patients who undergo emergency surgery.

In the present study, no significant difference was observed between the two groups in terms of complications. In a study of patients aged >80 years, pneumonia (12.8%) was reported as one the most common complications occurring after

undergoing emergency abdominal surgery (15). Another study reported that the rate of postoperative pneumonia development was 11.4% among patients aged >70 years who underwent emergency abdominal surgery (4). In our study, the most common postoperative complication among older geriatric patients was pneumonia with the incidence (10%) being similar to that reported in previous studies. Reportedly, advancing age is associated with the deterioration of deglutition functions and the slowing of gastric emptying (16). The high prevalence of pneumonia in the postoperative period in older geriatric patients is attributed to the aforementioned physiological changes and an increased risk of aspiration due to acute gastrointestinal events.

The limitations of the study include its retrospective design, which is associated with the uneven distribution of patients in terms of number, and the inability to use scoring systems other than ASA in preoperative evaluation.

In conclusion the most important factor affecting ICU admission and postoperative mortality rates among patients aged >65 years was found to be ASA status. Moreover, anaemia appeared as a risk factor affecting ICU admission in patients aged 65–74 years. Treatment of anaemia prior to elective surgery in this age group can be beneficial in decreasing ICU admission rate and thus decreasing in-hospital mortality. As an absence of preoperative cardiac examination increases ICU mortality in older geriatric patients (≥75 years), it was concluded that preoperative cardiac examination and intra- and postoperative cardiac optimisations among patients aged ≥75 years can decrease ICU mortality rates.

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RESEARCH

THE PROGNOSTIC ROLE OF NEUTROPHIL-TO-LYMPHOCYTE AND PLATELET-TO-LYMPHOCYTE RATIOS IN PATIENTS WITH ASPIRATION PNEUMONIA

Abstract

Introduction: Aspiration pneumonia is difficult to diagnose, and it has a high mortality rate. In this study, the prognostic values of neutrophil-to-lymphocyte ratio (NLR) and platelet-to-lymphocyte ratio (PLR) and their association with intensive care unit (ICU) admission and mortality were investigated in patients with aspiration pneumonia.

Materials and Method: Between November 2016 and December 2018, 162 patients aged>40 years, with no immunosuppression or malignancy, and hospitalized with a diagnosis of aspiration pneumonia were included in this retrospective study. The patients were divided into two groups: those with and without ICU admission. In addition, the patients were divided into two groups: those who died and recovered. NLR and PLR ratios were compared between groups.

Results: Among the 162 patients, 87 (54%) were male and 75 (46%) were female, 72 patients were administered to the ICU, and 28 died. NLRs in patients admitted to the ICU (13.88±10.83) compared with those who were not admitted (10.5±10.07) and NLRs in patients who died (14.91±9.41) compared with those who recovered (11.4±10.67) were significantly high ($p<0.05$). There was no significant difference between the groups for PLRs ($p>0.05$). The NLR cutoff value was determined as 8, and sensitivity and specificity for admission to the ICU was 68.25% and 58.89%, respectively (AUC, 0.62), whereas sensitivity and specificity for mortality were 67.86% and 54.48%, respectively (AUC, 0.658).

Conclusion: NLR has a prognostic value in predicting ICU admission and mortality in patients with aspiration pneumonia.

Keywords: Aspiration pneumonia; Neutrophil; Lymphocyte; Platelet; Mortality; Intensive care unit.

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ARAŞTIRMA

ASPİRASYON PNÖMONİLİ HASTALARDA NÖTROFİL LENFOSİT ORANI VE PLATELET LENFOSİT ORANININ PROGNOZ İLE İLİŞKİSİ

Öz

Giriş: Aspirasyon pnömonisi, tanısı zor, mortalitesi yüksek bir hastalıktır. Bu çalışmada, aspirasyon pnömonili hastalarda, nötrofil lenfosit oranı (NLO) ve platelet lenfosit oranının (PLO), yoğun bakıma giriş ve mortalite ile ilişkili prognostik değerinin incelenmesi amaçlanmıştır.

Gereç ve Yöntem: Kasım 2016-Aralık 2018 tarihleri arasında başvuran, 40 yaş üzerinde, immünsüpresyonu ve malignitesi olmayan, aspirasyon pnömonisi tanısı konularak hastaneye yatırılan 162 hasta retrospektif olarak çalışmaya alındı. Hastalar yoğun bakıma yatış ve ex olmalarına göre iki ayrı gruba ayrıldı, bu gruplarda NLO ve PLO oranları karşılaştırıldı.

Bulgular: 162 hastanın 87'si (%54) erkek, 75'i (%46) kadındı. 72 hasta yoğun bakıma alınırken, 28 hasta öldü. NLO seviyeleri yoğun bakıma giren hastalarda (13.88±10.83), girmeyenlere (10.5±10.07) göre; ölen hastalarda (14.91±9.41), ölmeyenlere göre (11.4±10.67) istatistiksel olarak anlamlı yüksek saptandı ($p<0.05$). PLO seviyeleri açısından, gruplar arasında istatistiksel olarak anlamlı farklılık saptanmadı ($p>0.05$). NLO cut-off değeri 8 olarak saptanmış olup, yoğun bakıma giriş için sensitivite ve spesifitesi %68.25 ve %58,89 (AUC:0.62); mortalite için sensitivite ve spesifitesi %67.86 ve %54.48 saptandı (AUC:0,658).

Sonuç: Aspirasyon pnömonisi hastaların, NLO'nın yoğun bakıma giriş ve mortaliteyi öngörmede prognostik değeri olduğu saptandı.

Anahtar Sözcükler: Aspirasyon pnömonisi; Nötrofil; Lenfosit; Platelet; Mortalite; Yoğun Bakım.

INTRODUCTION

Aspiration is defined as inhalation of the oropharyngeal and gastric contents into the larynx and lower respiratory tract. After aspiration, different diseases develop depending on the content of the aspirated material, amount of aspiration, and response of host. In young patients, aspiration pneumonitis (Mendelson's syndrome) develops because of aspiration of sterile gastric contents, but aspiration pneumonia develops in elderly patients because of aspiration of oropharyngeal material with bacterial colonization (1). The most common risk factors in elderly patients are impaired clearance, decreased cough reflex, and poor oropharyngeal secretion control (2). As the diagnostic criteria for aspiration pneumonia cannot be clearly established, a heterogeneous patient population is included in studies. It is reported that 5%–15% of community-acquired pneumonia are aspiration pneumonia (3). In another study, the incidence of aspiration pneumonia in patients with hospitalized community-acquired pneumonia ranged from 8.7% to 60.1% (4). Mortality was found to be three-fold higher in aspiration pneumonia (29.4%–11.6%) than in other forms of pneumonia (5). White blood cells (WBC) play an important role in the systemic inflammatory response triggered by infection. Due to endotoxemia, circulating neutrophils increase and lymphocyte count decreases (6). Zahorec R. et al. have published the first study reporting that the neutrophil-to-lymphocyte ratio (NLR) can be used as a marker for systemic infection (7). Another study has determined that NLR is more effective as an indicator of bacteremia than the classical parameters such as WBC, neutrophil count, and C-reactive protein (CRP) levels (8). Similarly, the platelet-to-lymphocyte ratio (PLR) has also been recognized as a useful marker of systemic inflammation (9).

The present study investigated the prognostic values of NLR and PLR and their association with intensive care unit (ICU) admission and mortality in patients diagnosed with aspiration pneumonia.

MATERIALS AND METHOD

Between November 2016 and December 2018, 162 patients diagnosed with aspiration pneumonia, hospitalized at Sultan Abdulhamid Han Training and Research Hospital, and were older than 40 years of age without immunosuppression and malignancy, were retrospectively included in the study. Informed consent was waived because of the retrospective nature of the study. This study was approved by the Ethics Committee of the Umraniye Training and Research Hospital (172/04.09.2019). The patients were divided into two groups: those with and without ICU admission. In addition, the patients were divided into two separate groups: those who died and recovered. The diagnosis of aspiration pneumonia was made according to the criteria described below:

a) New emerging radiographic infiltration suggestive of pneumonia,
b) Symptoms and signs of lower respiratory tract infection (one major criterion: cough, expectoration, fever>38 °C or<35.5 °C; two minor criteria: pleuritic chest pain, dyspnea, delirium, increased alveolar–arterial gradient, WBC>12000/mm^3, and/or left shift or leukopenia<3000/mm^3),
c) Presence of aspiration risk factors (confusion, swallowing reflex deterioration, diagnostic aspiration, gastroesophageal junction disorder, pharyngeal anatomical abnormalities) (2).

Age, sex, WBC, neutrophils, lymphocytes, platelets, CRP, room air saturation (SpO_2), radiological findings (single lobe, multilobar, and accompanying pleurisy presence), length of hospital stay, admission to the ICU during treatment, and mortality (survival or death) data were collected. NLR and PLR were calculated.

CRP levels were measured with full automated immunoturbidimetric method using Archem Diagnostics (Istanbul-Turkey) kit by Abbott Architect C-16000 Clinical Chemistry Analyzer (California-USA). The WBC count, neutrophil and

lymphocyte counts were determined on BC-6800 Hematology Analyzer (Mindray Corporation, China).

Descriptive analyses (frequency distributions, percentage, mean, standard deviation, and 95% confidence intervals) were used as statistical methods in analyzing the research data. Data were analyzed using the Chi-square test for normally distributed data, and the Mann–Whitney U test was used when the data was not normally distributed. Pearson's correlation coefficient, cutoff point, ROC curve, and sensitivity analysis were used to evaluate the relationships. The cutoff point for the hospitalization period was found using the K-means cluster method. The results were evaluated at 95% confidence interval and $p<0.05$ significance level. In the analysis of the data, the PSPP [PSPP is free software; you can redistribute it and/or modify it under the terms of the GNU General Public License as published by the Free Software Foundation, either version 3 of the license or (at your option) any later version] and Microsoft Excel computer programs were used.

RESULTS

A total of 162 patients were included in this study. The mean age of the patients admitted to the ICU was 81.60±9.99 years. Among the 162 patients, 72 were admitted to the ICU during hospitalization or treatment period and 28 died there.

Comparison of patients who were admitted and not admitted to the ICU

The mean age of the patients who were treated and not treated in the ICU was 82.19±8.02 and 81.13±11.34 years, respectively. There was no statistically significant difference between the two groups in terms of age ($p>0.05$). Overall, 37of the 87 male patients and 35 of the 75 female patients were admitted to the ICU, and no statistically significant difference was found between the groups in terms of sex ($p>0.05$). Similarly, no statistically significant difference was found between the groups in terms of WBC, neutrophils, lymphocytes, platelets, PLR, and radiological findings ($p>0.05$). Among 119 patients, 70 were hypoxic at the time of admission to the hospital and 2 of the remaining 43 non-hypoxic patients were admitted to the ICU. Significant differences were noted between the two groups in terms of hypoxia ($p<0.05$). The mean NLR in patients who were admitted and not admitted to the ICU was 13.83±10.83 and 10.5±10.07, respectively, and the difference was significant ($p<0.05$). The mean CRP levels were found to be 133.94±80.15 in patients admitted to the ICU and 102.91±63.88 in patients who were not admitted to the ICU, and the difference between the groups was significant ($p<0.05$). The length of hospital stay was 24.25±19.92 days for patients admitted to the ICU and 9.66±4.67 days for patients not admitted to the ICU; this difference was also significant ($p<0.05$) (Table 1).

Comparison of patients who died and recovered

The mean ages of the patients who died was 82.04±9.11 years and of those who did not die was 81.51±10.19 years. There were no significant differences between the groups in terms of age ($p>0.05$). Overall, 10 of the 87 male patients and 18 of the 75 female patients died. There was a statistically significant difference between the two groups in terms of sex ($p<0.05$). No statistically significant difference was found between the groups in terms of WBC, neutrophils, lymphocytes, PLR, CRP, and radiological findings ($p>0.05$). Among 119 patients who were hypoxic upon admission, 28 died; none of the remaining 43 non-hypoxic patients upon admission died, and the difference between the groups was significant ($p<0.05$). The mean platelet count was 206.22±100.1 in the mortality group and 248.55±91.39 in the survival group, and the difference was significant ($p<0.05$). The mean NLR was 14.91±9.41 in the mortality groups and 11.4±10.67 in the survival group, and the difference between the groups was

Table 1. Clinical baseline characteristics and infection markers in subgroups of patients admitted and not admitted to the ICU.

Clinical characteristics		No ICU admission (n=90)	ICU admission (n=72)	p
Sex	Male	50 (55.56%)	37 (51.39%)	0.59
	Female	40 (44.44%)	35 (48.61%)	
SpO_2	Hypoxia	49 (54.44%)	70 (97.22%)	0.0001
	Normal	41 (45.56%)	2 (2.78%)	
Radiologic findings	Multilobar	56 (62.22%)	35 (48.61%)	0.097
	Multilobar + PE	25 (27.78%)	33 (45.83%)	
	Single Lobe	5 (5.56%)	3 (4.17%)	
	Single Lobe + PE	4 (4.44%)	1 (1.39%)	
Age (year)		81.13±11.34	82.19±8.02	0.503
WBC (x 103/µL)		11.58±5.26	12.7±5.65	0.192
Platelet		238.97±87.74	244.06±101.86	0.734
Neutrophils		9.6±5.1	10.8±5.18	0.140
Lymphocytes		1.29±0.84	1 11±0.72	0.135
NLR		10.5±10.07	13 88±10.83	0.042
PLR		246.86±185.32	308.89±246.9	0.079
CRP		102.91±63.88	133.94±80.15	0.007
Hospital LOS (days)		9.66±4.67	24.25±19.92	0.0001

Note: Data are presented as mean±Standard deviation (SD)

Abbreviations: PE, pleural effusion; WBC, white blood cell; NLR, neutrophil-to-lymphocyte ratio; PLR, platelet-to-lymphocyte ratio; CRP, C-reactive protein; LOS, length of stay.

significant ($p<0.05$). The length of hospital stay was 32.14±26.98 days in patients who died and 12.8±8.8 days in patients who recovered, and this difference was significant ($p<0.05$) (Table 2).

There was a significant positive correlation between CRP and NLR ($r=0.18$; $p<0.05$). There was no statistically significant relationship between CRP and PLR ($r=-0.03$; $p>0.05$) (Table 3, Figure 1).

Table 2. Clinical baseline characteristics and infection markers in patients who died and recovered.

Clinical characteristics		Recovered (n=134)	Died (n=28)	p
Sex	Male	77 (57.46%)	10 (35.71%)	0.036
	Female	57 (42.54%)	18 (64.29%)	
SpO_2	Hypoxia	91 (67.91%)	28 (100%)	0.0001
	Normal	43 (32.09%)	0 (0%)	
Radiologic findings	Multilobar	78 (58.21%)	13 (46.43%)	0.62
	Multilobar + PE	45 (33.58%)	13 (46.43%)	
	Single lobe	7 (5.22%)	1 (3.57%)	
	Single lobe + PE	4 (2.99%)	1 (3.57%)	
Age (years)		81.51±10.19	82.04±9.11	0.68
WBC ($\times 10^3/\mu L$)		11.79±5.28	13.44±6.13	0.27
Platelet		248.55±91.39	206.22±100.1	0.04
Neutrophils		9.85±5.05	11.5±5.51	0.15
Lymphocytes		1.25±0.82	1.02±0.64	0.13
NLR		11.4±10.67	14.91±9.41	0.009
PLR		276.1±222.43	266.46±188.19	0.80
CRP		112.92±72.1	134.79±75.83	0.14
Hospital LOS (days)		12.8±8.8	32.14±26.98	00001

Note: Data are presented as mean±Standard deviation (SD)

Abbreviations: PE, pleural effusion; WBC, white blood cell count; NLR, neutrophil-to-lymphocyte ratio; PLR, platelet-to-lymphocyte ratio; CRP, C-reactive protein; LOS, length of stay.

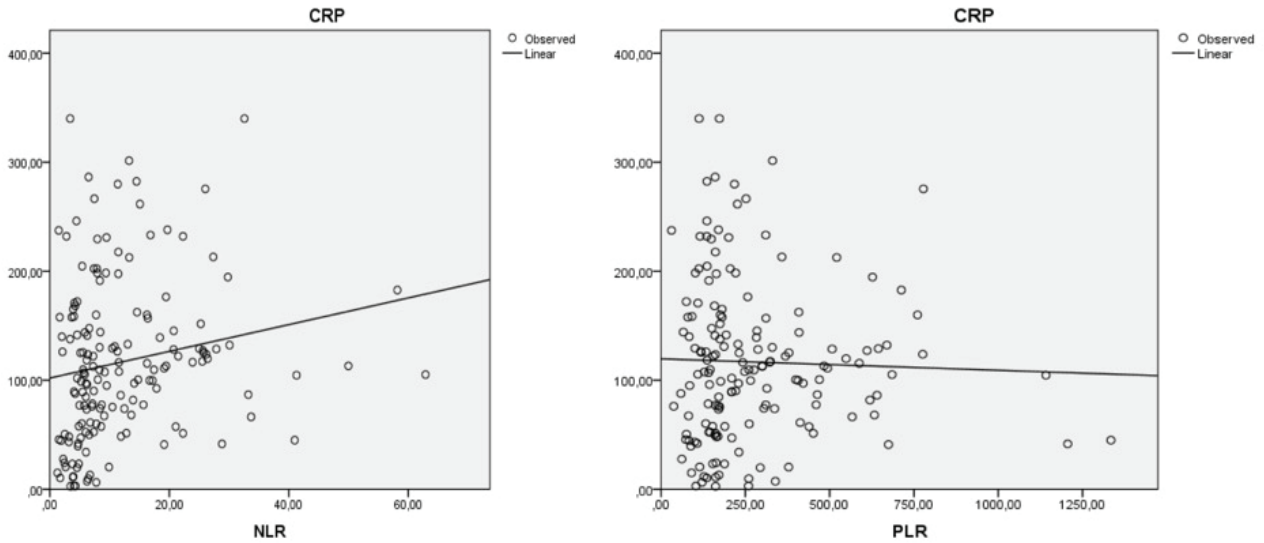
Table 3. .Correlations of the NLR and PLR with CRP

		NLR	PLR
CRP	r*	0.176*	−0.031
	p	0.025	0.695
	N	162	162

*Pearson's correlation

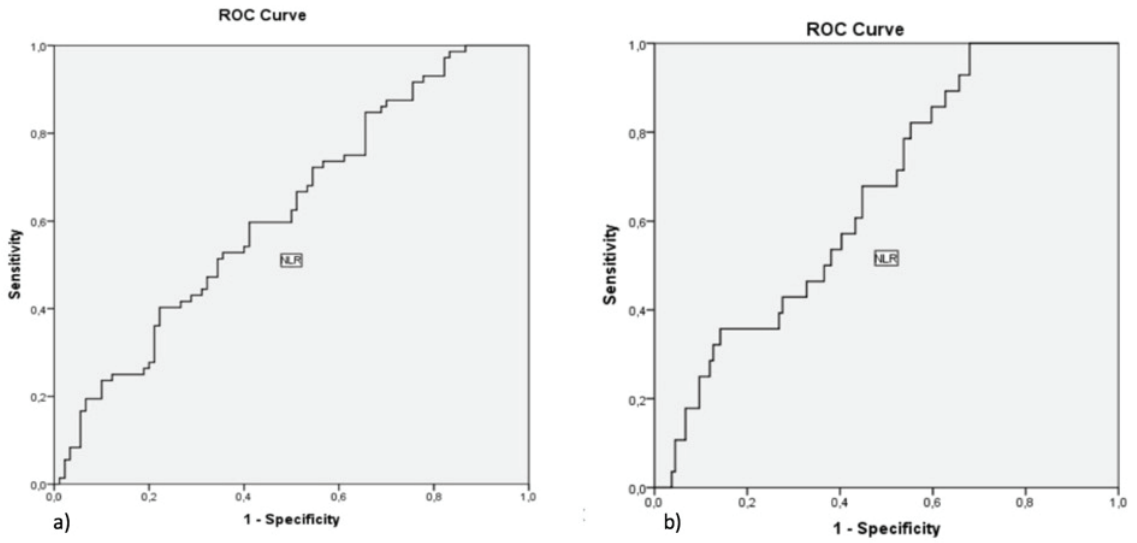
Abbreviations: NLR, neutrophil-to-lymphocyte ratio; PLR, platelet-to-lymphocyte ratio; CRP, C-reactive protein; N, number.

Figure 1. Correlations of the NLR and PLR with CRP.



Distinguishing the characteristic of NLR values according to the patient's ICU admission and mortality status was investigated through the ROC curve. NLR was found to be a significant distinctive variable ($AUC_{mortality}$=0.66 and $AUC_{ICU\ admission}$=0.62) (Figure 2).

Figure 2. ROC curves of the NLR ICU admission (a) and for predicting mortality (b).



NLR cutoff values were calculated with ROC curve. The NLR cutoff was 8 for both patients admitted to the ICU and those who died (Table 4).

Table 4. Prognostic accuracy of the NLR.

NLR	Cutoff	Sensitivity	Specificity	PPV	NPV	AUC	p
ICU admission	8	68.25	58.89	53.75	72.6	0.62	0.009
Mortality	8	67.86	54.48	23.75	89.02	0.658	0.009

Abbreviations: NLR, neutrophil-to-lymphocyte ratio; ICU, intensive care unit; PPV, positive predictive value; NPV, negative predictive value; AUC, area under the curve.

The NLR and PLR of patients hospitalized for>10 days and patients hospitalized for<10 days were compared. There was no significant difference in terms of NLR and PLR (p>0.05) (Table 5).

Table 5. Prognostic accuracy of the NLR and PLR for predicting the length of hospital stay

Hospital LOS	≤ 10 days	> 10 days	p
NLR	12.48±11.12	11.65±10.1	0.72
PLR	269.27±215.29	278.26±218.28	0.93

Abbreviations: LOS, length of stay; NLR, neutrophil-to-lymphocyte ratio; PLR, platelet-to-lymphocyte ratio.

DISCUSSION

The diagnosis of aspiration pneumonia is difficult because it can be confused with other types of pneumonia and it has a high mortality (10, 11). CRP, WBC, and neutrophil counts are still the most commonly used infection markers (12). Although procalcitonin, proadrenomedullin (proADM), urokinase-type plasminogen activator receptor (suPAR), and several cytokines have been studied as new infection markers, they are costly and have not yet been widely used (13, 14). The advantage of NLR and PLR is that they are calculated using the parameters in the whole blood count, which are currently used and are more cost-effective. NLR was first mentioned in 1985 by Varenko luS et al. (15). NLR and PLR have been used as prognostic parameters in predicting mortality in many oncological diseases as well as in cardiovascular and autoimmune diseases (15-19).

In this study, we investigated the prognostic value of NLR and PLR in aspiration pneumonia. To the best of our knowledge, this is the first study to evaluate NLR and PLR in aspiration pneumonia. Lee JH et al. have reported that NLR and PLR have prognostic importance for predicting ICU admission in patients with pneumonia (20). Yoon NB et al. have found that NLR can support tuberculosis when the cutoff value is lower than 7 in the differentiation of patients with bacterial community-acquired pneumonia and tuberculosis (21). De Jager PC et al. have found that the prognostic value for predicting hospitalization, ICU admission, and mortality was higher for of NLR than for other infection parameters in patients with pneumonia admitted to the emergency room (6). In the same study, the NLR cutoff value was determined to be 10, which was higher in patients who were hospitalized for>10 days (6).

In our study, the NLR cutoff value was 8; sensitivity and specificity for ICU admission were 68.25% and 58.89%, respectively (AUC, 0.62); sensitivity and specificity for mortality were 67.86% and 54.48%, respectively (AUC, 0.658), and the difference was significant ($p<0.05$). However, NLR did not have significant prognostic value in predicting the length of hospital stay in our study ($p>0.05$).

Yao C et al. have reported that both NLR and PLR have a prognostic role in chronic obstructive pulmonary disease acute exacerbation mortality (22). In the same study, a linear correlation was found between NLR and CRP, but no correlation was found between PLR and CRP (22).

In our study, NLR was significant in predicting mortality in aspiration pneumonia, whereas PLR had no prognostic significance in predicting both ICU admission and mortality. Similarly, a linear correlation was found between NLR and CRP, whereas no linear correlation was found between PLR and CRP. In our study, PLR was higher in patients admitted to the ICU than in those who were not admitted, but the difference was not significant ($p=0.079$). On the other hand, PLR was higher in the survival group than the mortality group. In addition, the platelet counts were significantly lower in the mortality group than the survival group.

According to Anderson R et al., this can be explained by the fact that patients with pneumonia sometimes develop thrombocytosis or thrombocytopenia (23); therefore, PLR was possibly insignificant in predicting mortality in our study.

This study had some limitations. First, this is primarily a single-center retrospective study and should be supported by prospective studies. Second, no comparison of NLR with new infection markers (such as procalcitonin and proadrenomedullin, etc.) has been made. Third, the data on the microbiological results of patients were not used in the study.

In conclusion, the prognostic value of NLR and PLR in patients with aspiration pneumonia for predicting ICU admission and mortality was investigated. NLR has a prognostic value in predicting ICU admission and mortality in patients with aspiration pneumonia, but PLR had no prognostic significance. We believe that NLR can be used, in addition to other prognostic criteria, in patients diagnosed with aspiration pneumonia with high mortality.

CONFLICTS OF INTEREST

The authors of this article state that they have no conflict of interest.

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RESEARCH

ARE INTRATYMPANIC STEROIDS OR HYPERBARIC OXYGEN THERAPY AS ADDITIONAL TREATMENTS TO SYSTEMIC STEROIDS EFFECTIVE IN ELDERLY PATIENTS WITH IDIOPATHIC SUDDEN SENSORINEURAL HEARING LOSS?

Abstract

Introduction: This study aimed to evaluate the efficacy of additional treatment modalities to systemic steroid regimen and to identify the prognostic factors in geriatric patients with idiopathic sudden sensorineural hearing loss.

Materials and Method: A retrospective review of clinical data was performed for elderly patients with idiopathic sudden sensorineural hearing loss at a tertiary hospital between 2014 and 2019. Among 60 patients, 22 received only systemic steroids (Group 1); 16 received systemic and intratympanic steroids (Group 2) and the remaining 22 received systemic steroids and hyperbaric oxygen therapy (Group 3). Recovery rates based on the Siegel's criteria and hearing level gains were compared among the groups. Gender, treatment modalities, types of audiogram and comorbidities such as hypertension and diabetes mellitus were evaluated in relation to prognosis.

Results: Pure-tone averages were significantly decreased after treatment with all three treatment modalities; however, no superiority was observed in the three treatment regimens regarding hearing gain and recovery rate. Gender, types of audiogram, hypertension and diabetes mellitus had no significant effects on hearing gain and recovery rate.

Conclusion: Intratympanic steroids or hyperbaric oxygen therapy as an adjuvant to systemic steroids provide no better results compared with only systemic steroids in elderly patients with idiopathic sudden sensorineural hearing loss.

Keywords: Aged; Hyperbaric oxygenation; Sudden hearing loss; Prognosis.

ARAŞTIRMA

İDİYOPATİK ANİ SENSÖRİNÖRAL İŞİTME KAYBI OLAN YAŞLI HASTALARDA SİSTEMİK STEROİDLERE EK OLARAK İNTRATİMPANİK STEROİDLER YA DA HİPERBARİK OKSİJEN TERAPİSİ ETKİLİ MİDİR?

Öz

Amaç: Çalışmanın amacı, idiyopatik ani sensörinöral işitme kaybı olan yaşı hastalarda sistemik steroid rejimine ek tedavi modalitelerinin etkinliğini ve prognostik faktörleri değerlendirmektir.

Gereç ve Yöntem: 2014 ve 2019 yılları arasında üçüncü basamak tedavi merkezinde idiyopatik ani sensörinöral işitme kaybı tanısı alan yaşlı hastaların bilgileri retrospektif olarak tarandı. 60 hastanın 22'si sadece sistemik steroid (Grup 1), 16'sı sistemik ve intratimpanik steroid (Grup 2) ve kalan 22 hasta da sistemik steroid ve hiperbarik oksijen (Grup 3) tedavileri aldığı gözlendi. Gruplar arasında iyileşme oranları, Siegel kriterleri ve işitme eşiği kazançlarına göre değerlendirildi. Cinsiyet, tedavi modaliteleri, odyogram tipleri, hipertansiyon ve diabetes mellitus gibi komorbid hastalıkların prognoz ile ilişkileri değerlendirildi.

Bulgular: Saf ses ortalamalarının her üç tedavi modalitesi ile anlamlı derecede azaldığı izlendi. Ancak üç tedavi modalitesinin de işitme kazançları ve iyileşme oranları açısından birbirlerine üstünlüğünün olmadığı gözlendi. Cinsiyet, odyogram tipi ve komorbid hastalıkların varlığının işitme kazancı ve iyileşme oranları üzerine etkilerinin olmadığı izlendi.

Sonuç: Sistemik steroidlerle birlikte uygulanabilen intratimpanik steroid ya da hiperbarik oksijen tedavisinin idiyopatik ani sensörinöral işitme kaybı olan yaşlı hastalarda sadece steroidlere göre daha iyi sonuçlarının olmadığı gözlendi.

Anahtar Sözcükler: Yaşlı; Hiperbarik oksijen; Ani işitme kaybı; Prognoz.

INTRODUCTION

Sudden sensorineural hearing loss is defined in the literature as a sensorineural hearing loss (SNHL) of ≥30 dB at least at three contiguous frequencies in 3 days or less (1). No identifiable cause can be detected in 84%–89% of sudden hearing loss cases, and such cases are classified as idiopathic (2). Generally, the underlying cause of idiopathic sudden sensorineural hearing loss (ISSNHL) is thought to be a viral infection or vascular disorder; however, it is obvious that there is inflammation in the inner ear (3). For this disease with many unknowns, various treatment modalities such as steroids (systemic or topical), hyperbaric oxygen therapy (HBOT), antivirals, vasoactive agents and other approaches have been tested in the literature (2). Despite the fact that several treatment protocols have been tested, there is still no consensus on the treatment of ISSNHL in the literature (2). However, the main purpose of the treatment of ISSNHL is to reduce the inflammation, increase blood flow and improve oxygenation.

Systemic steroids (SSs) have been considered as a current regimen for initial treatment of patients with ISSNHL (3). In addition to SSs, other treatment options such as intratympanic steroids (ITSs) and HBOT are being added assuming that their addition will produce a synergistic effect. ITSs and HBOT have recently become more popular in patients with ISSNHL and are used as initial or salvage treatment modalities (2, 4). Although the effects of steroids on the inner ear are not fully known, they are reportedly used because of their anti-inflammatory and anti-oedemic effects (5). Similarly, HBOT has anti-inflammatory effects and has been shown to improve tissue oxygen levels and accelerate healing (6). HBOT increases oxygen tension of perilymphatic fluids and improves the circulation (7).

Although several studies have evaluated the efficacy of steroid (systemic and/or intratympanic) and HBOT regimens, no study has investigated the efficacy of these regimens in geriatric ISSHNL patients. Therefore, in this study, we aimed to determine the additional benefits of an ITS and HBOT as adjuvant modalities in geriatric patients with ISSNHL and to compare the efficacies of a SS, combined systemic and ITSs and combined SS and HBOT. Furthermore, we aimed to evaluate the prognostic factors for ISSHNL.

MATERIALS AND METHOD

Patients aged ≥65 years and diagnosed with ISSNHL between January 2014 and January 2019 were retrospectively evaluated. The study was approved by the local ethics committee. All patients underwent pure-tone audiometric evaluation (GSI Audiostar Pro, Grason-Stadler, Minnesota, USA). Cranial and temporal magnetic resonance imaging was performed to rule out intracranial lesions, vestibular schwannoma or inner ear malformation. In the audiometry test, frequencies of 250, 500, 1000, 2000, 4000 and 8000 Hz were measured; the arithmetic mean of the thresholds at 500, 1000, 2000 and 4000 Hz was determined for the pure-tone average (PTA). Hearing loss was identified as mild (20–39 dB HL), moderate (40–54 dB HL), moderate to severe (55–69 dB HL), severe (70–89 dB HL) and profound (90 dB HL and above) according to the American Speech and Hearing Association guidelines. Audiogram types were defined as an up-sloping (>20 dB HL more severe hearing loss at 250 and 500 Hz), flat (<20 dB HL hearing loss difference at any frequency) and down-sloping (>20 dB HL more severe hearing loss at 4000 and 8000 Hz). The audiometric assessments were performed at the time of first application to the clinic (before the treatment) and 3 months after the treatment. The hearing gains for PTA and each frequency were calculated using the differences between the pre- and post-treatment thresholds. Treatment outcomes were evaluated using the Siegel's criteria. The Siegel's criteria can be categorised as follows: (1) complete recovery: final threshold of <25 dB; (2) partial recovery: gain of >15 dB, with a final hearing threshold of 25-45 dB; (3) slight recovery:

gain of >15 dB, with a final hearing threshold of >45 dB and (4) no improvement: gain of <15 dB, with a final hearing threshold of >75 dB. Prognostic factors such as gender, audiogram types, hypertension (HT) and diabetes mellitus (DM) were investigated.

Exclusion criteria were as follows: patients aged <65 years, those who received treatment 10 days after the development of hearing loss, those who had previously experienced ISSNHL, those with any surgical history that could affect the ipsilateral ear, those with any retrocochlear pathology, those with any acoustic trauma, those with any autoimmune or fluctuant hearing loss, those with any suspicious perilymph fistula and those with hearing loss with a known pathology.

A SS (oral methylprednisolone 1 mg/kg, with tapering dose every day; Prednol, Mustafa Nevzat, Istanbul, Turkey) was administered to all the patients. Only the SS was administered to Group 1. An ITS (dexamethasone 8 mg/2mL, 0.5 mL injection per session, 6 sessions for 2 weeks; Dekort, Deva, Istanbul, Turkey) and the SS were administered to Group 2. The SS and HBOT (20 sessions at 2.4 ATA and 120 min/session) were administered to Group 3. Both the additional treatment modalities were administered as an initial treatment regimen.

SPSS v.20 for Mac (IBM Corp., USA) was used for the statistical analysis. A p value <0.05 was considered to be significant. Chi-square test, independent samples t-test, paired samples t-test, Mann-Whitney U test, Wilcoxon test and Kruskal-Wallis test were used for statistical analysis.

RESULTS

In total, 60 geriatric patients with ISSNHL were included in the study. Of all the patients, 36.7% (n=22; 15 females, 7 males; mean age: 70.7±5.2 years) received only the SS (Group 1); 26.7% (n=16; 10 females, 6 males; mean age: 69.8±4.5 years) received both the SS and ITS (Group 2) and 36.7% (n=22; 13 females, 9 males; mean age: 68.5±3.9 years) received both the SS and HBOT (Group 3). There were no significant differences regarding the mean age and sex ratios among all three groups.

Before treatment initiation, 2 (3.3%) patients had mild SNHL; 8 (13.3%) patients had moderate SNHL; 23 (38.3%) patients had moderate to severe SNHL; 13 (21.7%) patients had severe SNHL and 14 (23.3%) patients had profound SNHL. On the basis of the Siegel's criteria, no improvement was seen in 33 (55%) patients; slight recovery was seen in 11 (18.3%) patients; partial recovery was observed in 13 (21.7%) patients and complete recovery was observed in 3 (5%) patients (Table 1). In all patients, pre-treatment PTA (73.1±22.4 dB HL) was significantly higher than the post-treatment PTA (56.6 ± 24 dB HL)

Table 1. Hearing recovery rates according to treatment modalities. SS, systemic steroid; ITS, intratympanic steroid; HBOT, hyperbaric oxygen therapy.

	No improvement	Slight recovery	Partial recovery	Complete recovery
Group 1 (SS; n=22)	14 (63.6%)	5 (22.7%)	3 (13.6%)	-
Group 2 (SS+ITS; n=16)	9 (56.3%)	3 (18.8%)	3 (18.8%)	1 (6.3%)
Group 3 (SS+HBOT; n=22)	10 (45.5%)	3 (13.6%)	7 (31.8%)	2 (9.1%)
All patients (n=60)	33 (55%)	11 (18.3%)	13 (21.7%)	3 (5%)

Table 2. Mean hearing levels (dB HL) before and after using treatment modalities at six frequencies and for PTA (dB HL). Group 1, administered only SS; Group 2, administered SS and ITS; Group 3, administered SS and HBOT. PTA: Pure-tone average.

	250 Hz			500 Hz			1000 Hz			2000 Hz			4000 Hz			8000 Hz			PTA		
	Pretreatment	Posttreatment	p	Pretreatment	Posttreatment	p	Pretreatment	Posttreatment	p	Pretreatment	Posttreatment	p	Pretreatment	Posttreatment	p	Pretreatment	Posttreatment	p	Pretreatment	Posttreatment	p
Group 1	63.6±24	47.3±30.3	0.001	73.9±26	56.8±28.9	0.001	75±24.6	57.3±27.6	<0.001	73.4±24.6	57.1±26.3	<0.001	80.5±22.9	68.2±21.2	0.003	85±22	78.9±24.4	0.130	75.7±23	59.9±24	<0.001
Group 2	50.6±27.1	40.3±20	0.019	57.5±29.7	45±25.2	0.001	65.6±26.2	49.7±24.4	0.002	65.9±23.8	53.8±22.9	0.003	78.1±20.2	69.1±18.6	0.002	83.1±16.5	76.3±17.5	0.002	66.8±23.7	53.7±21.1	<0.001
Group 3	58.9±25.8	46.8±25.5	0.003	65±25	46.6±30.8	0.001	76.1±22.7	54.3±30.2	<0.001	77.3±23	56.8±29	<0.001	82.3±22.2	64.6±24.5	<0.001	87.1±19	74.3±24.9	0.001	75.1±20.9	55.6±26.6	<0.001
All patients	58.4±25.6	45.3±25.9	<0.001	66.3±27	49.9±28.7	<0.001	72.9±24.4	54.2±27.5	<0.001	72.8±23.8	56.1±26.1	<0.001	80.5±21.6	67.1±21.6	<0.001	85.3±19.3	76.5±22.6	<0.001	73.1±22.4	56.6±24	<0.001

(p<0.001) (Table 2). A flat audiogram was seen in 31 (51.7%) patients; down-sloping curve was seen in 25 (41.7%) patients and up-sloping curve was seen in 4 (6.7%) patients. There was no correlation of the types of audiogram with recovery rates and hearing gains (pAudiogram–RR = 0.143, pAudiogram–HG = 0.107).

Of all the patients, 28 (46.7%) had HT and 9 (15%) had DM. A comparison of the presence and absence of these two conditions did not show a significant difference in terms of hearing gain for PTA (pHG–HT = 0.114, pHG–DM = 0.597). Furthermore, the presence of HT and DM was not correlated with recovery rates (pRR–HT = 0.330, pRR–DM = 0.080). In addition, gender was not related and correlated with hearing gain and recovery rates (p_{gender}–HG = 0.634, p_{gender}–RR = 0.524)

One (4.5%) patient with mild SNHL, two (9.1%) patients with moderate SNHL, seven (31.8%) patients with moderate to severe SNHL, seven (31.8%) patients with severe SNHL and five (22.7%) patients with profound SNHL were observed in group 1 (which received only SS). In this group, 10 (45.5%) patients exhibited a flat audiogram; 8 (36.4%) patients exhibited a down-sloping curve and four (18.2%) patients exhibited an up-sloping curve. HT was seen in nine cases (40.9%) and DM in five (22.7%) cases. Although complete recovery was not observed after SS treatment, partial recovery was observed in three (13.6%), slight recovery in five (22.7%) and no improvement in 14 (63.6%) patients. A significant decrease in PTA values was observed before and after treatment (PTA_{Pre}=75.7±23 dB HL, PTA_{Post}=59.9±24 dB HL; p<0.001). In addition, when all frequencies were examined separately, a significant decrease was observed in all the frequencies except for 8000 Hz, as shown in Table 2.

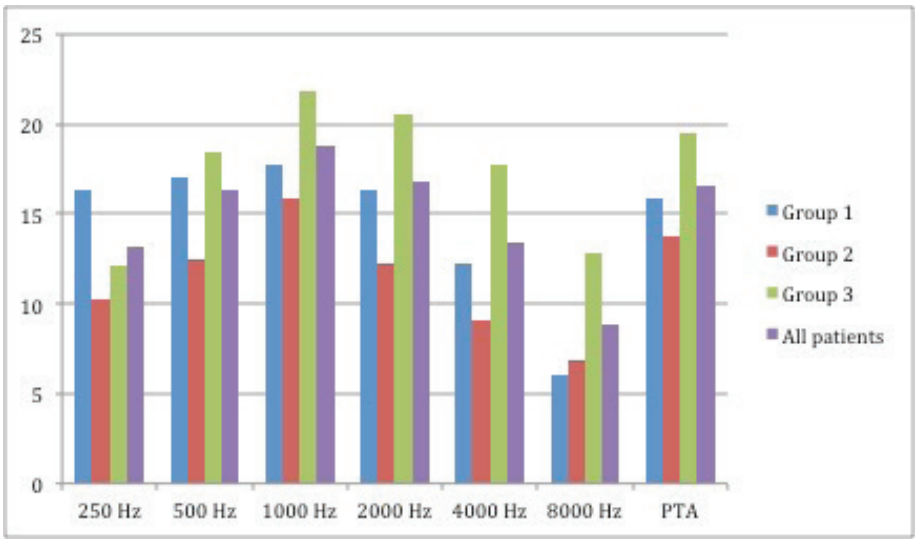
One (6.3%) patient with mild SNHL, four (25%) patients with moderate SNHL, seven (43.8%) patients with moderate to severe SNHL, one (6.3%) patient with severe SNHL and three (18.8%)

patients with profound SNHL were observed in group 2 (which received both the SS and ITS). In this group, nine (56.3%) patients exhibited a flat audiogram; seven (43.8%) exhibited a down-sloping curve and none of the patients exhibited an up-sloping curve. HT was seen in eight (50%) and DM in two (12.5%) cases. Although complete recovery was seen only in one (6.3%) patient after the SS and ITS treatment, partial recovery was observed in three (18.8%), slight recovery in three (18.8%) and no improvement in nine (56.3%) patients. A significant decrease in PTA values was observed before and after treatment (PTA_{Pre}=66.8±23.7 dB HL, PTA_{Post}=53.7±21.1 dB HL; $p<0.001$). In addition, when all frequencies were examined separately, a significant decrease was observed in all the frequencies, as shown in Table 2.

No patient with mild SNHL, two (9.1%) patients with moderate SNHL, nine (40.9%) patients with moderate to severe SNHL, five (22.7%) patients with severe SNHL and six (27.3%) patients with profound SNHL were observed in group 3 (which received the SS and HBOT). In this group, 12 (54.5 %) patients exhibited a flat audiogram; ten (45.5%) exhibited a down-sloping curve and none of the patients exhibited an up-sloping curve. HT was seen in 11 (50%) and DM in two (9.1%) cases. Although complete recovery was seen in only two (9.1%) patients after the SS and HBOT treatments, partial recovery was observed in seven (31.8%), slight recovery in three (13.6%) and no improvement in 10 (45.5%) patients. A significant decrease in PTA values was observed before and after the treatment (PTA_{Pre}=75.1±20.9 dB HL, PTA_{Post}=55.6±26.6 dB HL; $p<0.001$). In addition, when all frequencies were examined separately, a significant decrease was observed in all the frequencies, as shown in Table 2.

There was no difference between the three treatment modalities in terms of hearing gain for PTA ($GainPTA_{SS}$=15.9±18.2 dB HL, $GainPTA_{SS+ITS}$=13.8±10.6 dB HL, $GainPTA_{SS+HBOT}$=19.5±15.4 dB HL; $p_{SSvsSS+ITS}$=0.625; $p_{SSvsSS+HBOT}$=0.290; $p_{SS+ITSvsSS+HBOT}$=0.209) (Figure 1). There was no significant difference regarding hearing gain at all frequencies and with all treatment modalities. In addition, there was no relation and no correlation between recovery rates and treatment modalities (p = 0.568).

Figure 1. Hearing gain (dB HL) at each frequency and PTA gain (dB HL). Group 1, administered only SS; Group 2, administered SS and ITS; Group 3, administered SS and HBOT. PTA: Pure-tone average.



DISCUSSION

ISSNHL is a condition with uncertain aetiology and an increasing incidence with age (11/100,000 for people aged <18 years to 77/100,000 for geriatric population) (8). However, several factors including age and comorbidities such as HT and DM affect the course of ISSNHL. The hearing recovery rate in the geriatric population has been reported to be lower (odds ratio 3.25) than that in the younger population, with age being an independent prognostic risk factor for hearing recovery (9). This may be due to the ageing-related impairment of microvascular circulation. The inner ear is highly affected by microangiopathic situations that arise with ageing or other comorbidities because it is one of the important organs with high mass-specific oxygen consumption (9). This shows that the decrease in hearing recovery with age is due to the conditions such as HT, DM, dyslipidaemia and thromboembolic risk that disrupt microcirculation; the prevalence of these conditions increases with age (10). However, some studies showed that hearing recovery did not correlate with age, and some comorbid conditions were not found to be the risk factors for recovery rates (11, 12). ISSNHL studies have been generally performed in all age populations in the literature, but these studies are quite limited in the geriatric population. Considering that disease response to standard treatments becomes low with age, additional treatment modalities may provide superior outcomes. With this in mind, the goal of this study was to evaluate the correlation between possible comorbid conditions and ISSNHL and to determine the efficacy of popular treatment modalities in elderly patients with ISSNHL.

There is still no consensus on the treatment of ISSNHL, and even spontaneous resolution of ISSNHL varies between 30% and 65% (13). SSs are the generally accepted treatment regimen for ISSNHL (2). Wilson et al. showed that a SS regimen significantly ameliorated hearing loss in 61% of patients in the treatment group compared with 32% in the placebo group (14), whereas a meta-analysis revealed that treatment with SSs did not produce better results than placebo in patients with ISSNHL (15). Despite the fact that there was no placebo group in the present study, complete recovery rates were extremely low (5%). Although the effectiveness of SSs is controversial, they are most widely used in ISSNHL. SSs can be used at different doses, but generally, it is accepted to start treatment with a 1 mg/kg/day single dose of systemic prednisone or methylprednisolone and complete the treatment in 10–14 days (2). In the present study, steroid regimen was applied for all patients according to the literature. Complete recovery was not observed in any patient, and no hearing improvement was seen in 14 (63.6%) patients in group 1. A previous study reported that complete recovery was observed only in one (2.3%) patient and that 20 out of 43 (46.5%) geriatric patients with ISSNHL exhibited no changes in hearing gain, similar to the results of the present study (16). In addition, in that study, hearing recovery rates after treatment were better in geriatric patients who received a conventional SS regimen than in those who received a low-dose SS regimen. Notably, the possible adverse effects of SSs such as HT, hyperglycaemia, myocardial infarction, gastrointestinal bleeding and even death should be considered during treatment, especially in the elderly (16).

One of the steroid applications in patients with ISSNHL is intratympanic administration. It is known to have some advantages over systemic administration-less complications and increased steroid concentration in perilymph (17). ITS has been found to have a similar efficacy as only SS application in patients with ISSNHL (4). In addition, combined therapy (SS+ITS) has been found to be superior to only SS or only ITS (18). However, in the present study, the combination of SS+ITS was not found to be superior to only SS application in geriatric patients with ISSNHL. The difference between our study results and

those reported in the literature may be due to the fact that we included patients from a geriatric population with lower recovery rates.

HBOT has been used in the treatment of systemic or local vascular diseases for more than half a century. HBOT is an option for patients with ISSNHL, and it mainly acts by increasing oxygen pressure of blood and the inner ear (7). In a Cochrane review, HBOT was found to improve the mean PTA by 25% in patients with ISSNHL (19). Co-administration of HBOT and SS may have a synergistic effect on hearing recovery in ISSNHL patients. A combination of SS+HBOT reportedly provided better results than only SS administration for hearing gain in patients with ISSNHL > 61 dB HL (20). In addition, a combination of SS+HBOT showed a better effect than ITS+HBOT in patients with profound ISSNHL (21). However, we did not find any difference in terms of recovery rates and hearing gains among SS+HBOT, SS+ITS or only SS modalities. The discrepancy with the results reported in the literature may be due to the fact that the patients in the literature were selected from all ages because a combination of SS+HBOT was found to be significantly less effective for hearing gain in elderly ISSNHL patients (20). In addition, HBOT is generally preferred as a salvage treatment option for SS-failed ISSNHL cases due to its unclear benefit and high costs (22).

In the literature, complete recovery was observed in 5.9% (2/34), partial recovery in 8.8% (3/34), slight improvement in 29.4% (10/34) and no hearing improvement in 55.9% (19/34) of patients aged >60 years according to the Siegel's criteria (23). In the present study, no improvement was seen in 33 (55%), slight improvement in 11 (18.3%), partial recovery 13 (21.7%) and complete recovery in 3 (5%) of 60 patients. When both studies were compared, it was noteworthy that although some treatment modalities were different, the recovery rates were similar. The impact of the type of audiogram on the results is not well known. It is stated that the type of audiogram might be a prognostic factor for hearing recovery rates, with up-sloping audiogram curve related to a better prognosis and down-sloping curve related to a worse prognosis (24). However, in the literature, the type of audiogram reportedly had no effect on recovery rates (23). Similarly, in the present study, there was no correlation between audiogram types and hearing gain and recovery rates in elderly patients with ISSNHL. Comorbidities such as HT and DM were evaluated as prognostic factors for recovery rates; this issue is controversial in the literature (11, 25). In the present study, these two comorbidities were not found to be correlated with recovery rates and hearing gains. In the literature, delayed treatment has been reported to be related to poor recovery rates, especially if treatment was started 10 days after onset (23). In order to eliminate the delayed treatment effect, patients who were treated after 10 days were excluded from the study. Limitations of the present study were its retrospective nature and the absence of a placebo group.

In conclusion, the present study showed that ITS or HBOT as additional initial therapies to SS have no effect on recovery rates and hearing gain in elderly patients with ISSNHL. However, ITS or HBOT should be considered as a treatment regimen for salvage treatment or in cases where SS cannot be used.

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CONFLICT OF INTEREST

The authors declare that no conflict of interest regarding the publication of this manuscript.

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RESEARCH

CHARACTERISTICS OF OPEN-GLOBE INJURIES IN ELDERLY PATIENTS

Abstract

Introduction: This study evaluated the clinical characteristics, outcomes, and prognostic factors of open-globe injuries (OGI) in geriatric patients.

Materials and Method: Hospital records of patients diagnosed with OGI between 2014 and 2018 were retrospectively analyzed. They were divided into two groups: ≥65 years (geriatric) and 20–64 years (adult). Age, gender, nature of trauma, Initial visual acuity (VA), clinical signs, surgical procedures, final VA, and additional complications were reviewed and compared between groups. Correlation analyses were performed using the Spearman/Pearson correlation and the Student's t-test. A multiple linear regression model was used to identify independent predicting factors for final VA.

Results: There were 34 patients each in the geriatric (23 males, 11 females) and the adult (30 males, 4 females) groups with mean ages of 70.5±8.5 and 38.8±10.9 years, respectively ($p<0.001$). The most frequent OGI was globe rupture (25 patients, 73.5%) in the geriatric group and penetrating trauma (23 patients, 67.6%) in the adult group ($p=0.001$). The most frequent cause of trauma was falls (29.4%) in the geriatric group and metal objects (32.3%) in the adult group. Initial VA in the geriatric and adult groups was 0.037±0.10 and 0.29±0.31, respectively ($p<0.001$). The mean ocular trauma score (OTS) in the geriatric and adult groups was 50.3±14.5 and 64.7±16.7, respectively ($p=0.001$). Final VA in the geriatric and adult groups was 0.16±0.24 and 0.55±0.36, respectively ($p<0.001$). Both groups exhibited a correlation among initial VA and final VA ($p1=0.005$, $r1=0.487$; $p2<0.001$, $r2=0.730$). The primary parameters influencing OGI prognosis in the geriatric group were age, initial VA, OTS, and trauma type.

Conclusion: OGI differs between geriatric and adult groups based on demographic, clinical, and prognostic characteristics of the trauma. İncreased age, low initial VA and OTS, and presence of globe rupture were identified as potential risk factors for poor final VA.

Key words: Geriatrics; Eye injuries; Prognostic factors.

ARAŞTIRMA

YAŞLI HASTALARDA AÇIK GLOB YARALANMALARININ ÖZELLİKLERİ

Öz

Giriş: Açık glob yaralanması (AGY) olan geriatrik hasta grubunda klinik özeliklerin, sonuçların ve prognozu etkileyen faktörlerin değerlendirilmesi amaçlandı.

Gereç ve Yöntem: 2014-2018 yılları arasında AGY nedeniyle takip edilen 65 yaş ve üstü (geriatrik grup) ve 20-64 yaş aralığındaki (erişkin grup) hastaların dosyaları geriye dönük olarak incelendi. Hastaların yaş, cinsiyet, travma nedeni, tipi, zonu, başlangıç görme keskinliği, klinik bulguları, cerrahi prosedürleri, son görme keskinliği ve ek bulguları incelendi ve gruplar arasında karşılaştırıldı. Korelasyon analizi için Spearman/Pearson korelasyon ve Student T testi; sonuç görme keskinliğini etkileyen risk faktörlerini belirlemek için çoklu lineer regresyon modeli kullanıldı.

Bulgular: Geriatrik grupta yer alan 23'ü erkek, 11'i kadın 34 hastanın yaş ortalaması 70.5±8.5 iken; erişkin grupta yer alan 30'u erkek, 4'ü kadın 34 hastanın yaş ortalaması 38.8±10.9 idi ($p<0.001$). Geriatrik grupta glob rüptürü (25 hasta, %73.5) daha sıkken; erişkin grupta penetran travma (23 hasta, %67.6) daha sıktı ($p=0.001$). En sık görülen travma nedeni geriatrik grupta düşme (%29.4) iken, erişkin grupta metal objelerdi (%32.3). Geriatrik ve erişkin grupta başlangıç görme keskinliği sırasıyla 0.037±0.10 ve 0.29±0.31 iken ($p<0.001$); ortalama okuler travma skoru (OTS) değeri ise sırasıyla 50.3±14.5 ve 64.7±16.7 idi ($p=0.001$). Sonuç görme keskinliği geriatrik ve erişkin grupta sırasıyla 0.16±0.24 ve 0.55±0.36 olup; geriatrik grupta belirgin olarak daha düşüktü ($p<0.001$). Her iki gruptada başlangıç görme keskinliği ile son görme keskinliği arasında belirgin bir korelasyon mevcuttu ($p1=0.005$, $r1=0.487$; $p2<0.001$, $r2=0.730$). Geriatrik hastalarda prognozu etkileyen faktörler yaş, başlangıç görme keskinliği ve OTS değeri ve travma tipi idi.

Sonuç: Geriatrik hasta grubundaki AGY bazı demografik, klinik ve prognostik özellikleriyle erişkin hastalara göre belirgin farklılıklar göstermektedir. İleri yaş, düşük başlangıç görme keskinliği ve OTS değeri, glob rüptürü varlığı geriatrik grupta düşük sonuç görme keskinliği için risk faktörleridir.

Anahtar Sözcükler: Geriatri; Göz travması; Prognostik faktörler.

INTRODUCTION

Open-globe injuries (OGI) are a critical, albeit preventable, cause of ocular morbidity that typically occur after blunt or penetrating trauma. It is a worldwide public health concern with a global incidence rate of 3.5/100,000 persons per year (1). Low socioeconomic status, male gender, workplace, and road accidents are reported to be the risk factors for OGI (2).

The peak ages of OGI occurrence ranges from 30 to 50 years (3). It frequently occurs in males, and most of them are work-related (4). Nonetheless, a high percentage (20.6%) of OGI occurs in the pediatric age group (3). Therefore, most studies focus on the pediatric and adult patient groups.

Notably, the annual incidence of ocular trauma among the elderly (aged >65 years) is 38/100,000, with 7% of them being OGI (5–7). The characteristics and prognosis of the OGI in the elderly differ from those of the OGI in the younger individuals (6,8). Few studies have detailed regarding the clinical characteristics, outcomes, and prognostic factors of OGI in the elderly.

The present study aimed to evaluate the epidemiological and clinical characteristics and analyze the outcomes and prognostic factors of OGI in elderly patients.

MATERIALS AND METHOD

Medical records of patients with a diagnosis of OGI between 2014 and 2018 at the Sakarya University Medical Education and Research Hospital were retrospectively reviewed. Patient records were obtained from hospital computer database by using International Statistical Classification of Diseases and Related Health Problems (ICD) code for open-globe repair. The patients were divided into two groups: ≥65 years (geriatric group) and 20–64 years (adult group). The study was performed in accordance with the Declaration of Helsinki and was approved by the Institutional Review Board (29.08.2019-E.10869).

The medical records of patients were reviewed and the following data were collected: demographics (age and sex); nature of trauma (cause, type, and zone); Initial examination findings such as visual acuity (VA) measured using Snellen chart, clinical signs, presence of hyphema, lens injury, uveal tissue prolapse, vitreous loss, vitreous hemorrhage, retinal detachment, intraocular foreign body, and relative afferent pupillary defect; surgical procedures (primary/additional); and follow-up examination findings (final VA and ocular complications).

OGI was classified into four categories: rupture, penetrating injury, perforating injury, or intraocular foreign body based on the Birmingham Eye Trauma Terminology (9). The location of the injury was defined as the zone of the injury and classified according to the Ocular Trauma Classification System guidelines (9). Zone I includes injuries to cornea and corneoscleral limbus; zone II includes injuries that are located in the corneoscleral limbus at a point 5 mm posterior to the sclera; and zone III includes injuries that are located in the sclera at a point more than 5 mm to the corneoscleral limbus.

Ocular Trauma Score (OTS), the raw score determined based on the evaluation of rupture, endophthalmitis, perforating injury, retinal detachment, afferent pupillary defect, and Initial VA, was calculated for each patient (10). Based on the severity of the trauma, OTS ranges between 0 and 100. The scores are stratified into five categories, which predict the final VA.

Statistical Package for the Social Sciences (SPSS Inc., Chicago, IL, USA), version 23.0 software, was used for statistical analysis. Analytical methods (Kolmogorov–Smirnov test) were used to determine whether the variables were normally distributed. Descriptive analyses were presented using mean and standard deviations for normally distributed variables. Correlation analyses (between OTS and the final VA and the Initial and

final VA) were performed using the Spearman/Pearson correlation and the Student's t-test. A multiple linear regression model was used to identify independent predicting factors for final VA. p values of <0.05 were considered statistically significant.

RESULTS

This study comprised 34 patients (23 males and 11 females) in the geriatric group and 34 patients (30 males and 4 females) in the adult group with mean ages of 70.5±8.5 (65–91) and 38.8±10.9 (20–64) years, respectively, (p<0.001). OGI occurred in 18 right eyes and 16 left eyes in the geriatric group, and 22 right eyes and 12 left eyes in the adult group with no significant intergroup difference (p=0.324).

Nonetheless, significant differences were observed based on gender and trauma type between groups. The male to female ratio was 7.5:1 in the adult group and 2.1:1 in the geriatric group. The adult group had a significantly higher number of males than geriatric group (p=0.041). The geriatric group was noted to have a male preponderance; however, it was not statistically significant. Regarding the trauma type, the most common type of OGI was globe rupture in the geriatric group (25 patients, 73.5%) and penetrating trauma in the adult group (23 patients, 67.6%) (p=0.001). The most frequent cause of trauma in the geriatric group was falls (29.4%), closely followed by wooden objects (26.4%). In the adult group, the most common cause of trauma was metal objects (32.3%), followed by sharp objects (17.6%) and wooden objects (17.6%) (Table 1).

Table 1. General characteristics of patients.

Variable	Geriatric n	%	Adult n	%	p
Age (years)	70.5±8.5		38.8±10.9		0.001
Gender					
Male	23	67.6	30	88.2	0.041
Female	11	32.3	4	11.7	
Laterality					
Right	18	52.9	22	64.7	0.324
Left	16	47.1	12	35.2	
Trauma type					
Rupture	25	73.5	11	32.3	0.001
Penetrating	9	26.4	23	67.6	
Cause of trauma					
Sharp objects	2	5.8	6	17.6	
Stone	2	5.8	1	2.9	
Metal	3	8.8	11	32.3	
Wood	9	26.4	6	17.6	
Glass	3	8.8	3	8.8	
Traffic accident	2	5.8	3	8.8	
Falls	10	29.4	2	5.8	
Other	3	8.8	2	5.8	

Zones I (13 patients, 38.2%) and II (13 patients, 38.2%) were the most common sites of trauma in the geriatric group, whereas zone I (17 patients, 50%) was the most common in the adult group. No statistical significance was observed regarding the zone of trauma (p=0.279).

Upon examination of clinical signs, hyphema was observed in 22 patients (64.7%) in the geriatric group and 8 patients (23.5%) in the adult group, and it was significantly higher in the geriatric group (p=0.001). The presence of lens injury (38.2%), iris prolapse (61.7%), vitreous loss (32.3%), and vitreous hemorrhage (47%) were more common in the geriatric group than that in the adult group; however, the difference was not statistically significant. Moreover, both groups were similar regarding the presence of retinal detachment and foreign body (Table 2). Subconjunctival lens dislocation after blunt trauma was seen in 4 patients in the geriatric group.

Initial VA was 0.037±0.10 and 0.29±0.31 in the geriatric and adult groups, respectively (p<0.001). Notably, 41.1% of the elderly patients and 14.7% of the adult patients had light perception or worse VA preoperatively. The mean OTS was 50.3±14.5 and 64.7±16.7 in the geriatric and adult groups, respectively, being significantly worse in the geriatric group (p=0.001). Mean OTS category was 1.9±0.7 and 2.6±0.8 in the geriatric and adult groups, respectively (p=0.003).

Both groups had a similar frequency of primary and multiple surgeries (p=0.564). Notably, 11 (32.3%) patients in the geriatric group and 13 (38.2%) patients in the adult group underwent additional surgical procedures. Among the

Table 2. Initial parameters of OGI in patients.

Variable	Geriatric n	%	Adult n	%	p
Zone of trauma					
Zone I	13	38.2	17	50	0.279
Zone II	13	38.2	7	20.5	
Zone III	8	23.5	10	29.4	
OTS category					
1	10	29.4	3	8.8	0.003
2	16	47.1	13	38.2	
3	7	20.5	12	35.2	
4	1	2.9	6	17.6	
Involved clinical signs					
Hyphema	22	64.7	8	23.5	0.001
Lens injury	13	38.2	10	29.4	0.442
Iris prolapse	21	61.7	14	41.1	0.089
Vitreous loss	11	32.3	9	26.4	0.595
Vitrous hemorrhage	16	47.1	9	26.4	0.078
Retinal detachment	3	8.8	3	8.8	0.532
Foreign body	3	8.8	7	20.5	0.171
Subconjunctival lens dislocation	4	11.7		0	
Surgery					0.564
Primary	25	73.5	22	64.7	
Multiple	11	32.3	13	38.2	

geriatric group patients, 5 had vitreoretinal surgery, 3 had phacoemulsification and intraocular lens implantation, 2 had anterior chamber lavage, and 1 had evisceration. Among the adult group patients, 7 had phacoemulsification and intraocular lens implantation and 6 had vitreoretinal surgery. Secondary glaucoma controlled with antiglaucoma drugs was observed in 8 (23.5%) and 3 (8.8%) patients in the geriatric and adult groups, respectively. No patient in either group had post-traumatic endophthalmitis.

Final VA was 0.16±0.24 and 0.55±0.36 in the geriatric and adult groups, respectively, being significantly worse in the geriatric group ($p<0.001$). Both groups revealed a correlation between initial and final VA ($p1=0.005$, $r1=0.487$; $p2<0.001$, $r2=0.730$, Pearson's test). Poor initial VA resulted in poor final VA. Moreover, both groups showed a similar correlation between OTS and final VA ($p1=0.001$, $r1=0.543$; $p2<0.001$, $r2=0.713$, Pearson's test).

Linear regression analysis was performed to determine the factors affecting the final VA, which was divided into 2 categories: ≤20/200 and >20/200. Age; trauma type; initial VA; OTS; and the presence of hyphema, lens injury, iris prolapse, vitreous loss, vitreous hemorrhage, retinal detachment, and foreign body were determined as potential factors affecting final VA. Notably, age (Odds ratio: 0.832), type of the trauma (Odds ratio: 0.188), initial visual acuity (Odds ratio: 1.962), and OTS (Odds ratio: 1.107) were determined to be the potential risk factors for poor final VA (Table 3).

DISCUSSION

The present study showed that some clinical characteristics and outcomes and the epidemiology of OGI differ between elderly and adult individuals. In this study, the male to female ratio was 2.1:1 in the geriatric group and 7.5:1 in the adult group. The geriatric group exhibited a male preponderance; however, it was not statistically significant. The predominance of

Table 1. Regression analysis on preoperative parameters affecting final VA in geriatric patients.

Variable	Odds ratio	p	95% CI for Cv	
Age	0.832	0.048	0.693	0.999
Trauma type	0.188	0.023	0.044	0.794
Initial VA	1.962	0.043	0.384	2.285
OTS	1.107	0.009	1.025	1.195
Lens injury	0.380	0.428	0.035	4.152
Hyphema	4.854	0.316	0.221	16.693
Iris prolapse	0.355	0.447	0.025	5.116
Vitreous loss	9.352	0.256	0.198	42.536
Vitreous hemorrhage	3.377	0.504	0.095	19.599
Retinal detachment	12.659	0.949	1.414	23.222

VA: Visual acuity, OTS: Ocular trauma score

males observed in the adult group was consistent with previously published data. Primary reasons for this male preponderance in the adult group are higher risk from work-related and dangerous outdoor activities (2, 3). Previous studies have reported that the gap between genders decreases with increasing age owing to lifestyle changes (6, 11). Some studies have reported a high incidence of OGI in elderly women because of the high risk of falls (6, 7). By contrast, our study showed a male predominance probably because of increased daily activities of older men.

The most common OGI type was globe rupture in the geriatric group (73.5%) and penetrating trauma in the adult group (67.6%) in the present study. Similarly, Andreoli et al. (6) (88%), Sheng et al. (12) (83.3%), and Tok et al. (8) (56.7%) reported that ruptured globe was the most common type of OGI in the geriatric population. They suggested that previous ophthalmic surgeries weaken the globe, which can be a precipitating factor for ruptures after blunt trauma. Sheng et al. (12), Andreoli et al. (6), and Tok et al. (8) reported that 51.1%, 49%, and 16.6% patients, respectively, had previous ocular surgeries and dehiscence of the surgical wound. In all these studies, the most common previous surgery was cataract surgery. In our study, only 3 (8.8%) patients had cataract surgery previously, and subconjunctival intraocular lens dislocation was observed in 2 of 3 patients after blunt trauma in the geriatric group. Furthermore, our results showed a correlation between the type of injury and final VA. Globe rupture was associated with poor final VA, which is consistent with previous studies (13, 14). This result could be owing to globe rupture causing significant damage to ocular tissues through the coup–contrecoup mechanism.

It was reported that, wound localization tends to be more posterior, and zones II and III traumas were more common in the geriatric group after globe rupture (6, 8). By contrast, trauma zones showed a relatively uniform distribution in our geriatric group. Sheng et al. (12) reported that the distribution of trauma related to zones was partially equal in the elderly, which is consistent with our results.

In our study, the most frequent causes of OGI in elderly were falls (29.4%), followed by wooden (26.4%), glass (8.8%), and metal objects (8.8%). In contrast, metal (32.3%), sharp (17.6%), and wooden (17.6%) objects were more likely to cause OGI in adults. Andreoli et al. (6) (65%), Sheng et al. (12) (64.4%), Desai et al. (15) (44%), Sahraravand et al. (7) (22%), and Tok et al. (8) (13.4%) reported that falls are the most common cause of eye injuries in elderly patients, which is consistent with our results. The varying rates of results in these studies may be related to the differences in the lifestyle of the elderly based on their sociocultural differences. Onakpoya et al. (11) reported that OGI in elderly typically occurs during farming activities in developing countries, whereas it happens at home owing to falls in developed countries. Increasing age, cognitive and visual impairment, poor depth perception, balance disorders, and systemic diseases increase the risk of fall-related eye injuries in the elderly (7,11,16). Notably, even a mild trauma owing to fall can cause globe rupture in elderly individuals because of the decreased globe rigidity and may lead to significant ocular damage.

In our study, hyphema (64.7%), iris prolapse (61.7%), vitreous hemorrhage (47%), lens injury (38.2%), and vitreous loss (32.3%) were more common in the geriatric group than in the adult group. However, the difference was significant only for hyphema. Sheng et al. (12) reported that rates of iris prolapse, hyphema, and vitreous hemorrhage were 70%, 66.7%, and 51.1%, respectively, which is concordant with our results. Agrawal et al. (13) reported that lens injury, hyphema, vitreous loss, and vitreous hemorrhage were significant predictive parameters affecting the final VA. In our study, none of these parameters were found to be potential risk factors for poor final VA.

Initial VA was worse in the geriatric group, and

41.1% of these patients had light perception or worse initial VA preoperatively. Consistent with our results, previous studies showed that initial VA was significantly worse in the geriatric group (6, 8, 12). Our study found a correlation between initial and final VAs in both groups, and initial VA was a crucial prognostic factor-consistent with previously published data (13, 14, 17). Poor initial VA indicates more severe ocular tissue damage, particularly in the retina and optic nerve. Accordingly, the final VA was significantly worse in the geriatric group of our study ($p<0.001$). Moreover, poor final VA may be related to the limited recovery process and accompanying ocular diseases, such as age-related macular degeneration, glaucoma, and vascular occlusive diseases in elderly patients.

Most studies have found OTS to be an important predictive factor in OGI (9, 15, 18). In our study, the mean raw OTS was 50.3 and 64.7 in the geriatric and adult groups, respectively. Furthermore, it correlated with final VA in both groups. Andreoli et al. (6) reported that the mean OTS was 47 and 70 for the geriatric and young groups, respectively. Lower OTS indicates more severe ocular injury, which may be accompanied by a retinal detachment, optic nerve injury, and endophthalmitis.

Both groups had a similar frequency of primary and multiple surgeries. Most frequent additional surgeries were vitreoretinal surgery in the geriatric group and phacoemulsification and intraocular lens implantation in the adult group. Only 1 patient had evisceration in the geriatric group. The literature revealed a low evisceration rate in the elderly because of their low aesthetic expectations, increased risk of additional surgery owing to comorbidities, and decreased risk of sympathetic ophthalmia owing to reduced life span (6, 8).

Several studies have been designed to determine the factors affecting the final VA after OGI. Age; type and zone of the OGI; extent of the wound; initial VA; and the presence of hyphema, vitreous loss, vitreous hemorrhage, retinal detachment, and lens injury were found to be the parameters that significantly correlated with the final VA (15–20). In this study, the primary parameters influencing the final VA and prognosis of the OGI in the geriatric group were age, initial visual acuity, OTS, and trauma type.

Nevertheless, the limitations of our study were its retrospective nature, a small sample size, and short follow-up time.

Open-globe injury is a significant cause of visual impairment in the elderly. Results of this retrospective study showed that OGI in the geriatric group differs from that in the adult group in terms of some demographic and clinical characteristics of the trauma. Notably, globe rupture was the primary trauma type, and falls were the most frequent cause. Furthermore, increased age, poor initial VA, low OTS, and presence of globe rupture were the primary risk factors for poor final VA in the geriatric group.

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CONFLICT OF INTEREST

There is no conflict of interest.

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RESEARCH

PROGNOSTIC FACTORS AND SURVIVAL OF ELDERLY WOMEN WITH BREAST CANCER AGED ≥70 YEARS

Abstract

Introduction: In the treatment of geriatric patients with breast cancer, each patient should be treated according to his/her specific disease, performance status, and biological age. In this study, we aimed to investigate prognostic factors affecting survival in women aged ≥70 years of age and older with breast cancer.

Materials and Method: A total of 148 female patients aged ≥70 years who were admitted to the University of Health Sciences Istanbul Training and Research Hospital Radiation Oncology clinic between 2011 and 2017 were evaluated.

Results: Age (p<0.001), tumor diameter (p<0.001), operability (p<0.001), tumor stage (p<0.001), lenfovascular invasion (p=0.045), estrogene receptor positivity (p=0.002), progesterone receptor positivity (p=0.046), metastasis (p<0.001), Ki 67 ≥ 14 ratio (p=0.035), Charlson comorbidity index (p=0.005), and radiotherapy applicability (p=0.023) were significantly associated with overall survival. Multivariate cox regression analysis revealed that age (HR=1.126, 95% CI=1.048–1.210, p<0.001), estrogene receptor positivity (HR=3.701, 95% CI=1.286–0.652, p=0.015), and presence of metastasis (HR=0.210, 95% CI=0.051-0.863, p=0.030) were independent prognostic factors.

Conclusion: According to our clinical experiences, the treatment approach for healthy elderly women with recently diagnosed breast cancer is similar to that for young women, i.e., surgery, axillary evaluation, radiotherapy, and systemic adjuvant therapy (depending on tumor properties and recurrence risk). In elderly breast cancer patients, ER positivity, absence of distant metastasis, and age younger than < 79 years old have been identified as independent prognostic factors that positively affect survival.

Keywords: Breast cancer; Survival; Prognosis; Aged.

ARAŞTIRMA

YETMİŞ YAŞ VE ÜZERİ MEME KANSERLİ YAŞLI KADINLARDA PROGNOSTİK FAKTÖRLER VE SAĞKALIM

Öz

Giriş: Meme kanseri olan geriatrik hastaların tedavisinde, her hasta kendi hastalığına, performans durumuna ve biyolojik yaşına göre tedavi edilmelidir. Bu çalışmada, meme kanserli, ≥70 yaş ve üstü yaşlı kadınlarda sağkalımı etkileyen prognostik faktörleri araştırmayı amaçladık.

Gereç ve Yöntem: 2011-2017 yılları arasında Sağlık Bilimleri Üniversitesi İstanbul Eğitim ve Araştırma Hastanesi Radyasyon Onkolojisi kliniğine başvuran, yaşları ≥70 ve üstünde olan toplam 148 kadın hasta değerlendirildi.

Bulgular: Yaş (p<0.001), tümör çapı (p<0.001), ameliyat edilebilme (p<0.001), tümör evresi (p<0.001), lenfovasküler invazyon varlığı (p=0.045), östrojen reseptörü pozitifliği (p=0.002), progesteron reseptör pozitifliği (p=0.046), metastaz varlığı (p<0.001), Ki 67 ≥ 14 oranı (p=0.035), Charlson komorbidite indeksi (p=0.005) ve radyoterapi uygulanabilirliği (p=0.023) genel sağkalım ile anlamlı olarak ilişkiliydi. Çok değişkenli cox regresyon analizi yaş (HR=1.126, 95% CI=1.048–1.210, p<0.001), östrojen reseptör pozitifliği (HR=3.701, 95% CI=1.286–0.652, p=0.015) ve metastaz varlığının (HR=0.210, 95% CI=0.051-0.863, p=0.030) bağımsız prognostik faktörler olduğunu gösterdi.

Sonuç: Klinik deneyimlerimize göre, yeni teşhis edilmiş meme kanseri olan sağlıklı yaşlı kadınlar için tedavi yaklaşımı; cerrahi, aksiller değerlendirme, radyoterapi ve sistemik adjuvan tedavi (tümör özelliklerine ve nüks riskine bağlı olarak) yani genç kadınlardakine benzerdir. Yaşlı meme kanseri hastalarında ER pozitifliği, uzak metastaz olmaması ve yaşın 79'dan daha genç olması sağkalımı olumlu etkileyen, bağımsız prognostik faktörler olarak tespit edilmiştir.

Anahtar Sözcükler: Meme kanseri; Sağkalım; Prognoz; Yaşlı.

INTRODUCTION

The incidence of breast cancer, the most common malignancy in women, is increasing with age (1). Approximately three-fourth of patients diagnosed with breast cancer comprises postmenopausal women. One out of eight women (12.5%) undergoes breast cancer at least once in the entire life. Cancer treatment in elderly patients is essentially difficult in clinical oncology. Performance, life expectancy and accompanying diseases in elderly patients with breast cancer are the factors that can be used to effectively determine treatment. Despite the significant representations of populations with breast cancer, elderly women with breast cancer are widely excluded from the standard medical treatment or are probably suggested with less effective treatment options (1,2). It is important to take into account the chronological age, potential risks against absolute benefits, treatment tolerance, patient preference, possible side effects of treatment and life expectancy in the treatment of older patients with breast cancer (3). Therefore, we aimed to describe our treatment practices in elderly women with breast cancer.

MATERIALS AND METHOD

Between 2011 and 2017, 148 female patients aged ≥70 years who were admitted to the Radiation Oncology Clinic of the Istanbul Training and Research Hospital were evaluated. The last follow-up was conducted in December 2017. The period from disease-free survival (DFS) until metastasis or local recurrence was observed; overall survival (OS) was assessed as the time until death. Exclusion criteria were as follows: patients who were previously diagnosed with other types of cancer, patients who were diagnosed with ductal carcinoma in situ (DCIS), male sex, and patients aged <69 years. In accordance with the Declaration of Helsinki, this retrospective study was approved by the ethics committee of our hospital (2019/1889).

Statistical analyses

Using descriptive data analysis, the average, standard deviation, median, lowest, highest, frequency, and ratio were obtained. The Kolmogorov Smirnov test was used to measure variable distributions. The Mann–Whitney U test was used for quantitative analysis of independent data, which were then assessed using the chi-square test. The Fisher's test was used when the chi-square test conditions were not provided. Survival analysis was performed using log-rank test for univariate analysis and Cox model for multivariate analysis. The SPSS 22.0 program was used in all analyses. A p value of <0.05 was considered statistically significant.

RESULTS

All the patients enrolled in this study primarily complained of a mass in the breast. The most common histologic type was invasive ductal carcinoma 111 (75%) patients, followed by mucinous carcinoma 13 (8%), invasive lobular carcinoma 8 (6%), mixed type 5 (4%), invasive micropapillary carcinoma 4 (3%), apocrine carcinoma 3 (2%), metaplastic carcinoma 2 (1%), and neuoroendocrine carcinoma 2 (1%) (p=0.715). In both the groups, the most common location of metastasis was bone 7 (44%) patients, followed by the lung 5 (31%), liver 2 (13%), and brain 2 (13%). Baseline characteristics of patients and analysis results are shown in Table 1.

When the groups were divided according to ages, i.e., 70–79 and >80 years, Charlson Comorbidity index (CCI) and radiotherapy (RT) were found to be statistically significant. Median follow-up was 30±24.33 months (95% CI 31.0–40.0) in 70-79 years group and 25.5±19.72 months (95% CI 22.4–36.1) in >80 years patients (p=0.231). There was no statistically significant difference in regard to osteoporosis or osteopenia in patients with bone mineral density measured (p=0.407) (Table 2).

Table 1. Baseline characteristics of patient groups and difference analysis results.

Variable	Exitus (n=31/%)	Alive (n=117/%)	p
Age (mean±sd)	78.00±6.42	73.00±4.13	<0.001
Tumour diameter Mean±sd	3.00±1.70	2.00±1.39	<0.001
Histology			
IDC	21 (68)	90 (77)	
ILC	1 (2)	7 (6)	0.301
Others	9 (30)	29 (17)	
Operation			
Mastectomy	20 (65)	48 (41)	
BCS	5 (16)	61 (52)	<0.001
Biopsy	6 (19)	8 (7)	
Histological grade			
1	1 (3)	15 (13)	
2	17 (55)	75 (64)	0.059
3	13 (42)	27 (23)	
Nuclear grade			
1	2 (6)	17 (15)	
2	16 (52)	74 (63)	0.067
3	13 (42)	26 (22)	
LVI			
Present	17 (55)	41 (35)	0.045
Absent	14 (45)	76 (65)	
PNI			
Present	9 (29)	18 (15)	0.080
Absent	22 (71)	99 (85)	
Receptor status			
ER (+)	18 (58)	98 (84)	0.002
ER (-)	13 (42)	19 (16)	
PgR (+)	24 (77)	106 (91)	0.046
PgR (-)	7 (23)	11 (9)	
Cerb-B2 (+)	7 (23)	15 (13)	0.174
Cerb-B2 (-)	24 (77)	102 (87)	
Radiotherapy			
Yes	21 (68)	100 (85)	0.023
No	10 (32)	17 (15)	

Variable	Exitus (n=31/%)	Alive (n=117/%)	p
Chemotherapy			
Yes	13 (42)	62 (53)	0.274
No	18 (58)	55 (47)	
Ki67 ratio			
0-14	19 (61)	47 (40)	0.035
>14	12 (39)	70 (60)	
Stages			
1	3 (10)	31 (27)	
2	11 (35)	61 (52)	<0.001
3	11 (35)	22 (19)	
4	6 (20)	3 (2)	
Metastases			
Present	11 (35)	5 (4)	<0.001
Absent	20 (65)	112 (96)	
Additional illness			
Present	22 (71)	82 (70)	0.924
Absent	9 (29)	35 (30)	

sd: standart deviation, IDC: Invasive ductal carcinoma, ILC: Invasive lobular carcinoma, BCS: Breast conserving surgery, LVI: Lenfovascular invasion, PNI: Perineural invasion, ER: Estrogen receptor, PgR: Progesterone receptor

Table 2. Group analysis according to age.

Variable	Age 70–79 years(n/%)	Age >80 years(n/%)	p
Charlson Comorbidity Index			0.002
1–2 points	94 (83)	18 (53)	
3–4 points	15 (13)	12 (35)	
>5 points	5 (4)	4 (12)	
BMD			0.407
Osteopenia	23 (31)	5 (22)	
Osteoporosis	52 (69)	18 (78)	
Radiotherapy schema			0.011
Absent	17 (15)	10 (29)	
50 Gy	31 (27)	15 (44)	
60 Gy	40 (35)	5 (15)	
Hypofraction	23 (20)	2 (6)	
Palliative	3 (3)	2 (6)	

BMD: Bone mineral density

Table 3. Results of univariate cox regression analysis.

Univariate analysis	95% CI	HR	p
Age	1.076–1.206	1.139	<0.001
Tumor diameter	1.242–1.875	1.526	<0.001
LVI	1.116–4.624	2.272	0.024
ER	0.137–0.577	0.281	0.001
PgR	0.139–0.771	0.328	0.011
Radiotherapy	0.266–1.214	0.569	0.145
Stage	1.649–3.657	2.456	<0.001
Operation	1.602–4.685	2.739	<0.001
Metastases	2.711–1.944	5.690	<0.001
Ki 67 ratio	0.385–1.697	0.808	0.573
CCI	0.592–1.234	0.854	0.402

LVI: Lenfovascular invasion, ER: Estrogene receptor, PgR: Progesterone receptor, CCI:Charlson comorbidity index.

Table 4. Results of multivariate cox regression analysis.

Multivariate analysis	95% CI	HR	p
Age	1.048–1.210	1.126	0.001
Tumor diameter	0.827–1.470	1.103	0.506
LVI	0.268–1.424	0.617	0.258
ER	1.286–0.652	3.701	0.015
PgR	0.189–2.508	0.688	0.571
Stage	0.415–2.579	1.034	0.943
Operation	0.077–2.312	0.422	0.320
Metastases	0.051–0.863	0.210	0.030
Metastases	2.711–1.944	5.690	<0.001
Ki 67 ratio	0.385–1.697	0.808	0.573
CCI	0.592–1.234	0.854	0.402

LVI: Lenfovascular invasion, ER: Estrogene receptor, PgR: Progesterone receptor

The univariate analysis revealed that age, tumor diameter, LVI, ER positivity, PgR, tumor stage, operation, and metastasis were statistically significant (Table 3).

The multivariate analysis revealed that ER positivity, age, and presence of metastasis were independent prognostic factors (Table 4).

DISCUSSION

Increasing age is the main risk factor for breast cancer. The incidence of breast cancer increases in elderly women up to the age of 80 years but reaches a plateau at the age of 80–85 years (4). In our clinic, 10% of all patients with breast cancer are aged ≥70 years. Elderly women do not meet the criteria for inclusion in clinical trials owing to the existence of comorbidities. Therefore, no evidence-based guidelines are available for the treatment of this group of patients (3, 5).

The most common breast cancer occurring in elderly patients is invasive ductal cancer (76%). Moreover, invasive lobular carcinoma accounts for 5.6% of elderly breast pathologies (6). The most common breast cancer in our study is similar to that reported in the literature, i.e., invasive ductal carcinoma (75%) and invasive lobular carcinoma (6%). Age does not affect the histological characteristics of breast cancer. Lobular, mucinous, and papillary carcinomas are also more common in elderly women (7). A study reported that mucinous carcinomas were observed in 4%–6% of patients with breast cancer aged >75 years (7). In our study, this carcinoma was observed in a relatively high proportion of patients (8%).

Surgery assumes a serious role for the treatment of breast cancer. Advanced age may be a primary factor of death in elderly patients with breast cancer. It also increases morbidity and mortality rates associated with surgery (8). Mastectomy was the classic treatment option for elderly patients in the past years. Currently, breast-conserving surgery (BCS) is in the foreground for the treatment of breast cancer (8). In the present study, modified radical mastectomy was performed in patients aged ≥80 years and BCS in those aged <79 years.

Difficulties in providing optimal treatment include treatment effects on the patient's quality of life, reduced life expectancy, reduced intellectual and physical performances, patient preference, and slow disease progression. Elderly women may delay reporting the suspect symptoms and lesions to their physicians. Such symptoms are commonly detected at advanced stages of breast cancer (9). In the present study, tumor diameter was also found to be larger in patients with advanced age.

The prognosis of breast cancer in elderly women considerably varies depending on many factors. The existence of comorbidity frequently involved a decrease in life expectancy and played a vital role in shaping the survival in elderly patients (10, 11). Some studies show that comorbidities are not associated with increased treatment toxicity or disease recurrence in elderly women with good performance status undergoing adjuvant chemotherapy (12). No significant difference was observed regarding the presence of additional comorbidities in our patients. The Charlson comorbidity index (13) revealed statistical significance when our patients were categorized as older, and octogenarians. The multivariate analysis showed that this was not a prognostic factor. Therefore, when creating a geriatric-specific treatment plan, comorbidities, survival, and treatment tolerance should be considered.

Surgical choices for axillary involvement in elderly women are similar to those for young women (14). The risk of local recurrence is low in elderly women, and the advantage of RT may decrease with age after undergoing BCS (15). Therefore, some elderly women may not require adjuvant RT, particularly those aged >70 years with negative nodal disease (clinically or pathologically confirmed) and estrogen receptor-positive breast cancer, tumor diameter <2 cm; therefore, adjuvant endocrine treatment is often

recommended. Excluding RT does not afflict OS but is associated with high breast recurrence (16). For patients aged ≥80 years with lymph node-positive and HR-negative breast cancer, breast RT is recommended because most local recurrences are likely to occur several years after diagnosis. For patients with large lesions and lymph node involvement, regional radiation increases survival, and the benefits of survival are observed 5–10 years after the diagnosis. Life expectancy is not useful for those with recurrence in <5 years (17, 18). RT lymph node-positive and HR-negative elderly patients were included in our study, and no local recurrence was observed in the patients. In elderly patients, hypofractionated RT is preferred. In elderly patients, the efficacy of postmastectomy irradiation has been evaluated; however, no randomized controlled trial has been conducted for the same. In a retrospective analysis, postmastectomy irradiation was associated with improved survival in elderly women with a risk of breast cancer (T3/4 and/or N2/3) (19). Irradiation (postmastectomy and/or breast + boost) was found to be statistically significant for survival in our patients too, and RT toxicities analogous to those observed in younger patients were monitored.

The most common type of breast cancer occurring in elderly patients is higher-grade, hormone receptor-positive invasive ductal cancer (20). In the univariate analyses, ER and PR statuses were statistically significant. However, in the multivariate analyses, only the ER status was identified as an independent prognostic factor.

Tamoxifen is only suitable for women who are at risk of heart complications, osteoporosis, and/or osteopenia, or who cannot tolerate aromatase inhibitors (20). Although the optimum period of using hormonal therapy remains unclear, the treatment has been suggested to be administered for 5 years in elderly women similar to that in young women. However, in selected patients, especially those with high-risk capable tumors, more extended periods of up to 10 years may be appropriate (21). In our patients, aromatase inhibitors were the first choice for hormonal therapy. No significant difference was observed between the two groups in terms of osteopenia or osteoporosis for patients whose bone mineral density was measured.

Our study revealed that the independent prognostic factors were advanced age, ER positivity, and presence of metastasis.

According to our expertise, currently, treatment for elderly patients with breast cancer may be similar to that for young patients. The treatment plan consists of breast and axillary surgeries, systemic chemotherapy, adjuvant RT, and hormonal therapy if patient performance is excellent. If the patient's life expectancy is constrained due to comorbidities, follow-up with hormonal therapy can be advised. In patients with HER-2-positive breast cancer, trastuzumab can be used without systemic chemotherapy. Further clinical studies are required in elderly patients for validating the findings of this study. Moreover, cooperation between oncologists and geriatrists is required.

Due to advanced age, long-term follow-up is not possible. Considering the human life has prolonged, we recommend that elderly patients should be included in clinical trials/studies to establish additional appropriate treatment choices.

CONFLICT OF INTEREST

The authors declare no conflicts of interest associated with this study

Abbreviations:

OS: Overall survival, DFS: Disease-free survival, CCI: Charlson comorbidity index, RT: Radiotherapy, LVI: Lenfovascular invasion, PNI: Perineural invasion, ER: Estrogen receptor, PgR: Progesterone receptor, BCS:Breast conserving surgery

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RESEARCH

RELATIONSHIP BETWEEN MORTALITY AND THE LABORATORY VALUES AT ADMISSION TO PALLIATIVE CARE UNIT IN GERIATRIC PATIENTS WITH NO DIAGNOSIS OF MALIGNANCY

Abstract

Introduction: With a global rise in the elderly population, the need for palliative care units (PCU) is also increasing. Moreover, it is important to determine the prognosis in these patients. Thus, the present study aimed to evaluate the relationship between mortality and the biomarkers at admission to PCU, in the geriatric patients with no diagnosis of malignancy.

Materials and Method: Medical records of the patients hospitalised in the Isparta City Hospital PCU, between 01.03.2017 and 31.03.2018, were retrospectively reviewed. Age, gender, neutrophil, lymphocyte and platelet counts, mean platelet volume and the C-reactive protein and albumin values, at admission to the PCU, were evaluated.

Results: The median age of the patients was 81 years (interquartile range: 73–87 years), and 58.5% (n=76) of the patients were female. The mortality rate of the patients was 21.5% (n=28). An albumin value<3.5 g/dL (odds ratio 35.40, 95% confidence interval (CI)=4.86-257.65 and p<0.001) was determined as an independent risk factor. The cut-off for the mean albumin value according to the receiver operating characteristic analysis, performed to predict the mortality rate, was 3.5 g/dL, with sensitivity and specificity values as 89% and 92%, respectively. The positive and negative predictive values and the positive and negative likelihood ratio values were 0.75, 0.96, 11.38 and 0.12, respectively (area under the curve=0.937 and 95% CI=0.880–0.994, p<0.0001).

Conclusion: Albumin values may effectively predict the prognosis of geriatric PCU patients, not diagnosed with malignancy.

Key words: Palliative Care; Geriatrics; Mortality; Serum Albumin.

ARAŞTIRMA

MALİGNİTE TANISI OLMAYAN GERİATRİK HASTALARIN PALYATİF BAKIM ÜNİTESİNE YATIŞ LABORATUAR DEĞERLERİ İLE MORTALİTENİN İLİŞKİSİ

Öz

Giriş: Yaşlı popülasyonda küresel bir artışla birlikte, palyatif bakım üniteleri (PBÜ) ihtiyacı da artmaktadır. Ayrıca, bu hastalarda prognozun belirlenmesi önemlidir. Bu nedenle, bu çalışmada malignite tanısı olmayan geriatrik hastalarda PBÜ'ye giriş sırasındaki biyobelirteçler ile mortalite arasındaki ilişkinin değerlendirilmesi amaçlanmıştır.

Gereç ve Yöntem: 01.03.2017 ve 31.03.2018 tarihleri arasında Isparta Şehir Hastanesi PBÜ'de yatan hastaların tıbbi kayıtları retrospektif olarak incelendi. Üniteye giriş sırasındaki yaş, cinsiyet, nötrofil, lenfosit ve trombosit sayısı, ortalama trombosit hacmi ve C-reaktif protein ve albümin değerleri değerlendirildi.

Bulgular: Hastaların ortanca yaşı 81 (çeyrekler arası aralık: 73-87) idi ve hastaların % 58.5'i (n=76) kadındı. Hastaların mortalite oranı % 21.5 (n=28) idi. <3.5 g/dL'lik bir albümin değeri (Odds oranı=35.40, %95 güven aralığı (CI)=4.86–257.65 ve p<0.001) bağımsız bir risk faktörü olarak belirlenmiştir. Mortalite oranını tahmin etmek için yapılan ROC çözümleme analizine göre albümin cut-off değeri, sırasıyla% 89 ve% 92 olarak duyarlılık ve özgüllük değerleri ile 3,5 g / dL idi. Pozitif ve negatif prediktif değerler ve pozitif ve negatif olabilirlik oranı değerleri sırasıyla 0.75, 0.96, 11.38 ve 0.12 idi (eğri altındaki alan=0.937 ve% 95 CI=0.880-0.994, p<0.0001).

Sonuç: Albumin değerleri, malignite tanısı almayan geriatrik PBÜ hastalarının prognozunu etkili bir şekilde öngörebilir.

Anahtar sözcükler: Palyatif bakım; Geriatri; Mortalite; Serum Albumin

INTRODUCTION

The elderly population is rising globally. In the United States, the population over 65 years of age was 9% in the year 1960, while it is expected to reach 20% by 2050 (1). Likewise, the elderly population is increasing in our country. In the last census in our country, the population of the elderly was found to be 8.3% (2). Life expectancy in Turkey is 75.3 years for men and 80.7 years for women (3). With the increase in life expectancy, the burden of chronic diseases in patients over 65 years of age also increases (4). Chronic diseases increase with the ageing population. As a result, the need for palliative care units (PCUs) is increasing (5). According to the data of Turkish Public Hospitals Authority (October 2016), Turkey has a total of 2,220 beds in 197 PCUs, the number being much lower than the required (6).

PCUs are intended to improve the quality of life of people with chronic illnesses, by preventing and relieving symptoms (7). In Turkey, palliative care, intensive care, geriatric care and home care services are nested case. In this way, it is aimed to provide the necessary care to patients in every environment.

A better definition of the profile of patients in PCUs and the factors affecting the duration of stay will contribute to the efficient use of existing palliative care beds. For this reason, it is essential to determine the clinical characteristics of the patients in PCU and examine the factors associated with the prognosis. Studies investigating the factors, affecting the duration and prognosis of palliative care patients, are limited (8).

The aim of this study was to evaluate the relationship between mortality and the biomarkers at admission to PCU, in geriatric patients with no diagnosis of malignancy. When selecting the biomarkers evaluated, it is intended to be used in relatively new markers such as C-reactive protein/Albumin Ratio as well as classical markers such as neutrophil, lymphocyte, platelet count, neutrophil to lymphocyte ratio, C-reactive protein and albumin.

MATERIALS AND METHOD

In this study, medical records of the patients hospitalised in the Isparta City Hospital PCU, between 01.03.2017 and 31.03.2018, were retrospectively reviewed, after obtaining the approval of the local ethics committee (Ethical Committee approval date & number: 27.06.2018 & 2018/250). Patients with a diagnosis of malignancy, lack of medical records and under the age of 65 years were excluded from the study. Furthermore, patients with recurrent admissions were not included in the study. Patients with hemodynamic instability and infection were also excluded. The following variables during the admission to the PCU were recorded: age, gender, accompanying illnesses, neutrophil, lymphocyte and platelet counts, mean platelet volume (MPV) and the C-reactive protein (CRP) and albumin values. Neutrophil/lymphocyte ratio (NLR), platelet/lymphocyte ratio (PLR) and CRP/albumin ratio were calculated from these values. Furthermore, the length of stay and survival were also recorded. Survival data were collected over three months, after the end of the study and the survival was determined from the date of initial admission at the PCU.

Data were statistically analysed using the SPSS Version 22.0 (Statistical Package for the Social Sciences Inc., Chicago, IL, USA). Data were tested for normality with Kolmogorov–Smirnov (with Lilliefors correction) and Shapiro–Wilk tests. Descriptive statistics were performed in both the patient groups; numerical data were expressed as median [the interquartile range (IQR)], while categorical data as percentages. Patients were classified according to the PCU outcomes (dead or survived), as survivor and the non-survivor groups. Patient features were compared using the Chi-Square or Fisher's Exact test for categorical

variables and Mann–Whitney U-test for numerical variables. A p value< 0.05 was accepted as statistically significant. To identify any independent risk factor associated with mortality, among the significant parameters of univariate analysis, the ones which were not associated with each other were subjected to multivariate linear regression analysis. Receiver operating characteristic (ROC) analysis was performed.

RESULTS

Two hundred and twenty-one patients were admitted to the PCU during the study period, and 130 of them met the criteria for inclusion and analysis of data. The general characteristics of the patients included in the study are presented in Table 1. The median age of the patients was 81 years (IQR: 73–87 years), and 58.5% (n=76) of the patients were female. The median length of stay was 14 days (7–42 days). The mortality rate of the patients was 21.5% (n=28).

The patient characteristics in terms of mortality are shown in Table 2. In the survivor group, the neutrophil count (p=0.009), MPV (p=0.004), CRP (p=0.015) and CRP/albumin ratio (p<0.001) were lower, whereas albumin was higher (p<0.001), than the non-survivor group.

Table 1. General Characteristics of Patients.

Variable	Total Patients (n= 130) Median (IQR), n (%)
Age, year	81.00 (73.00-87.00)
Gender, (M/F) n (%)	54 (41.5) / 76 (58.5)
Accompanying Illnesses, n (%) Diabetes Hypertension Neurological Diseases Organ Failure Nutritional Disorder	 20 (15.4) 38 (29.2) 74 (56.9) 18 (13.8) 85 (65.4)
Length of Stay, day	14.00 (7.00-42.00)
Neutrophil count, (109 /L)	5.79 (4.41-8.27)
Lymphocyte count, (109 /L)	1.34 (1.02-1.78)
Platelet count, (109 /L)	261000 (210000-355000)
Mean Platelet Volume, fl	8.4 (7.90-9.00)
Neutrophil to lymphocyte ratio	4.71 (2.81-7.63)
Platelet to lymphocyte ratio	197.57 (147.36-279.14)
C-reactive protein, mg/L	3.67 (1.71-8.46)
Albumin, g/dL	3.50 (3.47-3.82)
C-reactive protein/Albumin Ratio	1.09 (0.46-2.59)

IQR: Inter Quantile Range, M: Male, F: Female.

The parameters with significant results according to univariate analysis were evaluated with multivariate analysis. Among these parameters, only albumin< 3.5 g/dL [odds ratio (OR) 35.40, 95% confidence interval (CI)=4.86–257.65, p<0.001] was determined as an independent risk factor. Albumin< 3.5 [OR 157.2, 95% CI=4.3–5709.8, p=0.006] was determined as an independent risk factor (Table 2).

The ROC analysis for the prediction of mortality and cut-off values in the survivor group versus non-survivor group was performed. The mean albumin values based on ROC analysis are shown in Table 3. The cut-off value of mean albumin values according to the ROC analysis was found as 3.5 g/dL (Figure 1). The sensitivity and specificity values for the albumin cut-off value of 3.5 g/dL were 89% and 92%, respectively.

Table 2. The patient characteristics in terms of mortality.

	Univariate analysis			**Multivariate analysis**	
	Mortality		**P**	**OR**	**P**
	Survivor (n= 102) Median (IQR), n (%)	**Non-Survivor (n= 28) Median (IQR), n (%)**			
Age, year	80.50 (72.00-87.00)	83.00 (76.25-86.25)	0.505		
Gender, (M/F) n (%)	42 (41.2) / 60 (58.8)	12 (42.9) / 16 (57.1)	0.873		
Accompanying Illnesses, n					
Diabetes	19 (18.6)	1 (3.57)	0.038		NS
Hypertension	33 (32.35)	5 (17.85)	0.101		
Neurological Diseases	60 (58.82)	14 (50.00)	0.267		
Organ Failure	13 (12.74)	5 (17.85)	0.337		
Nutritional Disorder	63 (61.76)	22 (78.57)	0.074		
Length of Stay, day	14.50 (7.00-52.25)	12.00 (4.25-34.00)	0.145		
Neutrophil count, mm^3 [a]	5.58 (4.14-7.93)	6.80 (5.47-9.55)	0.009		NS
Lymphocyte count, mm^3	1.38 (1.03-1.85)	1.15 (0.97-1.38)	0.060		
Platelet count, mm^3	259000 (210750-355000)	274500 (209250-357000)	0.937		
Mean Platelet Volume, fl [a]	8.40 (7.90-8.90)	8.65 (8.10-9.37)	0.004		NS
Neutrophil to lymphocyte ratio	3.84 (2.58-7.46)	6.32 (4.75-8.01)	0.161		
Platelet to lymphocyte ratio	187.16 (137.86-267.77)	253.81 (167.31-317.84)	0.090		
C-reactive protein, mg/L [a]	3.27 (1.59-7.36)	7.17 (2.80-9.22)	0.015		NS
Albumin, g/dL	3.60 (3.50-3.92)	2.32 (2.12-3.01)	<0.001	35.40 (4.86-257.65)	<0.001
C-reactive protein/Albumin Ratio [a]	0.89 (0.39-2.08)	2.32 (0.94-4.01)	<0.001		NS

The parameters in bold indicates the significant ones in univariate and multivariate analysis. a Marked parameters which were significant in univariate analysis and not associated with each other were included in the multivariate analysis. IQR: Inter Quantile Range, OR: Odds Ratio, M: Male, F: Female.

Figure 1. Receiver Operating Characteristic (ROC) curve for mean Albumin Value.

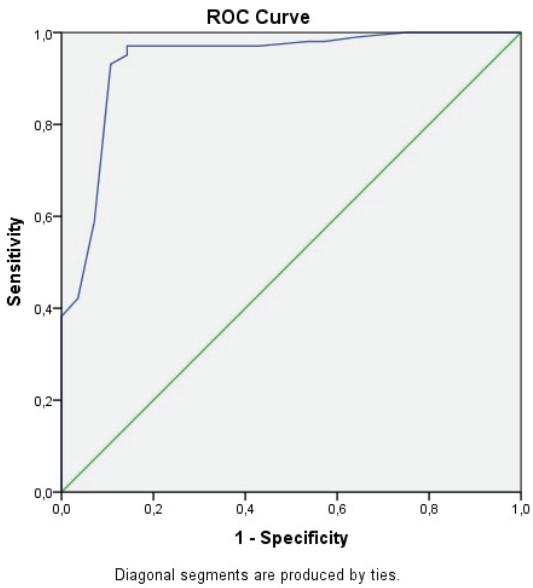

Table 3. Receiver operating characteristic analysis for the prediction of mortality. Cut-off for Survivor group versus Non-Survivor group mean Albumin based on ROC analysis.

	AUC	p value	Asymptotic 95 % confidence intervals lower bound -upper bound	Cut off value
Mean Albumin	0.937	<0.0001	0.880-0.994	<3.5
		Outcome: Death		
		Yes	No	Total
Mean Albumin< 3.5	Yes	25	8	33
	No	3	94	97
	Total	28	102	130
			95 % confidence intervals	
Sensitivity	0.89		0.72-0.97	
Specificity	0.92		0.85-0.96	
Predictive value of positive test	0.75		0.61-0.86	
Predictive value of negative test	0.96		0.91-0.98	
Positive likelihood ratio	11.38		5.78-22.41	
Negative likelihood ratio	0.12		0.04-0.35	

ROC: Receiver operating characteristic; AUC: Area Under The Curve.

Positive predictive value, negative predictive value, positive likelihood ratio and negative likelihood ratio values were found as 0.75, 0.96, 11.38 and 0.12, respectively (the area under the curve (AUC) was 0.937 and 95% CI=0.880–0.994, p<0.0001) (Table 3).

DISCUSSION

The concept of PCU is the newly defined in Turkey and the PCU capacity is not enough yet. Due to the growing elderly population throughout the world, the need for PCUs is increasing. Therefore, effective use of PCU is important. PCU-related studies are limited in the literature and are mostly related to the duration of stay and the factors affecting cost (8). Moreover, the PCU-related studies are more related to patients with malignancy, who constitute the majority of the PCU patients. In the literature, there are limited studies on the factors that affect the prognosis in PCUs and in the patients with no malignancy admitted to the PCUs.

In the present study, the relationship between mortality and the laboratory values at admission to PCU was evaluated in geriatric patients with no diagnosis of malignancy. In the present study, it was shown that only the albumin levels influenced the mortality rate. The literature assessing the factors affecting the prognosis of patients in PCUs is limited. In addition, the inclusion of patients with malignancy in these studies further complicates the situation. Many laboratory values have been evaluated for the evaluation of prognosis in various patient groups, especially in the intensive care units (ICUs). However, the studies evaluating the effect of these parameters on the prognosis in PCUs are not enough.

Albumin is an acute phase protein, synthesised by the liver and has several basic functions. It is the primary serum binding protein responsible for the transport of various substances, has anti-thrombotic effect and is responsible for maintaining normal plasma colloid oncotic pressure (9). Normally, albumin has a long half-life (15–19 days), but rapid declines are seen in critically ill patients (9). Albumin is primarily a binding protein. This is particularly important in the elderly, because the concentration of circulating free drugs increases in hypoalbuminemia and an increased bioavailability may cause adverse effects (10). Hypoalbuminemia has previously been associated with short-term mortality, hospital stay, and complications (9, 11). A large prospective study of emergency patients showed that patients with hypoalbuminemia had a shorter-term mortality, three times higher than the patients with normal albumin (9). Jellinge et al. found hypoalbuminemia to be associated with 30-day all-cause mortality in acutely admitted medical patients (12). In patients with normal albumin levels at admission, a 2% mortality was determined (13). Mortality was determined as 12% in patients with mild hypoalbuminemia and 34% in patients with marked hypoalbuminemia. This rate was found to be 0.3% in patients with hyperalbuminemia (13). In addition, there was a significant increase in long-term and short-term survival in patients who had hypoalbuminemia at the time of admission, but normalised albumin levels during the stay in the hospital (13).

The prognostic role of albumin in patients with severe comorbidity has increased. However, its value as a marker of mortality in PCU patients is still unclear. The effect of albumin and creatinine levels at the time of admission on survival was evaluated in PCU patients and albumin values lower than 3.1 g/dL were shown to be associated with poor survival (14). In the present study, it was shown that the only parameter with prognostic importance in geriatric patients in the PCU, without a diagnosed malignancy, was albumin. Albumin values lower than 3.5 g/dL were shown to be associated with poor survival.

CRP is a classical acute phase protein that shows a rapid and significant increase in plasma concentration in response to acute inflammation (15). The CRP level has been reported to be a

good prognostic marker in patients with advanced stage cancer (15).

Anamo et al. have demonstrated the relationship between CRP levels with symptoms and activities of daily living in advanced stage cancer patients receiving palliative care and that CRP levels may be a good biomarker in these patients (16). In the present study, although CRP values were 2 times higher in the non-survivor group, it was shown that they had no effect on mortality.

Recently, the CRP/albumin ratio, a combination of markers for systemic inflammation and nutritional status, has been extensively studied as an independent prognostic marker in patients with infection, malignancy and other diseases (17). However, there is no study focusing on patients in the PCUs. The increased CRP/albumin ratio in the ICUs is an independent risk factor for mortality (18). In addition, the CRP/albumin ratio among patients receiving parenteral nutrition is closely related to morbidity and mortality (19). Since the CRP/albumin ratio effectively reflects both inflammation and malnutrition, it can be a useful biochemical marker to predict prognosis among the critically ill patients. In a retrospective study evaluating the clinical benefit of CRP/albumin ratio in predicting 30-day mortality in critically ill patients, an elevated CRP/albumin ratio was an independent risk factor for the 30-day mortality, and the predictive value of CRP/albumin ratio was lower than that of the albumin alone, APACHE (Acute Physiology and Chronic Health Evaluation) II score and Charlson Comorbidity Index (20).

In the study performed by Park et al., high CRP/albumin ratio was shown to be associated with increased mortality in the ICU patients (21). However, the sensitivity and specificity of the CRP/albumin ratio were not enough high for mortality estimation. In the present study, although the CRP/albumin ratio was higher in the non-survivor group, it was found to have no effect on mortality.

The NLR which can be easily obtained by automated blood count devices has been evaluated for the clinical effects of many types of cancer (22). It was stated that, elevated NLR was an independent prognostic factor for poor survival in patients with terminal cancer (23).

In the studies performed in ICU patients, the effect of NLR on prognosis could not be demonstrated (24). In addition, these studies showed that the neutrophil and platelet counts, MPV and CRP did not have any significance in terms of prognosis in the ICU patients, similar to the results of the present study.

Apart from all these laboratory values, accompanying illnesses of the patients have an effect on mortality. Although there is not enough literature about this subject in PCU patients, there is a wide literature about ICU patients. Already, the basis of many scoring systems routinely used in ICUs is based on organ failure and accompanying illnesses. One of the most important scoring systems, Sequental Organ Failure Assessment (SOFA) score, was used to clearly define the relationship between organ failure and mortality in ICU patients (25,26). The highest SOFA score in the first and first few days of entry to ICU was reported to be strong prognostic indicators (27). Although there is not enough information about the effects of organ failure on the mortality and morbidity of PCU patients, the effect of a serious medical condition such as organ failure on mortality should be considered as a natural outcome. However, our study revealed that organ failure in PCU patients is not an independent risk factor for mortality. We believe that the inclusion of patients without a diagnosis of malignancy was the reason for this result.

It has been shown that the duration of ICU stay and mortality are increased in patients with nutritional disorders (28). As a natural consequence of this condition, changes in laboratory values such as albumin are expected in patients with nutritional disorders. In the present study, although the rate of nutritional disorders was high in the Non-Survivor

group, no statistically significant difference was found. However, we think that significant decrease in albumin in Non-Survivor group is a clinical indicator of this condition.

In a study in which the clinical features of the PCU patients were evaluated for the duration of hospital stay and prognosis, it was stated that the advanced pressure wound was the most important factor to prolong hospital stay (29). In addition, it was shown that the use of opioid and malignancy were the most important factors for prognosis. Unlike the present study, malignancy patients were also included in that study and laboratory values were not studied.

This study had some limitations, the first being its retrospective nature and the other being a single-centred work. And also, it can be seen as a limitation that no scoring system was used during PCU admission.

Thus, to predict the prognosis of geriatric PCU patients, without a diagnosis of malignancy, the albumin values at admission to PCU may be effective.

CONFLICT OF INTEREST

All authors state that there is no conflict of interest.

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RESEARCH

THE EFFECT OF WALKING EXERCISE ON QUALITY OF LIFE AND SLEEP IN ELDERLY INDIVIDUALS: RANDOMIZED CONTROLLED STUDY

Abstract

Introduction: This study was conducted for determining the effect of a walking exercise program on quality of life and sleep in elderly individuals.

Materials and Method: The study was designed as a randomized controlled trial that was stratified by gender, age, and physical activity levels. The study was conducted with 60 elderly individuals, 30 participants in the exercise walking group who participated in the walking program, and 30 participants in the control group without any intervention. The exercise walking group participated in the 40-minute walking program twice a week for 8 weeks. No intervention was made for the control group. In the study, data were collected using the introductory information form, World Health Organization Quality of Life Scale-Elderly Module, and Pittsburgh Sleep Quality Index. The same data collection forms were re-administered to the both groups after the walking program.

Results: A significant improvement was found in the daily walking time (mean±sd=32.16±13.43), quality of life (mean±sd=81.30±2.87) and sleep quality (mean±sd=4.33±2.39), of the exercise walking group participating in the walking program compared with the control group ($p<0.001$).

Conclusion: It was found that the walking program positively affected quality of life and sleep of elderly individuals. Consequently, this walking program is recommended to be applied in every environment where elderly individuals live.

Keywords: Aged; Walking; Quality of Life; Sleep.

ARAŞTIRMA

YAŞLILARA UYGULANAN YÜRÜYÜŞ PROGRAMININ YAŞAM KALİTESİ VE UYKU ÜZERİNE ETKİSİ: RANDOMİZE KONTROLLÜ ÇALIŞMA

Öz

Giriş: Bu çalışma yürüyüş programının yaşlıların yaşam kalitesi ve uykusuna etkisini belirlemek amacıyla yapılmıştır.

Gereç ve Yöntem: Çalışma, cinsiyet, yaş ve fiziksel aktivite düzeylerine göre tabakalandırılmış randomize kontrollü bir araştırmadır. Çalışma yürüyüş programına katılan 30 deney grubu ve her hangi bir girişim uygulanmayan 30 kontrol grubu olmak üzere 60 yaşlının katılımı ile gerçekleşmiştir. Deney grubu sekiz hafta boyunca haftada iki kez, günde 40 dakikalık yürüyüş programına alınmıştır. Kontrol grubuna herhangi bir girişimde bulunulmamıştır. Çalışmada veriler her iki grupta, tanıtıcı bilgi formu, Dünya Sağlık Örgütü Yaşam Kalitesi Ölçeği-Yaşlı Modülü ve Pittsburgh Uyku Kalitesi İndeksi kullanılarak toplanmıştır. Yürüyüş programından sonra her iki gruba aynı veri toplama formları tekrar uygulanmıştır.

Bulgular: Yürüyüş programına katılan deney grubunun günlük yürüyüş süresi (ortalama±ss=32.16±13.43), yaşam kalitesi (ortalama±ss=81.30±2.87) ve uyku kalitesinde (ortalama±ss=4.33±2.39) kontrol grubuna göre önemli derecede ilerleme belirlenmiştir ($p<0.001$).

Sonuç: Yürüyüş programının yaşlı bireylerin yaşam ve uyku kalitesini olumlu etkilediği bulunmuştur. Sonuçta yürüyüş programının yaşlının yaşadığı her ortamda yapılabileceği önerisinde bulunulmuştur.

Anahtar Sözcükler: Yaşlı; Yürüme; Yaşam Kalitesi; Uyku.

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INTRODUCTION

Increased life span and the decreased birth rates are aging the world's population. The World Health Organization (WHO) states that the elderly population is gradually increasing. By 2040, the proportion of the population aged 65 years and over in the entire population is expected to increase from 6.9% to 12% (1).

Turkey is one of the rapidly aging countries. The proportion of the elderly population (aged ≥65 years) in Turkey has risen from 7.7% in 2013 to 8.3% in 2016. This ratio is expected to increase to 10.2% in 2023, to 20.8% in 2050, and to 27.7% in 2075. On the basis of these figures, Turkey is estimated to be one of the "very old" countries in 2023 (2).

This rapid increase in the elderly population brings about physical, spiritual, social, economic and environmental problems. In addition, increasing age affects the quality of life of elderly individuals. Quality of life is a complex and broad concept influenced by the individual's physical and psychosocial health, culture and beliefs, and its relationship with the environment. It can, therefore, not be directly observed but can be measured through the factors affecting it. Studies have shown that age, gender, marital status, educational status, work life, income level, level of social support, relationship with family and environment, culture, health status, characteristics of housing, spare time activities, exercise habits, and sleep pattern are important variables affecting the quality of life of elderly individuals (3-5). Reportedly, different dimensions of quality of life are associated with sleep duration and sleep quality (4). In addition, studies have shown that elderly people living in nursing homes experience more sleep problems and have lower quality of life than elderly people living with their families (4, 5).

In recent studies, interventions such as Yoga, Pilates, Tai Chi, music, laughing therapy, humor, prayer, meditation, exercise therapy and training, Swiss ball and elastic band exercise, running, and walking activity have been shown to be appropriate interventions used for improving the quality of life and sleep quality in elderly individuals (7, 8).

Walking is an important activity as it is risk-free, easy and costless, can be performed without the need of special sports centers, is easily tolerated by every individual, is a type of exercise in daily life, and can be performed by elderly individuals on their own. Walking is also defined as a changeable behavioral factor associated with quality of life and health in elderly individuals. Walking decreases the injuries that occur by falls in elderly individuals, improves balance and coordination, increases muscle strength, regulates glycemic control, improves short-term memory, prolongs attention span, and improves spiritual well-being, sleep, and quality of life (9).

Walking is an important practice recommended by health professionals for reducing sleep problems and improving sleep and quality of life in elderly individuals. Studies have reported a positive correlation between exercise and sleep (10) and quality of life (9). Although studies have investigated the effect of walking on quality of life and sleep of elderly individuals, very few studies in Turkey have provided clear guidance on public health and clinical interventions positively influencing quality of life, and evidence supporting walking activity. Therefore, the present study is important as it is, to the best of our knowledge, the first study in Turkey where healthy elderly individuals are included in the walking program.

The main aim of this study was to identify the impacts of walking program, on quality of life in elderly individuals. The secondary target included assessment the impact of the walking program on sleep quality.

MATERIALS AND METHOD

Study design and sample selection

This is a randomized controlled experimental study. The study comprised 71 elderly individuals

living in a nursing home in Hatay province of Turkey. In determining sample size, the program G*Power 3.1 was used. Analysis showed that for a 0.05 margin of error, 90% statistical power, and 0.8 effect size the total number of participants should be 56 (28 per group), and in accordance with this, the study sample was formed with 64 participants (32 per group). A total of 64 elderly individuals who met the research criteria and agreed to participate in the study were randomly assigned to the exercise walking group and control group.

Randomization was performed by stratification according to gender, age and physical activity scores. After the gender variable was divided into 2 stratums (female and male), the age variable was divided into 3 stratums (65–74 years, 75–84 years and ≥85 years) and physical activity scores were divided into 3 stratums (<600 MET-min/week=inactive, 600–3000 MET-min/week =minimal active, >3000 MET-min/week=very active). In this case, a total of 2×3×3=18 combinations were made between the variables. In the study, the first female participant (age=65-74 years and physical activity=inactive) was included in the exercise walking group with heads or tails method. The second female (age=65-74 years, physical activity=inactive) was included in the control group. The same path was followed in each new combination. By combining the stratums, the groups were balanced.

Two participants in the exercise walking and control groups were unable to complete the study and were therefore excluded from the final analysis. All procedures were performed between October and December 2018.

Elderly individuals aged 65 years and over who had no visual, hearing, or mental disability; who were able to communicate verbally and answer questions independently; who did not have Alzheimer's and dementia, and any obstacle to walking (insulin-dependent diabetes, diabetic foot, heart failure, advanced hypertension, respiratory system disorders, presence of neuropathy, dialysis patients, etc.); and who agreed to participate in the study were included in the study.

Instruments

Introductory Information Form

This form evaluates the gender, age, smoking status, and daily walking duration of elderly individuals.

International Physical Activity Questionnaire-Short Form

It was developed by Booth (2000) for determining the physical activity level of an individual. The questionnaire evaluates physical activity performed for at least 10 minutes in the last seven days in terms of frequency, duration and intensity, and enables the calculation of the MET (metabolic equivalent) value; 1 MET refers to the amount of oxygen used by the individual at rest in sitting position. The questionnaire consists of intense physical activity, moderate physical activity and walking sections. According to the questionnaire, the individual consumes 8.0 MET in "intense physical activity," 4.0 MET in "moderate physical activity" and 3.3 MET in "walking activity." In the calculation, the MET coefficients from the related activity group are multiplied by minutes and frequency (days) to obtain the MET value. The multiplied values are collected and the total physical activity value is obtained. Accordingly, those with a weekly MET value below 600 have low physical activity levels, those with a weekly MET value between 600 and 3000 have moderate physical activity levels, and those with a weekly MET value above 3000 have high physical activity levels (10).

Turkish validity and reliability study of the questionnaire was conducted by Savcı et al. (2006) and test and retest reliability were reported as 0.30 and 0.69, respectively (10). In the present study, Cronbach's α was found to be 0.68.

World Health Organization Quality of Life Scale-Elderly Module

Developed by Power et al. (2005), this scale consists of 24 items. There are six subscales and each item is rated on a 5-point Likert-type scale. These subscales are; sensory functions, autonomy, past-present-future activities, death and dying, social participation and intimacy. Possible subscale scores range from 4 to 20. In addition, total score can be calculated by adding the score of each individual item. Higher scores indicate higher quality of life (12).

Turkish reliability and validity study of the scale was conducted by Eser et al. (2010) and Cronbach's α reliability coefficient was reported as 0.85 (12). In the present study, Cronbach's α value was found to be 0.83.

Pittsburgh Sleep Quality Index

Pittsburgh Sleep Quality Index (PSQI) is a self-report scale developed by Buysse (1989) for assessing sleep quality and sleep disturbance. It comprised 24 items. Each item is scored from 0 to 3 on a Likert-type scale of seven subscales. The subscales are subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleep medications, and daytime dysfunction. The sum of the subscale scores gives the total PSQI score. The total PSQI score is between 0 and 21. Those with a PSQI score less than 5 are considered to have "good" sleep quality, whereas those with a PSQI score more than 5 are considered to have "poor" sleep quality (11).

Turkish validity and reliability study of the scale was conducted by Ağargün et al. (1996) and Cronbach's α reliability coefficient was reported as 0.80 (11). In the present study, Cronbach's α value was found to be 0.81.

Implementation

The participants in the exercise walking group completed the eight-week walking program. The program was conducted by a single researcher. The program was applied twice a week. A compensation session was held once a week for participants who could not attend the program for any reason. Two people who could not regularly attend the 8-week walk program were withdrawn from the exercise walking group and two people who did not take the post-test were withdrawn from the control group, and the study was completed with 60 participants.

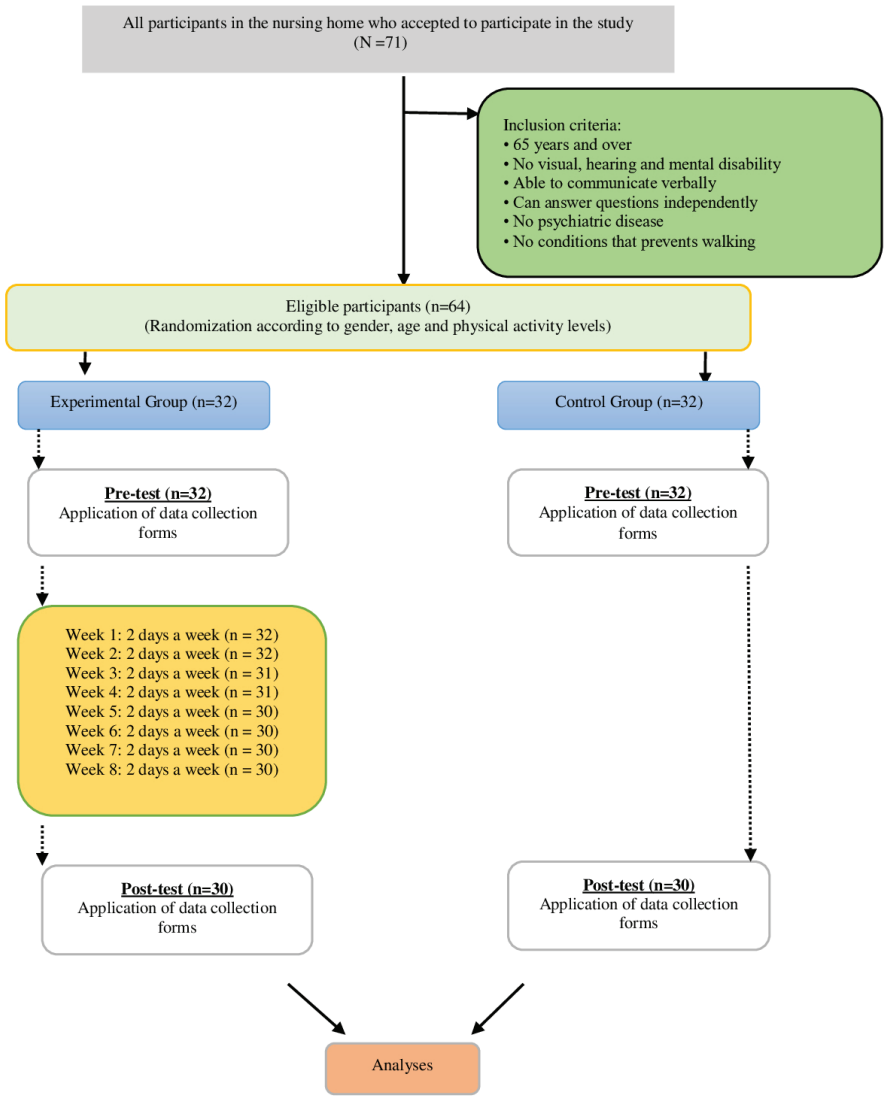
Walking program was conducted in the early morning hours in warm weather and at midday in cold weather. The garden of the nursing home where the study was conducted was chosen as the walking area. Walking tracks with flat floors around the garden were used. Elderly individuals were encouraged for fluid intake before, during and after exercise, and water was provided in the participants in small bottles.

Walking program was created as recommended by the American College of Sports Medicine. The "intensity" of the walk did not exceed 50% of the elderly individual's maximum heart rate. It was increased by 5% every two weeks, but never exceeded 70%. "Maximum heart rate" was calculated by the following formula: "220−age." The tolerance of elderly individuals to walking was evaluated by speech test. Moderate intensity walking activity was determined as the activity level where elderly individuals had no difficulty in talking to the person next to him/her without having breathlessness (13).

In each session, a 5-minute warm-up exercise, a 30-minute walking program, and a 5-minute cooling exercise were performed. The 30-minute walking exercise was divided into three sections of 10-minute periods and elderly individuals were rested for a short time after 10 minutes.

Elderly participants in the control group did not participate in the walking program during the study period. Once the walking program was completed, the same data collection forms were applied to the exercise walking and control groups by the researchers (Figure 1).

Figure 1. Flow chart of the participants during the study



Data analysis

The data obtained in this study were analyzed using Statistical Package for Social Sciences version 21.0 program. Descriptive statistics included frequency, percentage, and mean. Distribution of data was analyzed by Kolmogorov–Smirnov test. The independent samples t-test was used for comparing the mean values between the groups and the paired sample t-test was used for comparing the mean values within the groups. $P < 0.05$ was accepted as statistically significant in all analyses.

Ethical issues

Hatay Mustafa Kemal University Ethical Committee approved this study (Protocol No:2018/150). Before the study began, all participants were informed of objectives and procedures of the study. Written informed consent was obtained from all participants. The study was conducted in accordance with the principles of the Declaration of Helsinki. Participation in this study was voluntary.

RESULTS

Two participants in the exercise walking and control groups were unable to complete the study and were therefore excluded from the final analysis. The study was completed with 23 elderly women (mean age=73.56, sd=8.25) and 37 elderly men (mean age=71.91, sd=7.98). Most of the exercise walking group (63.3%) consisted of males. Of the participants in this group, 60% had graduated from either primary or secondary school. Most (80%) were widowed or divorced. It was found that 53.3% of the participants in the exercise walking group had chronic disease (colorectal cancer, hypertension, diabetes mellitus, cardiovascular diseases, etc.).

Most of the control group (60%) consisted of males. Of the participants in this group, 46.7% had graduated from either primary or secondary school. Most (70%) were widowed or divorced. It was found that 56.7% of the participants in the control group had chronic disease (hypertension, diabetes mellitus, cardiovascular diseases, chronic kidney diseases, etc.).

There was no significant difference in gender, education, marital status, smoking, chronic disease and regular check-up between the groups (p>0.05; Table 1).

Table 1. Participants' descriptive characteristics.

Variable	Exercise walking group		Control group		χ2 / P*
	n	%	n	%	
Gender					
Female	11	36.7	12	40.0	χ2=.071
Male	19	63.3	18	60.0	P=.791
Education					
Literate	8	14.6	10	33.3	
Primary or secondary school	18	60.0	14	46.7	χ2=1.122
High school or university	4	13.4	6	20.0	P=.571
Marital status					
Married	6	20.0	9	30.0	χ2=0.800
Widowed or divorced	24	80.0	21	70.0	P=0.371
Smoking					
Yes	11	36.7	8	26.7	χ2=0.693
No	19	63.3	22	73.3	P=0.405
Chronic disease					
Yes	16	53.3	17	56.7	χ2=0.067
No	14	46.7	13	43.3	P=0.795
Regular check-up					
Yes	22	73.3	25	83.3	χ2=0.884
No	8	26.7	5	16.7	P=0.347
Total	30	100.0	30	100.0	

*p=Pearson Chi-Square test.

After the exercise walking program, the daily walking duration of the experimental group increased and a statistically significant difference was found between the pre-treatment and post-treatment scores (t=-7.729, p<0.001). In addition, the quality of life scale score of the experimental group increased after the exercise walking program and a statistically significant difference was found between the pre-treatment and post-treatment scores (t=-4.182, p<0.001). Furthermore, the PSQI scores of the exercise walking group decreased after the walking program and a statistically significant difference was found between the pre-treatment and post-treatment scores (t=3.745, p=0.001) (Table 2).

There was no significant difference between the pre-treatment and post-treatment scores of the control group in terms of daily walking duration, quality of life and PSQI (p>0.05, Table 2).

When the change in scores after treatment of the exercise walking group and control groups were examined, a statistically significant difference was found between the two groups in terms of daily walking duration (t=8.450, p<0.001), quality of life (t=5.631, p<0.001), and PSQI (t=3.960, p<0.001) (Table 2). In addition, statistically significant differences were found in all other dimensions of quality of life except death and drying subscale after treatment (p<0.001, Table 2).

Table 2. Mean pre-treatment and post-treatment scores of the exercise walking group and control group.

Scales	Exercise Walking Group		Control Group		t-Test and p* value	t-Test and p* value	t-Test and p* value
	Pre-treatment mean±sd	Pre-treatment mean±sd	Pre-treatment mean±sd	Pre-treatment mean±sd			
Walking duration	6.50±10.90	32.16±13.43	7.0±11.16	6.0±10.35	t=-7.729 p<0.001	t=1.000 p=0.326	t=8.450 p<0.001
Quality of Life Scale	71.26±11.83	81.30±2.87	67.36±11.43	66.66±10.95	t=-4.182 p< 0.001	t=1.481 p=0.149	t=5.631 p<0.001
Sensory functions	9.93±2.30	7.10±1.21	9.46±2.63	9.26±2.95	t=5.533 p<0.001	t=1.439 p=0.161	t=-3.711 p<0.001
Autonomy	14.56±2.43	17.90±1.34	13.0±3.26	13.03±3.20	t=-7.315 p<0.001	t=-1.000 p=0.326	t=7.677 p<0.001
Post-present-future activities	12.93±3.89	17.03±1.69	12.56±3.41	12.40±3.46	t=-5.659 p<0.001	t=0.724 p=0. 475	t=6.589 p<0.001
Social participation	11.93±3.76	17.16±1.17	11.83±3.44	11.66±3.08	t=-6.949 p<0.001	t=0.595 p=0.556	t=9.114 p<0.001
Death and drying	9.06±4.60	8.40±1.54	8.83±4.14	8.70±4.0	t=0.968 P=0.341	t=0.724 P=0.475	t=-0.382 p=0.704
Intimacy	12.83±3.49	17.46±1.30	11.66±3.37	11.60±3.60	t=-6.709 p< 0.001	t=0.338 p=0.738	t=8.377 p<0.001
PSQI	6.56±3.80	4.33±2.39	7.73±4.05	7.76±4.09	t=3.745 p=0.001	t=-0.273 p=0.787	t=3.960 p<0.001

* The comparison of pre-treatment and post-treatment scores of the scales in the exercise walking group

** The comparison of pre-treatment and post-treatment scores of the scales in the control group

***The comparison of scores post treatment in the exercise walking and control groups

DISCUSSION

Walking exercise programs have significant effects on elderly individuals (13, 14). These effects may improve quality of life and sleep quality in elderly individuals.

Walking activity is a changeable behavioral risk factor associated with quality of life and health. Walking programs increase the quality of life of individuals. In this study, the walking program was associated with an increase in the quality of life of elderly individuals. The increased quality of life score after walking showed that the individual felt better and developed positive emotions. In their meta-analysis, Chou et al. (2012) reported that exercise is beneficial in increasing gait speed, improving balance, and improving performance in older adults and it positively affects quality of life (15). Awick et al. (2015) reported that walking exercise in elderly individuals was more efficacious in improving quality of life compared with flexibility and stretching exercises (8). Another study showed a positive association between walking and quality of life; however, this relationship varied according to duration and intensity (16).

Recent studies have also focused on the relationship between quality of life and walking duration (17, 18). In this study, a 40 minute (twice a week) and medium intensity walking activity increased the quality of life of the participants. A randomized controlled longitudinal study reported that walking 30 minutes five days a week raised the quality of life of elderly patients and improved physical and cognitive function, as well as reduced anxiety. Other similar studies have shown that moderate walking (18) done for at least 150 minutes per week (19) enhanced the quality of life in the elderly. Another study demonstrated that a group that engaged in high intensity walking had a better quality of life than one that engaged in moderate walking (20). It is quite clear from the studies that frequency and intensity of exercise required to improve the quality of life vary in the context of elderly. Further targeted longitudinal intervention based studies are required to investigate the impact of intensity, frequency and duration of walking exercise that is required to improve quality of life.

Furthermore, in the study the walking program provided improvement in most of the parameters measuring quality of life (sensory functions, autonomy, post-present-future activities, social participation, and intimacy). Research evaluating the effect of walking exercise on the quality of life parameters using WHO-quality of life scale of nursing home residents has been limited. Moreover, there are no studies, experimental or semi-experimental, that examine the impact of walking on the parameters of quality of life. There have, however, been efforts at examining them through descriptive-cross-sectional studies.

Sensory function is an area having an impact on the quality of life. Efforts have been made to study the relationship between sensory function and changes in the senses of sight, hearing, taste, smell and touch in the elderly, and the impact of their loss on quality of life. In this study, the sensory function scores of the elderly declined after a walking exercise program. In a cross-sectional study done by Altay, Çavuşoğlu and Çal (2016) that examined the factors impacting health, the perception of health and the quality of life in the elderly, persons who perceived their health as being good had the lowest score on the sensory function parameter (21). This can be attributed to the elderly perceiving their health to be better after engaging in a walking exercise program.

Another parameter of quality of life is autonomy. Autonomy means the elderly being able to take care of themselves at advanced ages. In this study, the autonomy scores of the elderly rose following a walking exercise program. This finding can be attributed to the exercise of walking enabling the elderly to be more autonomous, be more in control of their lives, and be able to freely do what they want to do.

The study asked participants about their feelings and thoughts about how successful they were in past activities, as well as present and future ones. It wanted to find out whether a sense of achievement had any impact on how satisfied they felt with their lives and how they thought about their past and future. The study showed parameter

of past-current-future activities increased in the elderly who participated in the walking exercise program. It is believed that because of the walking program, elderly participants were able to recall happy memories, which had a positive current impact on their quality of life.

One major indicator of quality of life is social participation. It has a significant role in how the elderly views their use of time and in getting them to engage in important activities. This study demonstrated that the social participation score of the elderly included in it increased following a walking exercise program. A systemic study done by Meads and Exley (2018) showed that walking interventions aimed at buttressing social networks and encouraging changes in behavior significantly increased social participation (22). It is thought that quality of life will improve by the social participation achieved by walking in a group.

In this study, the parameters having the lowest score are those related to death and dying. It investigated the extent to which death was accepted as inevitable and the meaning it held for the participants. It found that following the walking exercise program, there was no statistically significant difference in the quality of life score on the parameters of death and dying. This means that prior to the walking exercise program, the elderly had already accepted the inevitability of death and were prepared for it. It is thought that religious belief played a major role in this outcome.

Another parameter of quality of life is "intimacy." Intimacy has to do with the relationships the elderly have with other people and the social support they derive from them. Having good health, sound relations with friends and family, financial security, professional achievement and intimacy all contribute to improved quality of life. This study showed that the intimacy score of the elderly who had participated in the walking exercise program increased. In a study done by Altay, Çavuşoğlu, and Çal (2016), the elderly received the highest quality of life score from intimacy (21). Therefore, walking programs are recommended as a way to improve the interaction of the elderly with other people.

In the present study, the sleep quality of elderly individuals in the exercise walking group was significantly improved following the walking program, in contrast to that in the control group. In a study conducted by Melancon et al. (2015), elderly men participated in a 60-minute moderate intensity walking program for 16 weeks (3 days a week). At the end of the study, it was reported that sleep time and sleep depth increased, and total wake time decreased (23). In a study by Karimi et al. (2016), 30-minute walking exercises were performed by elderly men 3 times a week for 8 weeks and the sleep quality of the participants was reportedly positively affected (24). In a meta-analysis, Yang et al. (2012) found that walking had a moderate positive effect on sleep quality of elderly individuals and recommended walking as an alternative or complementary approach to existing treatments for sleep problems (25). The findings of the present study are consistent with the findings of another study where a positive effect on sleep quality was detected in the exercise walking group participating in the walking program (14). Consistent with the literature, our results showed that walking program affects sleep quality.

There is a limitation of the study. The control group did not receive any placebo, so a placebo effect could not be tested. This may have reduced the motivation of the control group.

In conclusion; the results indicated that the walking program had a positive effect on the quality of life of nursing home residents. Moreover, the results of this study suggest that a walking program can improve sleep quality in elderly individuals. Nurses can use exercise walking as an intervention to improve the sleep and quality of life of elderly individuals living in nursing homes.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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RESEARCH

AGEISM-RELATED ATTITUDES OF PARAMEDIC STUDENTS AND PROFESSIONALS

Abstract

Introduction: This study was conducted to determine ageism-related attitudes of paramedics working at the 112 emergency ambulance services and students attending the paramedic programmes.

Materials and Method: The sample universe of this cross-sectional study consisted of the paramedics working at İzmir Provincial Medical Emergency Service Department as well as the students attending the paramedic programmes of three universities in the province of İzmir. No specific sampling was done because the intention was to cover the entire sampling universe. The total number of the participants were 501 (305 students and 196 professional paramedics). The Ageism Attitude Scale, the validity and reliability of which was tested by Yılmaz, was used as the data collection tool. Collection time area of this work was between March-April 2019.

Results: Of the professional paramedics and paramedic students who participated in the study, 61.3% were female. The paramedics had a mean scale score of 84.36±9.57 and they had positive ageism-related attitudes. The 'Positive Ageism', 'Negative Ageism' and 'Total Ageism' scores of the professional paramedics were found to be higher. The female participants were found to have significantly higher 'Restricting the Life of the Elderly' scores whereas male participants had significantly higher 'Positive Ageism' scores. Of the female professional paramedics and paramedic students, the female professional paramedics had significantly higher 'Positive Ageism', 'Negative Ageism' and 'Total Ageism' scores. Transition from being student to professional working life and seniority in employment led to an increase in positive attitudes towards ageism.

Conclusion: It was concluded that the professional paramedics and paramedic students had generally positive ageism attitudes.

Keywords: Allied Health Personnel; Attitude; Ageism; Aged.

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ARAŞTIRMA

ÖĞRENCİ VE ÇALIŞAN PARAMEDİKLERİN YAŞLI AYRIMCILIĞINA İLİŞKİN TUTUMLARI

Öz

Giriş: Bu çalışma 112 ambulanslarında görev yapan paramediklerin ve paramedik programı öğrencilerinin yaşlı ayrımcılığı ilişkin tutumunu belirlemek amacıyla yapılmıştır.

Gereç ve Yöntem: Kesitsel tipte olan bu araştırmanın evreni, İzmir İl Ambulans Servis Başhekimliğinde çalışan paramedikler ve İzmir ilinde paramedik programı bulunan üç üniversitede okuyan öğrencilerden oluşmuştur. Örnek seçimi yapılmamış, evrenin tamamına ulaşmak hedeflenmiştir. Çalışmanın katılımcıları 305 öğrenci, 196 çalışan paramedik olmak üzere toplam 501 kişiden oluşmuştur. Bilgi toplama aracı olarak Yılmaz tarafından geçerlilik ve güvenilirlik çalışması yapılmış olan 'Yaşlı Ayrımcılığı Tutum Ölçeği' kullanılarak veriler elde edilmiştir. Çalışmanın verileri Mart-Nisan 2019 tarihleri arasında toplanmıştır.

Bulgular: Araştırmaya alınan öğrenci ve çalışan paramediklerin %61.3'ü kadındır. Paramediklerin ölçek puan ortalaması 84.36±9.57 olup yaşlı ayrımcılığına ilişkin tutumlarının olumlu olduğu görülmüştür. Çalışan paramediklerin 'olumlu ayrımcılık', 'olumsuz ve toplam ayrımcılık' ölçek puanları yüksek bulunmuştur. Çalışmaya alınan kadınların 'yaşamını sınırlama', erkeklerin 'olumlu ayrımcılık' puanı anlamlı bir şekilde yüksek bulunmuştur. Cinsiyeti kadın olan öğrenci ve çalışan paramedikler arasında çalışan kadınların anlamlı bir şekilde 'olumlu, olumsuz ve toplam ayrımcılık' puanları yüksek bulunmuştur. Öğrenci olmaktan iş hayatına geçişin, iş yaşamında da kıdem yılının artmasının yaşlı ayrımcılığına ilişkin olumlu tutumun artmasına neden olduğu görülmüştür.

Sonuç: Genel olarak öğrenci ve çalışan paramediklerin yaşlı ayrımcılığına ilişkin tutumlarının olumlu olduğu sonucuna ulaşılmıştır.

Anahtar Sözcükler: Paramedik; Tutum; Yaşlı Ayrımcılığı; Yaşlı.

INTRODUCTION

The proportion of population aged ≥ 65 years in the total population is gradually increasing worldwide as well as in Turkey (1). According to the 2018 data of the Turkish Statistical Institute, the rate of population aged ≥ 65 years was 8.7%; this rate is estimated to be 10.2% by 2023 (2).

Health problems are increasing in parallel with the increase in the elderly population (3). Therefore, as they apply to all health institutions, elderly patients also apply to 112 ambulance services and receive emergency medical services (4).

In Turkey, the rate at which patients aged 65 and above use ambulance services varies between 6% and 40% (4-6). This rate was reported to be 38% and 48% in the US and Japan, respectively (7, 8). Depending on the changes in the population, it is estimated that the use of ambulance services by the elderly will increase. Consequently, it is essential for emergency medical services (EMS) to develop tools to ensure the care of these patients (9, 10).

The 112-emergency telephone number is a building block of the EMS. It is essential that EMS is offered to all people throughout the country for 24 hours without interruption, as quickly as possible, and with a team approach. The 112 ambulance services performs the duty of carrying patients and injured persons from the site to a medical facility and they employ physicians, emergency medical technicians and paramedic as healthcare personnel. In Turkey, paramedics can be defined as the healthcare personnel who finish the first aid and emergency services programme (paramedic programme) at the vocational schools of healthcare services of universities (11).

Changes in the sociocultural system, attitudes and behaviours of society as well as perceptions of individuals and society about old age influence the services provided to the elderly and may create various problems. Ageism, particularly faced by the elderly, is among these problems (12).

Today, the aged people are exposed to ageism in many societies around the world. This form of discrimination is the result of negative attitudes harboured by society, family members and other people, particularly including younger individuals against the elderly and old age in general (13).

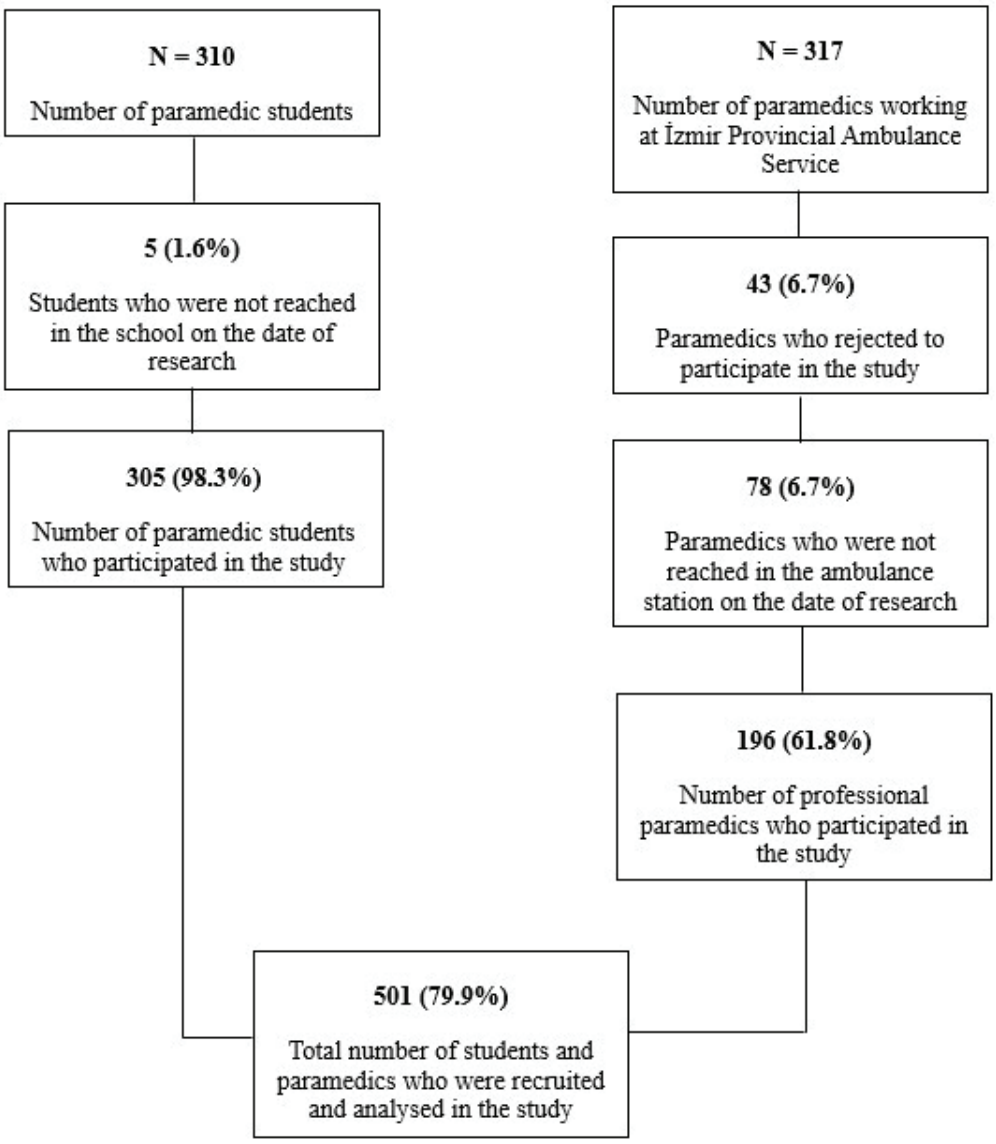
This makes it crucial to identify ageism attitudes of paramedics who work or will work at the 112 ambulance services, providing 24-hour EMS to all age groups in society. This study was conducted to determine ageism attitudes of paramedics working at the 112 ambulance services and the students attending the paramedic programmes.

MATERIALS AND METHOD

This descriptive study was conducted with the paramedics working at İzmir Provincial Medical Emergency Service Department along with the students attending the paramedic programmes of three universities in the province of İzmir. No specific sampling was done for this study because the intention was to cover the entire sampling universe. Those who refused to participate in this study and those who were not at the school or the 112-ambulance station at the date the study was conducted were excluded in the study. The flowchart for the sampling universe of the study is shown in Figure 1.

The Ageism Attitude Scale (AAS), the validity and reliability of which was tested by Yılmaz, was used as the data collection tool. The AAS is a 5-point Likert-type scale comprising the following choices for each item: 'Strongly Disagree', 'Disagree', 'Undecided', 'Agree' and 'Strongly Agree'. Designed as a self-reflexive tool, the AAS has 23 items and three sub-scales. The sub-scale 'Restricting the Life of the Elderly' has 9 items while the sub-scales 'Positive Ageism' and 'Negative Ageism' have 8 and 6 items, respectively. The highest and lowest scores that can be obtained from this scale are 115 and 23, respectively.

Figure 1. Flowchart showing the derivation of the sample used in this study.



Accordingly, the highest and lowest scores are 45 and 9, respectively, for the sub-scale 'Restricting the Life of the Elderly', 40 and 8 for the sub-scale 'Positive Ageism' and 30 and 6 for the sub-scale 'Negative Ageism.' Higher scores from the scale show positive attitudes and lower scores indicate negative attitudes concerning ageism (13).

Previous studies on this subject were used for determining the independent variables of the present study. Gender was selected as an independent variable because of the biological and psychological differences between the two genders. Work experience was selected as an independent variable because of the changes in

the perspective and attitudes towards the elderly and elderly patients as age progresses. Lastly, monthly income of the family was selected as an independent variable as it may cause difficulties in meeting personal needs.

The data from the paramedic students were collected in the classroom under the supervision of the author. The data from the professional paramedics were collected by contacting the 112 ambulance stations under the supervision of the author. Collection time area of this work was between March-April 2019 (60 days). The participants were briefed about the study and only those who volunteered to participate were included in the study. All the voluntary participants signed written consent forms.

The data were analysed using the Statistical Package for the Social Sciences for Windows software package, version 18.00. Descriptive statistics, Mann–Whitney U test, one-way analysis of variance and Kruskal–Wallis test were used in the analysis.

This study was approved by Non-Invasive Research Ethics Committee of the university (30-01-2019, 2019/02-20).

RESULTS

Of the professional paramedics and paramedic students who participated in the study, 61.3% were female. The mean age was 19.8±1.51 for paramedic students and 30.2±5.52 for professional paramedics. It was found that of the participants, 90.7% lived in nuclear families; 32.2% had a family income of TL TRY 5,001 and above; 28.3% had a family member aged 65 and above; 45.5% lived with a person aged 65 and above in the same house during part of their lives and 55.4% lived in a province for a significant proportion of their lives.

The AAS total and sub-scale scores of the professional paramedics and paramedic students are shown in Table 1. The paramedics were found to have positive attitudes regarding ageism.

Table 1. General Characteristics of Patients.

Scale	Professional paramedics and paramedic students (n=501)		
	Lowest	Highest	$\overline{X}$ ± S
Restricting the life of the elderly	13.00	45.00	37.10±4.66
Positive ageism	8.00	40.00	29.55±5.32
Negative ageism	6.00	30.00	17.70±3.87
Total ageism	57.00	110.00	84.36±9.57

Table 2. Comparison professional paramedics and paramedic students based on AAS total and sub-scale scores.

Scale	Paramedic students (n=305)			Professional paramedics (n=196)			
	Lowest	Highest	$\overline{X} \pm S$	Lowest	Highest	$\overline{X} \pm S$	
Restricting the life of the elderly	13.00	45.00	36.78±4.80	22.00	45.00	37.61±4.40	Z= −1.72 p= 0.08
Positive ageism	8.00	40.00	29.08±5.57	16.00	40.00	30.28±4.81	Z= −2.51 p= 0.01
Negative ageism	6.00	30.00	17.28±3.72	9.00	29.00	18.36±4.01	Z= −2.88 p= 0.00
Total ageism	57.00	110.00	83.14±9.45	63.00	110.00	86.25±9.57	Z= −3.40 p= 0.00

The comparison of AAS total and sub-scale scores of the professional paramedics and paramedic students is present in Table 2. The 'Positive Ageism', 'Negative Ageism' and 'Total Ageism' scores of the professional paramedics were found to be higher.

The comparison of the descriptive characteristics of the participants based on AAS total and sub-scale scores is given in Table 3. The female participants were found to have higher 'Restricting the Life of the Elderly' scores whereas male participants had higher 'Positive Ageism' scores. It was observed that there were significant differences between the 'Positive Ageism' and 'Total Ageism' scores based on age groups and this difference was attributable to the group aged 31 and above. Significant differences were found between the 'Restricting the Life of the Elderly' and 'Negative Ageism' scores based on family monthly income and this difference was attributable to the group aged TRY 5,001 and above. Moreover, significant differences were found between the 'Restricting the Life of the Elderly' and 'Total Ageism' scores based on the duration of education and employment, and this difference was due to the group '11 years and above.'

The comparison of AAS total and sub-scale scores of the professional paramedics and paramedic students based on their descriptive characteristics is shown in Table 4. The 'Positive Ageism', 'Negative Ageism' and 'Total Ageism' scores of the working female paramedics were found to be higher. This was also the case for the paramedics in a nuclear family. The professional paramedics who had a family member aged 65 and above had higher 'Positive Ageism' and 'Total Ageism' scores while those who did not such a family member had higher 'Negative Ageism' and 'Total Ageism' scores.

Table 3. Comparison of the descriptive characteristics of the participants based on AAS total and sub-scale scores.

Variable	n	Restricting the life of the elderly	Positive ageism	Negative ageism	Total ageism
		$\overline{X} \pm S$	$\overline{X} \pm S$	$\overline{X} \pm S$	$\overline{X} \pm S$
Gender					
Female	194	37.43±4.50	29.11±5.05	17.73±3.88	84.27±9.18
Male	307	36.59±4.87	30.24±5.66	17.66±3.86	84.49±10.17
		Z = −2.08 p = 0.03	Z = −2.62 p = 0.00	Z = −0.04 p = 0.96	Z = −0.26 p = 0.78
Age group					
20 years and below	238	37.09±4.54	29.11±5.35	17.47±3.68	83.67±9.15
21–30 years	177	36.74±4.52	29.74±5.07	17.30±3.81	83.78±9.38
31 years and above	74	38.18±4.39	30.20±5.31	19.57±3.80	87.95±10.0
		Z = −1.61 p = 0.10	Z = −1.86 p = 0.06	Z = −4.38 p = 0.00	Z = −3.21 p = 0.00
Family type					
Nuclear	446	37.25±4.62	29.48±5.16	17.76±3.89	84.48±9.38
Extended	45	36.47±4.74	30.69±5.98	17.19±3.79	84.31±11.39
		Z = −1.28 p = 0.19	Z = −1.58 p = 0.11	Z = −1.12 p = 0.26	Z = −0.12 p = 0.90
Family monthly income (₺)					
3,000 and below	169	37.42±4.15	29.26±5.23	17.38±3.59	84.06±8.74
3,001–5,000	166	36.32±5.06	29.69±5.50	17.37±3.87	83.37±10.08
5,001 and above	159	37.57±4.72	29.69±5.34	18.48±4.05	85.75±9.87
		KW = 7.43 p = 0.02	KW = 1.12 p = 0.56	KW = 7.78 p = 0.02	KW = 5.13 p = 0.07
Family member aged 65 and above					
Yes	141	37.74±3.97	30.76±5.30	17.46±3.73	85.96±9.59
No	358	36.85±4.90	29.07±5.27	17.82±3.92	83.73±9.52
		Z = −1.36 p = 0.17	Z = −3.16 p = 0.00	Z = −0.99 p = 0.32	Z = −2.21 p = 0.02
Having a person aged 65 and above living in the same house					
Yes	227	37.42±4.73	29.88±5.42	17.93±3.96	85.23±9.46
No	272	36.84±4.90	29.26±5.24	17.53±3.79	83.64±9.65
		Z = −1.16 p = 0.24	Z = −1.45 p = 0.14	Z = −1.03 p = 0.30	Z = −1.74 p = 0.08
Duration of living a person aged 65 and above living in the same house					
2 years and below	64	37.19±4.41	29.41±5.75	17.91±4.53	84.50±9.26
2–4 years	40	36.60±4.51	28.72±5.31	17.70±3.52	83.03±9.72
4 years and above	123	37.80±4.29	30.50±5.23	18.02±3.80	86.33±9.38
		KW = 3.41 p = 0.18	KW = 4.82 p = 0.09	KW = 0.10 p = 0.95	KW = 4.59 p = 0.10
Duration of education or employment					
Student	306	36.78±4.80	29.08±5.57	17.28±3.72	83.14±9.45
5 years and below	58	36.93±4.12	30.34±4.35	16.84±4.06	84.12±8.43
6–10 years	72	37.74±4.59	29.89±4.56	18.65±4.12	86.25±9.73
11 years and above	65	38.03±4.44	30.63±5.51	19.38±3.51	88.05±9.79
		KW = 5.39 p = 0.14	KW = 7.52 p = 0.05	KW = 23.96 p = 0.00	KW = 16.65 p = 0.00
Place of living					
Province	276	36.93±4.92	29.16±5.65	17.73±4.01	83.82±9.85
District	163	37.36±4.36	29.98±4.86	17.75±3.55	85.09±9.31
Village	59	37.15±4.36	30.24±4.91	17.51±4.10	84.90±9.59
		KW = 0.13 p = 0.93	KW = 2.74 p = 0.25	KW = 0.25 p = 0.89	KW = 1.42 p = 0.49

Table 4. Comparison of AAS total and sub-scale scores of the professional paramedics and paramedic students based on their descriptive characteristics.

Variable		n	Restricting the life of the elderly	Positive ageism	Negative ageism	Total ageism
			$\overline{X}$ ± S	$\overline{X}$ ± S	$\overline{X}$ ± S	$\overline{X}$ ± S
Gender						
Female	**Student**	182	37.02±4.59	28.41±5.19	17.28±3.83	82.71±8.96
	Working	125	38.02±4.32	30.14±4.67	18.38±3.87	86.54±9.05
			Z = −1.80 p = 0.07	Z = −3.15 p = 0.00	Z = −2.40 p = 0.01	Z = −3.55 p = 0.00
Male	**Student**	123	36.41±5.09	30.07±5.99	17.28±3.56	83.77±10.14
	Working	71	36.89±4.48	30.54±5.08	18.32±4.27	85.75±10.17
			Z = −0.37 p = 0.70	Z = −0.33 p = 0.74	Z = −1.61 p = 0.10	Z = −1.08 p = 0.27
Family type						
Nuclear family	**Student**	270	36.95±4.78	29.13±5.42	17.30±3.68	83.38±9.14
	Working	176	37.70±4.35	30.02±4.78	18.46±4.10	86.18±9.52
			Z = −1.36 p = 0.17	Z = −1.79 p = 0.07	Z = −2.89 p = 0.00	Z = −2.90 p = 0.00
Extended family	**Student**	33	35.55±4.88	29.30±6.12	17.03±4.10	81.88±11.56
	Working	12	39.00±3.30	34.50±3.50	17.50±2.87	91.00±8.00
			Z = −2.17 p = 0.02	Z = −2.59 p = 0.00	Z = −0.54 p = 0.58	Z = −2.55 p = 0.01
Family member aged 65 and above						
Yes	**Student**	70	37.21±3.96	30.37±5.54	16.54±3.31	84.13±9.45
	Working	71	38.27±3.94	31.14±5.06	18.37±3.91	87.77±9.44
			Z = −1.66 p = 0.09	Z = −1.32 p = 0.18	Z = −2.84 p = 0.00	Z = −2.67 p = 0.00
No	**Student**	235	36.65±5.02	28.70±5.54	17.50±3.81	82.85±9.46
	Working	123	37.24±4.66	29.77±4.64	18.41±4.08	85.42±9.46
			Z = −0.84 p = 0.39	Z = −1.42 p = 0.15	Z = −1.88 p = 0.06	Z = −1.89 p = 0.05
Having a person aged 65 and above living in the same house						
Yes	**Student**	131	36.98±4.65	29.30±5.68	17.60±3.98	83.88±9.64
	Working	96	38.02±3.89	30.68±4.96	18.39±3.91	87.08±8.93
			Z = −1.49 p = 0.13	Z = −2.33 p = 0.01	Z = −1.68 p = 0.09	Z = −2.61 p = 0.00
No	**Student**	174	36.63±4.92	28.92±5.51	17.04±3.50	82.59±9.03
	Working	98	37.21±4.88	29.88±4.70	18.41±4.12	85.50±10.00
			Z = −0.94 p = 0.34	Z = −1.05 p = 0.29	Z = −2.35 p = 0.01	Z = −2.03 p = 0.04

DISCUSSION

This study is valuable as it is the first to evaluate professional paramedics and paramedic students together. It was observed that the participating paramedics had positive ageism-related attitudes. In other studies conducted on health care workers in Turkey using the same scale, "Total discrimination score" was found to be 87.0 by Özdemir et al., 86.9 by Şimşek et al., 83.1 by Polat et al., 70.6 by Soyuer et al., and 68.8 by Altay et al. (14-18). In a systematic study, Liu et al. demonstrated that the ageism-related attitudes of healthcare personnel were neutral or positive (19). Doherty et al. demonstrated that healthcare personnel harboured positive attitudes towards the elderly in Ireland. They also found that the working nurses had higher ageism scores than nursing students (20). Ross et al. reported positive attitudes of paramedic students towards the elderly in Australia (21). The present study's findings are consistent with other studies.

Beliefs and attitudes towards old age and elderly people vary from culture to culture. In Turkish culture, respect and obedience to the elderly is a traditional and unchanging expectation. This cultural characteristic was considered as a reason for the high discrimination score in the study. However, the social status of the elderly in Turkish culture varies, particularly in metropolitan areas. The reasons for this variation could be explained by increases in urbanisation, migration and industrialisation, economic difficulties, women's participation in the workforce, changes in individuals' social lives and changes in family structures. In Middle Eastern countries, society accepts male elders as wise and prestigious. Similarly, in many cultures, women's status improves with menopause. In Japan, as the age advances, women's status changes and their role in the home improves. In addition, the amount of tasks at home that need to be performed by women decreases with menopause, and the needs of elderly women are met by young people. Such societies are less affected by ageism. This is because old age and elderly people are adopted as a natural part of the life death cycle in these cultures (12, 22).

When the paramedic students and professional paramedics were groups and their scale scores were analysed, the professional paramedics were found to have high 'Positive Ageism', 'Negative Ageism' and 'Total Ageism' scores. Ross et al. found that paramedic students were respectful towards the elderly, but they still harboured certain negative biases (23). Aşiret et al. demonstrated that nurses had positive attitudes towards elderly patients (24). The findings of this study were found to be consistent with the literature.

Participants aged 31 and above who had a family member aged 65 and above and who had been working for more than 11 years had higher 'Total Ageism' scores. Liu et al. reported higher scores for the nurses aged between 30 and 39 (25). In their study on working nurses and nursing students, Söderhamn et al. indicated that the male participants and the participants aged 25 and below were less positive towards the elderly (26). Likewise, Ross et al. found that the participants aged below 25 had higher negative ageism (21). Doherty et al. could find any correlation between the years in the profession and ageism (20). Ross et al. reported that the participants who had an elderly family member were undecided about ageism (23). Studying the attitudes of nursing students towards the elderly in Greece, Lambrinou et al. demonstrated that the variables of having an elderly family member and living with an elderly person did not have any effect on the attitude towards the elderly (27). Increasing age and increasing years in the profession are concurrent developments. Thus, increasing age has a positive impact on ageism. Divergent findings in certain studies may imply different cultural causes.

Upon comparing paramedic students and professional paramedics on their descriptive characteristics, the higher 'Total Ageism' scores

of the professional paramedics were attributed to the working female paramedics. When the paramedics living in a nuclear or extended family were considered, the 'Total Ageism' scores of the professional paramedics were observed to be higher in both groups. The professional paramedics with a family member aged 65 and above and those who had lived with a person aged 65 and above had higher 'Total Ageism' scores.

This study has some limitations. This study was conducted only on paramedics receiving their education and working in Izmir. Izmir is a developed city located at the western edge of Turkey. Consequently, generalisations related to the results are unsuitable. Nevertheless, this study is important since it is one of the rare studies performed on students and professional paramedics.

In conclusion, paramedics generally demonstrate positive attitudes towards the elderly. Compared with the paramedic students, the professional paramedics had higher positive ageism attitudes towards the elderly. It was found that increasing age and subsequently increased duration of employment and having an elderly person (aged 65 or above) living with the family positively affected ageism. The paramedics' attitudes towards the elderly are not related to their sociodemographic characteristics or working conditions. Increasing the courses or topics for elderly patients within the paramedic education curriculum will further improve this positive attitude towards the elderly. In addition, we believe that the introduction of "Geriatrics Ambulance" services within 112 ambulance services will contribute to positive discrimination of the elderly.

Given the rapidly ageing population in the country and around the world, it is important to ensure that paramedics who will work at 112 emergency ambulance services develop positive ageism-related attitudes.

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RESEARCH

FACTORS RELATED TO FALLS AND THE FEAR OF FALLING AMONG ELDERLY PATIENTS ADMITTED TO THE EMERGENCY DEPARTMENT

Abstract

Introduction: This study was conducted to investigate the fear of falling and admissions related to falls, also the associated factors with each of them among elderly patients who are admitted to the emergency department.

Materials and Method: The population of this study consisted of patients aged 65 years and over who were admitted to the emergency department in August 2015. The measurement tool included questions regarding outcomes, functional state, sociodemographic data, balance and walking problems, and admissions to the emergency department due to falls within the past year which was filled by a trained interviewer via semi-structured interviews with the patients and/or their relatives. The logistic regression was applied for the analysis.

Results: Of the 555 patients who were included in the study, 12.6% were admitted because of falls. Admissions due to falls were associated with admissions to the emergency department over the past year due to falls, living in nursing homes, and fear of falling. The fear of falling was shown in 22.2% of the study group, and it was found to be associated with female sex, marital status, falling status, and better functional state.

Conclusion: There was a significant relationship between falls and the fear of falling among older patients admitted to the emergency department. There is need for further prospective studies to better understand the effect of fear of falling on falls.

Keywords: Accidental Falls; Emergency Service, Hospital; Fear; Geriatrics.

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ARAŞTIRMA

ACİL SERVİSE BAŞVURAN YAŞLI HASTALARDA DÜŞME VE DÜŞME KORKUSU İLE İLİŞKİLİ ETMENLER

Öz

Giriş: Bu çalışma, acil servise başvuran yaşlı hastalarda düşme korkusu ile düşme nedenli başvuruları ve ilişkili faktörleri araştırmak amacıyla planlanmıştır.

Gereç ve Yöntem: Bu araştırmanın evreni, 2015 Ağustos ayı içerisinde acil servise başvuran 65 yaş ve üstü hastalardan oluşmuştur. Başvuru sonuçları, fonksiyonel durum, son bir yılda denge ve yürüme sorunu ile düşme nedenli acil servise başvuru ve sosyodemografik verileri içeren ölçme aracı eğitim alan anketör tarafından acil serviste hasta ve/veya hasta yakınları ile yarı yapılandırılmış görüşme yolu ile doldurulmuştur. Lojistik regresyon analizi uygulanmıştır.

Bulgular: Acil servise başvurarak çalışmaya alınan 555 hastanın %12.6'sı düşme şikayeti ile gelmiştir. Huzurevinde yaşama, düşme korkusu ve son bir yıl içinde düşme nedeni ile acil servise başvurmuş olma düşme ile başvuru ile ilişkili bulunmuştur. Düşme korkusu, çalışmaya alınan yaşlıların %22.2'sinde tespit edilmiş olup; kadın cinsiyet, medeni durum, düşme durumu ve daha iyi fonksiyonel durum ile ilişkili bulunmuştur.

Sonuç: Acil servise başvuran yaşlılarda; düşme ve düşme korkusu arasında anlamlı bir ilişki bulunmuştur. Düşme korkusunun düşme üzerine etkisini daha iyi anlamak için prospektif çalışmalara ihtiyaç vardır.

Anahtar Sözcükler: Düşme; Acil Servis; Düşme Korkusu; Yaşlı.

INTRODUCTION

Although falls are not exclusive to the geriatric individuals (1), it is an important health problem which increases morbidity and mortality among geriatric people (2). Moreover, falls can negatively affect the quality of life (3, 4), cause loss of independence in daily activities and create fear and worry among geriatric people (5). According to a report published by World Health Organization (WHO) in 2007, people aged 65 years and older have an annual falling prevalence of 25%–32%. It has been reported that the prevalence of falling increases with age, and that elderly people living in nursing homes fall more often (4). The demand for emergency medical services also parallelly increases with the increasing number of geriatric population in society. Multiple comorbidities and functional disorders are also prevalent among geriatric patients admitted to the emergency department (ED) (3). In a study conducted to investigate the effects of the risk factors associated with falling on quality of life and activities of daily living (ADL) among geriatric patients, it was found that fear of falling (FOF) is the factor that has the most impact on the mental component of the quality of life, and that it affected ADL to a greater extent than the other factors (6).

There are only a limited number of studies with small samples researched in Turkey examining the FOF and falls among older patients receiving ED care, and to the best of our knowledge, no study has investigated the relationship of FOF and IADL. Besides, little is known about the characteristics of the geriatric patients admitted to ED. Studies on those frail patient groups would lead to better care. So, this study was conducted to determine the FOF and admissions due to falls, also the associated factors with each of them among patients aged 65 years and over who were admitted to the ED.

MATERIALS AND METHOD

The population of this study consisted of patients aged 65 years and over who were admitted to the ED of Dokuz Eylül University (DEU) in Izmir, Turkey, in August 2015. There was no sample selection for the study, and the aim was to reach out to the entire study population. Patients whose general condition was not suitable for interview, those who were sent to the ED from another clinic and those who died in the ED were excluded from the study. For patients who were admitted to the ED more than once, the first admission was included.

A measurement tool suitable for the purposes of the study was prepared by reviewing the literature and acquiring expert opinion. This measurement tool was filled by a trained interviewer through face-to-face interviews with the patients or their relatives.

The dependent variables were the FOF and falls. Age, sex, education, marital status, who they live with, state of falling, having balance and walking problems within the past year, using walking aids, the FOF, how the patient arrived at the ED, visiting the ED within the past year due to falling, outcome in the ED and the ability to perform ADL and instrumental ADL (IADL) were determined. With regards to the FOF, the patients were asked questions on whether they were afraid of falling and whether they were confident while performing daily tasks.

Data were evaluated using the 'SPSS for Windows 18.0'software. Descriptive tables were used to present the variables. The chi-square test was used in comparing the number of admissions to the ED due to falling or other causes with the sociodemographic states, and for comparing the presence of FOF. The number of patients for each variable was shown in the tables for the missing data. Binary logistic regression analysis was applied. A p-value <0.05 was considered significant.

This study was approved by the DEU's Ethics Committee for Non-Interventional Research.

RESULTS

A total number of 9484 patients were admitted to the ED of DEU Hospital in August 2015. Of those patients, 820 (8.6%) were aged 65 years and above. On excluding the elderly patients who were readmitted to the ED, a study population of 755 patients was reached. The chart on how the study population was enrolled is presented in Figure-1 (Figure-1).

Of the 555 patients included in the study, the mean age of the participants was 76.7 ± 7.6 years, and 12.6% were admitted with falls. Other than falls, the most prevalent complaints of the patients were respiratory problems (10.2%), stomach ache (8.8%) and chest pain (6.5%). Patients admitted for falls were admitted to the hospital with trauma diagnosis (90%) at a significantly higher rate than medical diagnosis (10%) (Cardiovascular, gastrointestinal, urinary system, respiratory system, neurological, muscle-skeletal system, toxications, allergical-dermatologic, endocrinological, infections, hematological, ophtalmical- otorhinological diseases were all classified as medical) in comparison with admissions due to other causes [96.7% (admissions classified as medical conditions) vs. 3.3% (trauma diagnosis), p<0.01].

The characteristics of the patients according to whether they were admitted to the ED due to falling or other reasons are shown in Table 1.

Table 1. The characteristics of the patients due to admission cause to the emergency department with falls or other reasons.

Variable	Falls		Other causes		Total		p
	n	%*	n	%*	n	%**	
Gender (n=555)							
Female	39	14.9	222	85.1	261	47.0	0.11
Male	31	10.5	263	89.5	294	53.0	
Age groups (n=555)							
65–74	30	11.7	226	88.3	256	46.1	0.49
75–84	28	12.3	200	87.3	228	41.1	
84 and above	12	16.9	59	83.1	71	12.8	
Marital status (n =549)							
Married	52	11.8	390	88.2	442	80.5	0.36
Single	16	14.9	91	85.1	107	19.5	
State of living (n =542)							
With family	48	11.3	376	88.7	424	78.2	0.16
With children	11	14.3	66	85.7	77	14.2	0.57
Nursing home	5	31.3	11	68.8	16	3.0	0.01

Variable	Falls		Other causes		Total		p
	n	%*	n	%*	n	%**	
Other	3	12.0	22	88.0	25	4.6	0.95
Level of education (n =548)							
Illiterate	6	7.7	72	92.3	78	14.2	0.03***
Elementary school graduate	21	10.5	179	89.5	200	36.5	
Middle school graduate	19	15.0	108	85.0	127	23.2	
High school graduate	14	17.3	67	82.7	81	14.8	
University graduate	10	16.1	52	83.9	62	11.3	
Balance and walking problems (past year) (n=555)							
Yes	7	13.2	46	86.8	53	9.5	0.89
No	63	12.5	439	87.5	502	90.5	
Walking aid use (n=551)							
Yes	13	18.0	59	82.0	72	13.0	0.14
No	57	11.9	422	88.1	479	87	
Fear of falling (n=554)							
Yes	25	20.3	98	79.7	123	22.2	0.00
No	45	10.4	386	89.6	431	77.8	
Admission to the emergency department due to falling in the past year (n=555)							
Yes	9	24.3	28	75.7	37	6.6	0.02
No	61	11.7	457	88.3	518	93.4	
Ability to perform ADL (n=550)							
Yes	67	12.9	450	87.1	517	94.0	0.51
No	3	9.0	30	91.0	33	6.0	
Ability to perform IADL (n=550)							
Yes	62	13.2	407	86.8	469	85.2	0.25
No	7	8.6	74	91.4	81	14.8	

*Row percentage; ** Column percentage; *** Chi-Square in Slope

Table 2. Characteristics of the patients due to fear of falling status.

Variable	Yes		No		Total		p
	n	%*	n	%*	n	%**	
Gender (n=554)							
Female	68	26.2	192	73.8	260	46.9	0.03
Male	55	18.7	239	81.3	294	53.1	
Age groups (n=553)							
65–74	48	18.8	208	81.2	256	46.3	0.11
75–84	54	23.9	172	76.1	226	40.9	
84 and above	21	29.6	50	70.4	71	12.8	
Marital status (n =548)							
Married	106	24.0	335	76.0	441	80.5	0.02
Single	15	14.0	92	86.0	107	19.5	
State of living (n =516)							
With family	101	23.9	322	76.1	423	82.0	0.62
With children	13	16.9	64	83.1	77	14.9	0.14
Nursing home	7	43.7	9	56.3	16	3.1	0.05
Level of education (n =547)							
Illiterate	20	25.6	58	74.4	78	14.3	0.69***
Elementary school graduate	29	14.5	171	85.5	200	36.6	
Middle school graduate	40	31.5	87	68.5	127	23.2	
High school graduate	24	30.0	56	70.0	81	14.6	
University graduate	8	12.9	54	87.1	62	11.3	
Balance and walking problems (past year) (n=554)							
Yes	12	23.1	40	76.9	52	9.4	0.87
No	111	22.1	391	77.9	502	90.6	

Variable	Falls		Other causes		Total		p
	n	%*	n	%*	n	%**	
Walking aid use (n=551)							
Yes	22	28.5	50	71.5	72	13.1	0.06
No	100	20.8	379	79.2	479	86.9	
Falling status (n=553)							
Yes	25	35.7	45	64.3	70	12.7	0.00
No	98	20.2	385	79.8	483	87.3	
Admission to the emergency department due to falling in the past year (n=553)							
Yes	13	35.1	24	64.9	37	6.7	0.05
No	110	21.3	406	78.7	516	93.3	
Ability to perform ADL (n=550)							
Yes	121	23.4	396	76.6	517	94.0	0.02
No	2	6.0	31	94.0	33	6.0	
Ability to perform IADL (n=550)							
Yes	117	24.9	352	75.1	469	85.3	0.00
No	5	6.1	76	93.9	81	14.7	
Distribution according to ED diagnoses (n=553)							
Gastrointestinal	31	26.0	88	74.0	119	21.5	0.25
Cardiac	19	22.0	67	78.0	86	15.6	0.97
Neurologic	13	15.1	73	84.9	86	15.6	0.08
Other	60	22.9	202	77.1	262	47.3	0.72

Characteristics of the patients due to fear of falling status

Out of all, 22.2% of the patients had FOF. The characteristics of the patients with FOF are shown in Table 2.

In the logistic regression analysis; admission with falls to the ED was associated with admissions from nursing homes (OR = 3.4, p = 0.01, 95% CI =1.14-10.11), the FOF (OR = 2.18, p<0.01 , 95% CI =1.27-3.74), and admission to ED with a fall in the past year (OR =2.4, p =0.02, 95% CI = 1.08-5.34), where the FOF was associated with female gender (OR =1.53, p<0.01, 95% CI =1.02-2.29), being married (OR = 1.94, p =0.02, 95% CI =1.07-

3.49), history of a fall (OR =2.18, p <0.01, 95% CI =1.27-3.73), and the abilities to perform ADL (OR =4.74, p = 0.01, 95% CI = 1.12-20.12) and IADL (OR = 5.06, p <0.01, 95% CI = 2.00-12.82) (Table 3 and 4).

Table 3. General Characteristics of Patients.

Variable	Beta	p	OR	95% CI
Living in nursing home	1.224	0.01	3.40	1.14-10.11
Presence of fear of falling	0.783	<0.01	2.18	1.27-3.74
Presence of admission to the emergency department due to falling in the past year	0.879	0.02	2.40	1.08-5.34

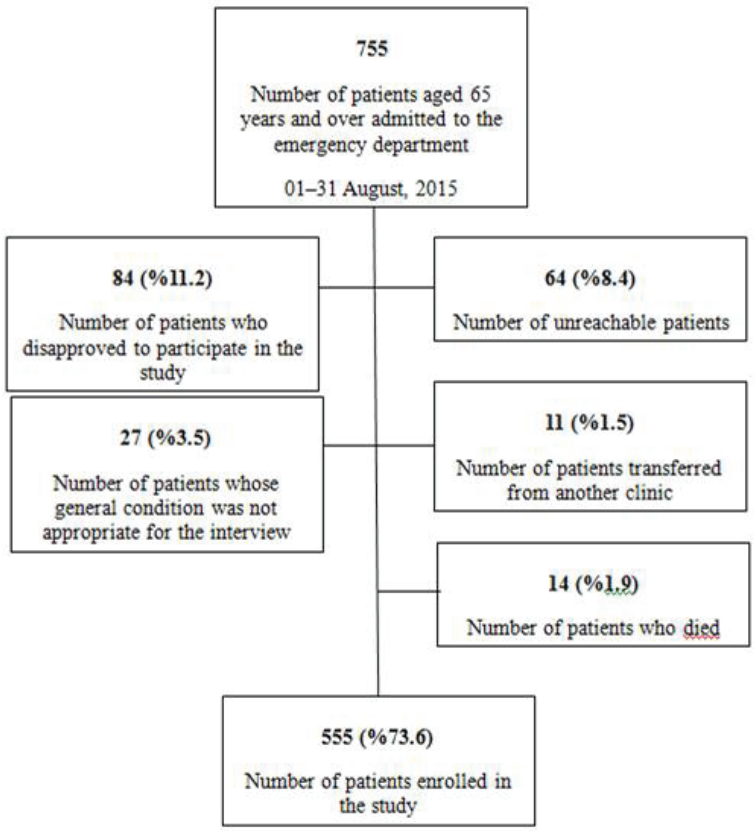
Table 4. The variables associated with fear of falling by the logistic regression model.

Variable	Beta	p	OR	95% CI
Gender (Female)	0.427	0.03	1.53	1.02-2.29
Marital status (Married)	0.663	0.02	1.94	1.07-3.49
Falling status (Yes)	0.780	<0.01	2.18	1.27-3.73
Ability to perform ADL	1.558	0.02	4.74	1.12-20.12
Ability to perform IADL	1.623	<0.01	5.06	2.00-12.82

DISCUSSION

This study evaluated the falls and the FOF in geriatric patients admitted to the ED. Out of 555 patients enrolled in the study, 12.6% were admitted because of falls. Admission to ED with falls was 20% in the study by Carpenter et al., 14% in the study by Young in Australia (7, 8). Faul et al. have shown that 17% of the emergency medical service calls were because of falls (9). Özşaker et al. have reported that 36% of the elderly patients admitted to ED in last 5 years were with history of falls (10). Our results are in concordance with those studies. This study determined that living in a nursing home, and the FOF was associated with falls. According to WHO 2007 report, geriatric people living in nursing homes fall more frequently, with 40% of them falling again every year (4). Kerem et al. stated that there were more falls among those living in nursing homes (11). Tuncay et al. found a significant relationship between the risk of falling and the FOF (6). These findings are compatible with the results of our study. Various studies have also shown that previous falls are a significant risk factor for future falls (12-14). In parallel with these studies, we observed that admittance to the ED due to falling within past year increased the risk of falling. Female sex, having walking as well as balance problems, muscle weakness, and low level of education are also described as risk factors for falls (3, 15, 16). However, in the present study, there was no significant difference between the number of patients admitted for falls and for other reasons in terms of their functional status,

Figure 1. The chart on how the sample of the study was enrolled.



sex, balance and walking problems in past year, the use of walking aids, and education. Geriatric people represent a heterogenous group, and these individuals included in our study may have formed a different group compared with those in the prior studies due to their comorbidities, and education level. Moreover, in the region being serviced by our hospital, there is easy access in terms of healthcare facilities that may have contributed to these results. There was no significant difference between the number of patients admitted due to falls and for other reasons in terms of discharge and hospitalization. Hospitalization rates due to falls, and higher number of admissions due to traumatic falls than medical causes were found to be compatible with the literature (3, 17).

In this study, it was found that female sex, being married, falling status, and the ability to perform ADL and IADL increased the FOF. In agreement with these findings, the FOF was found to be higher among women and patients who have history of falling within the past year (18-20). Greenberg et al. also showed that women were more inclined to express their FOF (18). Besides, according to a WHO report, women fell more often than men, and living alone increases the FOF which differs from our study (4). In the studies by Yörük et al.

and Erdem et al., FOF was more frequent in the widowed and single individuals (19,20). In contrast with these findings, the FOF in our study was higher among married patients which could be due to the higher prevalence of married people in the population included (80.5%). In a study conducted on 146 people aged 50 years and over who were admitted to the ED, it was shown that the perceived risk of falling is related to functional decline and death, independent of sex (18). Yıldırım et al. have found that there is a significant relationship between the FOF and dependency in ADL, and the FOF directly and negatively affects the quality of life (21). Özşaker et al. found that 37% of geriatric patients admitted to the ED limit their activities due to the FOF (10). In a study conducted in Brazil, a significant relationship was found between low FOF and being independent in IADL (22). In this study, it was found that the rates of the FOF are higher among individuals who can perform IADL. It may be hypothesized that people with well-functional state may have developed the FOF because they were more active. Studies researching the relationship between the FOF and IADL among geriatric patients in ED are limited and we were not able to locate such study among Turkish older patients. So, there is need for new studies on this subject. The difference in some of the findings in our study from the literature may have stemmed from short-term nature of the present study.

Limitations of this study were that it was conducted in a period of one month, and in only one university hospital. Thus, it would not be appropriate to make generalizations regarding the results. On the other hand, the higher number of patients comprising this study than those in previous studies in Turkey was the strength of this study.

In conclusion; this study found that living in a nursing home, a history of ED admissions due to falling within past year and FOF were associated with falls. Moreover, female sex, being married, having fallen in past year, and the ability to perform ADL and IADL were associated with FOF. Patients with falls also used ambulances more often, and the use of ED and 112 hotline ambulance services by the geriatric population will gradually increase in parallel with the changes in the structure of the population. We believe that demonstrating the relationship of falls, FOF, functional status, and other factors among geriatric patients admitted to the ED could help with the development and implementation of preventative measures and treatment methods for this vulnerable group and would lead to better care.

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CONFLICT OF INTEREST

None Declared

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RESEARCH

BURDEN OF FAMILY CAREGIVERS OF THE ELDERLY AND FACTORS AFFECTING THEIR BURDEN

Abstract

Introduction: This study aims to analyze the burden of family caregivers of the elderly and the factors affecting their burden.

Materials and Method: This descriptive study was conducted on families providing home care for 270 people above the age of 60 who were registered to the elderly care unit of Yenierenköy Medical Center in Northern Cyprus. The sample consisted of 242 family caregivers who agreed to participate in our study. We used a descriptive questionnaire and the Zarit Burden Interview for data collection. The data were collected between February and May 2017.

Results: Of the participants, 32.2% were between the ages of 31 and 40, 69.8% were female, 79.8% were married, and 30.2% were high school graduates. In addition, 52.5% were the children of the elderly people they cared for and 58.3% had been providing home care for the elderly for six or more years. The income of 60.7% of the participants was insufficient to meet their expenses, 83.5% had one or more children, and 28.2% had chronic illnesses. We found that Zarit Burden Interview scores were higher for caregivers who were below the age of 30, had lower income, and who did not have children or chronic illnesses.

Conclusion: Further qualitative studies must analyze the impact of burden of care on the quality of caregiving for elderly people.

Keywords: Aged; Caregivers; Nursing.

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ARAŞTIRMA

YAŞLI BİREYE BAKIM VEREN AİLE ÜYELERİNİN BAKIM YÜKÜ VE ETKİLEYEN FAKTÖRLER

Öz

Giriş: Bu çalışma; yaşlı bireye bakım veren aile üyelerinin bakım yükü ve etkileyen faktörlerin incelenmesi amacıyla gerçekleştirilmiştir.

Gereç ve Yöntem: Tanımlayıcı tipteki araştırma, Kuzey Kıbrıs'ta Yenierenköy Sağlık Merkezi'ne bağlı yaşlı bakım ekibi tarafından hizmet götürülen 60 yaş ve üzeri 270 yaşlıya evde bakım veren bireyler ile gerçekleştirilmiştir. Örneklemini ise araştırmaya gönüllü katılan 242 bakım veren oluşturmuştur. Veri toplama aracı olarak 'Tanıtıcı Bilgi Formu" ve 'Zarit Bakım Verme Yükü Ölçeği' kullanılmıştır. Veriler Şubat-Mayıs 2017 tarihleri arasında toplanmıştır.

Bulgular: Bakım veren aile üyelerinin %32.2'si 31-40 yaş arası, %69,8'i kadın, %79.8'i evli ve %30.2'si lise mezunudur. Bakım verenlerin %52,5'inin yaşlı bireyin çocuğu olduğu, %58.3'ünün 6 yıl ve üzeri süredir yaşlıya bakım verdiği saptanmıştır. Bakım verenlerin %60.7'sinin gelirlerinin giderlerini karşılamadığı, %83.5'inin çocuk sahibi olduğu ve %28.2'sinin kronik bir hastalığının olduğu belirlenmiştir. Otuz yaş ve altında olan, gelir düzeyi düşük, çocuk sahibi olmayan ve kronik hastalığı olmayan bakım vericilerin bakım yüklerinin yüksek olduğu belirlenmiştir.

Sonuç: Gelecek çalışmaların nitel çalışma deseninde ve hissedilen yükün bakımın kalitesine olan etkisinin incelenmesi yönünde yapılması önerilmektedir.

Anahtar Sözcükler: Yaşlı; Bakım verenler; Hemşirelik.

INTRODUCTION

Advancements in health care services have resulted in increases in life expectancy and proportions of the elderly in populations, in turn, paving the way for new aging-related physical, economic, and psychosocial problems (1). Among these, elderly care is perhaps the most important social problem.

Despite the changes in the social structure of Turkish society, family relations still hold an important place. Besides, family members play an important part in the process of caregiving for dependent elderly people (2). This is not unique to Turkey; families have been primarily responsible for long-term caregiving for the elderly and people with chronic diseases in most societies. However, family members may find it difficult to carry the burden of caregiving owing to various economic, demographic, social, and epidemiologic factors. Therefore, family members who provide caregiving services need to be supported and guided in order to maintain their functions (3).

While care is a basic need for all humans, caregiving is a primary responsibility. Caregiving may be defined as "everything we do directly to help individuals to meet their basic needs, develop or maintain their basic capacities, and live as much as possible free from suffering, so that they can survive and function at least at a minimally decent level" (4).

The concept of care burden refers to the physical, psychosocial, or material problems that may be encountered during the process of caregiving. Care burden is directly related to care needs (5).

Various studies have analyzed the effects of caregiving burden on caregivers of the elderly. Ay et al.'s study found that anxiety and depression levels of caregivers of the elderly were significantly high (5). Kalınkara and Kalaycı found that caregivers experienced 50% burnout, which increased as the maintenance load increased (6). Njoku's study on the effects of caregiving on caregivers' stress levels found that they were faced with not only stress but also depression, anxiety, anger, despair, and hopelessness (7). Similarly, Kim et al.'s study on caregivers of individuals with dementia found that caregiving burden led to depression and deterioration of their physical, emotional, psychological, and functional status (8).

The aims of elderly care include not only treatment but also improving the quality of life by maximizing their physical, mental, and psychological functional capacity, enabling them to be independent and healthy (9). However, the caregiving role may have both positive and negative effects on caregivers. The caregiving experience may provide a new perspective on life and access to social support, contribute to personal development, and improve self-esteem, satisfaction and the relationship between the elderly and their caregivers. However, there are many difficulties caregivers can experience (10).

Increases in the proportions of the elderly among their populations have led various countries to address the need of caregiving for the elderly. Home care for the elderly is among the most important problems. The government of the Turkish Republic of Northern Cyprus (TRNC) provides health and social services for the elderly through public and private nursing homes, rehabilitation centers, and residential homes. Despite these facilities, the responsibility of caregiving for the elderly mostly falls upon family members. If nurses support and encourage family members who carry the burden of caregiving, the quality of care may improve.

Identification of the problems related to caregiving for elderly people is essential to find solutions and improve the quality of elderly care. However, the number of studies defining the problems faced by family caregivers is limited. Factors that may affect the burden of care should be identified in order to determine possible problems and to take the necessary measures. Besides, identification of the burden of caregivers

and taking the necessary steps may empower caregivers and increase their capacity to cope with the side effects of caregiving for elderly people.

This study is an attempt to answer the two questions: "What are the care burden levels of the caregiving families?", and "Is there a relationship between the descriptive characteristics of the caregiving families and their care burden levels?".

MATERIALS AND METHOD

Aim of the study

This descriptive study aims to identify the burden of caregivers of elderly people and the factors affecting their burden.

Population and sample

The population of the study consisted of families providing home care for 270 elderly people above the age of 60 who were registered to the elderly care unit of Yenierenköy Medical Center in the TRNC in 2017. The final sample comprised 242 family caregivers after excluding 15 Greek caregivers who did not know Turkish and 13 caregivers who refused to participate.

Inclusion criteria

Family caregivers who met the following inclusion criteria were included in the study:

- Providing home care to elderly family members who were at least 60
- Had spent at least three months living with the elderly people they cared for
- At least 18 years of age
- Able to communicate with the elderly people they cared for

Data collection tools

Descriptive questionnaire

The questionnaire prepared by the researchers included questions on the caregivers' descriptive characteristics such as gender, age, educational level,the marital status, number of children, income, chronic illnesses, and health status.

Zarit Burden Interview

The Zarit Burden Interview (ZBI), developed to evaluate caregiver burden (11), has 22 items scored on a five-point ordinal Likert-type scale (0: never, 1: rarely, 2: sometimes, 3: frequently, and 4: nearly always). Scores range between 0 and 88, with higher scores indicating higher social and emotional burden experienced by the caregivers. Evaluating the reliability and validity of the Turkish version of the ZBI, İnci and Erdem found a Cronbach's alpha of 0.95. In our study, Cronbach's alpha was 0.914 (12).

Data collection process

The data were collected between February and May 2017 through home visits. Prior to face-to-face interviews with the caregiving family members, we informed the participants about the aim and scope of the study and obtained written informed consent. The data collection process took about 15 minutes per participant.

Statistical analysis

The collected data were analyzed by SPSS version 24.0. In order to determine the hypothesis tests that will be used to compare the findings of the ZBI according to the descriptive characteristics of the caregiving families, we first analyzed the normality of the data distribution by Kolmogorov-Smirnov (significant: .046) and Shapiro-Wilk tests (significant: .001), Q-Q plot, and skewness and kurtosis values. Since the caregivers' ZBI scores did not follow a normal distribution, we used nonparametric hypothesis tests. We used the Mann-Whitney U test for independent variables with two categories and the Kruskal-Wallis (K-W) test for independent variables with more than two categories. In case there were differences between the independent variable categories on the K-W test, the Mann-Whitney U test was conducted to determine the category that caused the difference. $P<0.05$ was considered statistically significant.

Ethical dimensions

We obtained permission from the Scientific Research and Publication Ethics Board (approval number: 2016-3418) and TRNC Ministry of Health General Directorate of Basic Health Services. Informed consent was obtained from all participants. We obtained permission to use the ZBI from the author of the scale via e-mail.

RESULTS

Among the caregivers, 32.2% were between 31 and 40, 69.8% were female, 79.8% were married, and 30.2% were high school graduates. In addition, 52.5% of the participants were children of the elderly people they cared for and 58.3% had been providing home care for the elderly for six or more years. Further, 60.7% of the participants stated that their income was insufficient to meet their expenses, 83.5% had one or more children, and 28.2% had chronic illnesses.

The participants' average ZBI score was 36.92±17.33 and the scores ranged between 2 and 81 (Table 1). Analysis by age group revealed that the care burden of caregivers aged 30 or below was significantly higher than that of other age groups ($p<0.05$) (Table 2). However, we did not find any statistically significant relationship between the ZBI scores of the caregivers and their gender, marital status, educational level, relationship with the elderly, and time spent on elderly care ($p>0.05$). Besides, we found that caregivers whose income was not enough to cover their expenses and who did not have any children had a higher burden of care ($p<0.05$) (Table 2). Finally, the ZBI scores of the caregivers without any chronic illness were significantly higher than those of caregivers with chronic illnesses ($p<0.05$).

DISCUSSION

Studies on the burden of care for elderly people underline the negative effects of caregiving, including psychiatric and psychosomatic problems, stress, depression, and social isolation (13-15). Our study found that family caregivers obtained an average score of 36.92±17.33 on the ZBI, which indicates medium levels of burden (Table 2). Studies on Turkish caregivers of people with chronic illness found that they had low levels of burden (16-17). However, studies conducted on caregivers of elderly people found low to medium levels of burden (18,19). Compared to these, Loureiro et al.'s study found a high prevalence of burden (84.6%) among caregivers of elderly residents in Brazil (14). Similarly, Salama and El-Soud analyzed the burden of care among caregivers of the elderly and found that the majority of caregivers (63.9%) experienced severe burden (20). The difference between the findings of our study and those of others regarding the burden of care may be explained by two factors. Firstly, regular health and social services provided by the elderly care units of the municipalities in the TRNC may have decreased the burden of family caregiving for the elderly population. Secondly, Turkish people may consider elderly care an ethical duty rather than a burden. In order to verify these explanations, we need further studies that analyze the impact of Turkish cultural values on the caregiving role.

ZBI scores differed according to the characteristics of the caregivers. Our study

Table 1. ZBI scores obtained by the caregivers (N=242).

	n	$\overline{X}$	s	Min	Max
ZBI score	242	36.92	17.33	2	81

Table 2. Comparison of ZBI scores of caregiving families according to their descriptive characteristics (n=242).

Variable	n	$\overline{X}$	s	Median	Mean Rank	X^2	p	Difference
Age group								
30 and below	61	45.34	17.39	45.00	154.32	19.180	0.000*	1-2
31-40	78	32.44	15.77	31.50	103.78			1-3
41-49	43	35.56	17.73	35.00	115.91			1-4
50 and above	60	35.18	16.34	33.00	115.18			
Educational level								
No education	37	38.89	16.11	37.00	130.85	7.354	0.118	
Primary	66	31.97	15.05	29.00	101.80			
Secondary	38	39.11	18.04	36.00	129.53			
High School	73	38.90	18.03	38.00	129.39			
University	28	37.89	19.84	39.00	124.11			
Relationship with elderly								
Spouse	44	36.64	16.42	34.50	121.31	4.138	0.247	
Child	127	35.85	17.95	35.00	116.54			
Daughter-in-Law	47	36.66	15.52	35.00	121.43			
Other**	24	43.67	18.53	46.00	148.23			
Time spent on elderly care								
Less than one year	25	37.96	17.89	39.00	127.42	0.262		0.877
1-5 years	76	36.37	18.56	34.00	119.20			
6 years and above	141	37.04	16.65	35.00	121.69			
Gender								
Female	169	34.58	16.50	34.00	122.30		-0.234	0.815
Male	73	42.36	18.09	41.00	120.12			
Marital status							-0.408	0.683
Married	193	35.80	17.13	34.00	123.01			
Single	49	41.37	17.60	41.00	119.28			
Income								
Income matches expenses	95	32.17	17.05	32.00	103.29		-3.254	0.001*
Income does not match expenses	147	40.00	16.87	37.00	133.27			
Having a child								
Yes	202	35.56	17.05	34.00	115.98		-2.757	0.006*
No	40	43.80	17.34	43.50	149.38			
Having a chronic illness								
Yes	92	32.22	15.27	30.50	103.08		-3.206	0.001*
No	150	39.81	17.93	39.00	132.80			

*p<0.05 ** Aunt, uncle etc.

found that ZBI scores of participants below the age of 30 were significantly higher than those of participants from other age groups. Against our findings, Öksüz et al.'s study on caregivers of chemotherapy patients found that ZBI scores did not vary according to age groups (21). However, Salama ve El-Soud found that older caregivers had a higher perception of burden (20). Contrary to the literature, we found that perceived burden was higher for younger caregivers. This finding may be related to the tensions between the expectations of the younger caregivers and the difficulties of caregiving, lack of knowledge and information, and the conflict between the burden of working and caregiving. Besides, limitations in the social life of younger caregivers and their social isolation may have led to a higher perception of burden.

The literature suggests that educational status is an important factor that determines the perceived burden of care. Orak and Sezgin found that caregivers with lower educational status faced problems while receiving help from health professionals regarding caregiving (22). Salama and El-Soud's study found that burden of care decreased parallel to the decrease in caregivers' educational status (20) Contrary to this, Loureiro et al.'s study in Brazil found that burden of care was higher for caregivers with lower educational status (14). However, our study did not find any association between the educational status of caregiving families and burden of care ($p>0.05$) (Table 2). Similarly, various studies on Turkish caregiving families found no association between caregivers' educational status and their perceived burden of care for the elderly (17, 22, 23).

Various international studies found that insufficient financial resources are among the key factors that affect burden of care for elderly people (14, 24). Our study found that burden of care was higher for the caregivers whose income did not match their expenses. In a similar vein, Yeşil, Uslusoy and Korkmaz's study on caregivers of patients with chronic illness found a negative relationship between burden of care and income status (23). Two further studies conducted in Egypt and Pakistan found that caregivers' insufficient financial resources are inversely related with their perceived burden of care (20,24). Caregivers with lower income may face difficulties in meeting the costs of family caregiving or may not be able to access financial resources. This, in turn, increases the perceived burden of care and stress among caregivers.

Our study found that family caregivers without children had higher ZBI scores ($p<0.05$) (Table 2). Similarly, Özdemir, Şahin and Küçük's study found a statistically significant relationship between the number of children a caregiver had and the burden of care (25). Having a child may be considered a means of socialization. Therefore, caregivers of elderly people who do not have a child may perceive themselves as isolated. Besides, caregivers who prioritize providing care for elderly people may neglect their personal lives. This, in turn, may result in a perception of burden of care.

In our study, 71.8% of the caregiving families did not have any chronic illness. We found that ZBI scores were higher for caregivers without chronic illnesses ($p<0.05$). However, two studies on the burden of caregivers in Turkey found that caregivers with health problems experienced a higher burden of care (17). This difference may be explained with reference to the possibility that caregivers without health problems may feel insufficiently equipped to cope with illness owing to a lack of personal experience. On the contrary, caregivers with chronic illness may be more experienced to cope with not only their problems but also those of the elderly. However, further studies with a higher number of participants should be conducted in order to verify our explanation and make a substantial contribution to the literature.

Based on our findings, we can conclude that the analysis of factors that influence the burden of caregiving and personalized support provided to caregivers may reduce the burden of care on

caregivers of elderly people. Sociodemographic and economic characteristics of caregivers may have an important effect on the management of care provided to elderly people. We suggest the requirement of the development of new policies and guidance services that target younger caregivers and those with lower income. Finally, further studies must analyze the impact of burden of care on the quality of caregiving.

CONFLICT OF INTEREST

The authors declare no conflict of interest related to this study.

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RESEARCH

ASSESSMENT OF THE IMPACT OF DEMENTIA CARE AND SUPPORT PROGRAM IN BOTH PATIENT AND CAREGIVER OUTCOMES: AN INTERVENTION STUDY

Abstract

Introduction: Dementia is one of the priority issues among the public health concerns. This study aims to assess the impact of the Dementia Care and Support Program in caregivers and patients with dementia.

Materials and Methods: This study is an intervention study. Dementia Care and Support Program was a planned 16-week program. Sixty-one patient–caregiver pairs were randomized into two groups, the intervention (n=31) and control groups (n=30). Dementia Care and Support Program was applied to the intervention group, but the control group received routine hospital care. Data were collected between July and November 2016 from a dementia outpatient clinic. While data for patients were collected using the quality-of-life assessment in Alzheimer's disease and Neuropsychiatric Inventory, data for caregivers were collected using the quality of life SF-36, Beck Depression, Beck Anxiety, and Zarit Caregiver Burden Care Inventory.

Results: Fifty-four patient–caregiver pairs completed the study. The mean age of the patients was 76.7±11.2 (46–96) years old. There was no statistically significant difference in the quality-of-life scores and neuropsychiatric symptom scores between the patient groups ($p>0.05$). The mean age of caregivers was 53.6±14.8 (22–81) years old. Statistically significant differences were found in NPI-D, quality-of-life mental health, quality-of-life physical health, depression, and anxiety scores between the caregiver groups ($p<0.05$), but there was no statistically significant difference in burden scores ($p>0.05$).

Conclusion: This study established that Dementia Care and Support Program has positive effects on caregivers.

Keywords: Dementia; Patient; Caregiver; Quality of Life; Depression.

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ARAŞTIRMA

DEMANS BAKIM VE DESTEK PROGRAMININ HASTA VE BAKIM VERİCİ ÇIKTILARI ÜZERİNDEKİ ETKİSİNİN DEĞERLENDİRİLMESİ: BİR MÜDAHALE ÇALIŞMASI

Öz

Giriş: Demans halk sağlığı sorunları arasında öncelikli bir konudur. Bu çalışmanın amacı demanslı hastaların bakım vericilerine uygulanan Demans Bakım ve Destek Programı'nın etkisini değerlendirmekti.

Gereç ve Yöntem: Bu çalışma 16 haftalık bir müdahale çalışmasıdır. Çalışmada 61 hasta-bakım verici çifti iki gruba randomize edildi. Girişim grubu 31, kontrol grubu 30 kişiden oluştu. Girişim grubuna Demans Bakım ve Destek Programı uygulanırken, kontrol grubuna rutin hastane bakımı verildi. Veriler Demans polikliniğinde 2016 Temmuz-2016 Kasım tarihleri arsında toplandı. Veri toplamada hastalar için Alzheimer Hastalığı Yaşam Kalitesi Ölçeği ve Nöropsikiyatrik Envanter kullanılırken; bakım vericiler için Yaşam Kalitesi SF 36 Ölçeği, Beck Depresyon Ölçeği, Beck Anksiyete Ölçeği, Zarit Bakım Yükü Ölçeği kullanıldı.

Bulgular: Çalışma 54 bakım verici-hasta çifti ile sonlandırıldı. Hastaların yaş ortalaması 76.7±11.2 (46-96) idi. Hastaların yaşam kalitesi puanlarında ve nöropsikiyatrik semptom ciddiyeti (NPI-S) puanlarında gruplar arasında istatistiksel olarak anlamlı bir fark bulunmadı ($p>0.05$). Bakım vericilerin yaş ortalaması ise 53.6±14.8 (22-81) idi. Bakım vericilerin distress (NPI-D) puanlarında, yaşam kalitesi puanlarında, depresyon ve anksiyete puanlarında gruplar arasında istatistiksel olarak anlamlı fark bulundu ($p<0.05$). Fakat, bakım verici yükünde gruplar arasında istatistiksel olarak anlamlı bir fark bulunmadı ($p> 0.05$).

Sonuç: Bu çalışma, Demans Bakım ve Destek Programı'nın demans hastalarının bakım vericileri üzerinde olumlu etkisi olduğunu ortaya koymaktadır.

Anahtar Sözcükler: Demans; Hasta; Bakım Verici; Yaşam Kalitesi; Depresyon.

INTRODUCTION

Dementia is a rapidly growing global public health problem. Approximately 50 million people have dementia worldwide, and most of them live in low- and middle-income countries. Nearly 10 million new cases are discovered annually (1). Dementia rises exponentially during old age; it is one of the leading causes of disability and dependency among the elderly (2). Dementia is often seriously devastating for both patient and caregiver or family. Family caregivers who are informal caregivers experience burden, depression, anxiety, health-related problems, and financial difficulties (1,2).

Dementia care aims to preserve patients' functioning, decrease disability, regulate the environment and relationships to sustain stability, and maintain personality and quality of life (3). Nurses are accountable for providing education, information, and support to caregivers during all stages, which is the first and fundamental step among the non-pharmacological approaches (3, 4). Based on evidences, public health nursing practices in dementia care aim to maintain quality results despite differences in patient care outcomes, standardized care, and enhanced nurse satisfaction (5).

The program used in this research was Dementia Care and Support Program (DCSP), which was developed by the authors from the literature review (6, 7). This was a multicomponent psychosocial intervention. The psychosocial intervention for family and/or informal caregiver attempts to increase knowledge (education), improve skills and coping strategies, and provide support (7). In the recent years, several authors have assessed the efficacy of interventions for both caregivers and dementia patient, but they have found considerable variability in the outcome. The DCSP consists of both individual (telephone interviews and home visits) and group support intervention (group training, face-to-face group meeting, WhatsApp group interviews). When the literature was examined, only two nursing researches (8, 9) were found in Turkey. This situation has increased the interest in conducting research about the subject. This study aims to provide evidence for the impact of multicomponent and multidisciplinary interventions on both patient and caregiver outcomes.

MATERIALS AND METHOD

Study design

This study is intervention study.

Participants

This study was conducted at Manisa Celal Bayar University (MCBU) Hafsa Sultan Hospital Dementia Outpatient Clinic in Manisa, between July and November 2016. The study universe comprised clinic-registered patients (N = 396) and their caregivers (family caregivers). We computed the sample size with power analysis, statistically based on the work of Martin-Corasso et al. (10). The power analysis for this study, at 99% power and 0.01 error level, was therefore determined that 38 patient–caregiver pairs (19 patient–caregiver pairs in each group) were required. Considering loss of subjects over time, we initiated the study with 61 patient–caregiver pairs. The study sample was selected by probabilistic sampling among patient–caregiver pairs that fulfilled the inclusion criteria.

The inclusion criteria for patients were as follows: clinical diagnosis of dementia; living in Manisa; not leaving Manisa during the study period and willing to participate in the research. The exclusion criterion was diagnosis with cancer. We enrolled caregivers based on the following criteria: aged ≥18 years; living in Manisa; not leaving Manisa during the study period and willing to participate in the research.

Randomisation criteria were dementia type, dementia stage and caregivers' education level. We stratified the patients and caregivers based on the education status of caregivers, considering

the randomisation criteria. Using simple random placement method, we determined groups of caregivers to be assigned to the groups. The patient–caregiver pairs were assigned to the randomised IG (n = 30) and CG (n = 31). We evaluated the homogeneity of randomisation using the x^2 test. Figure 1 shows the study flowchart.

Procedures

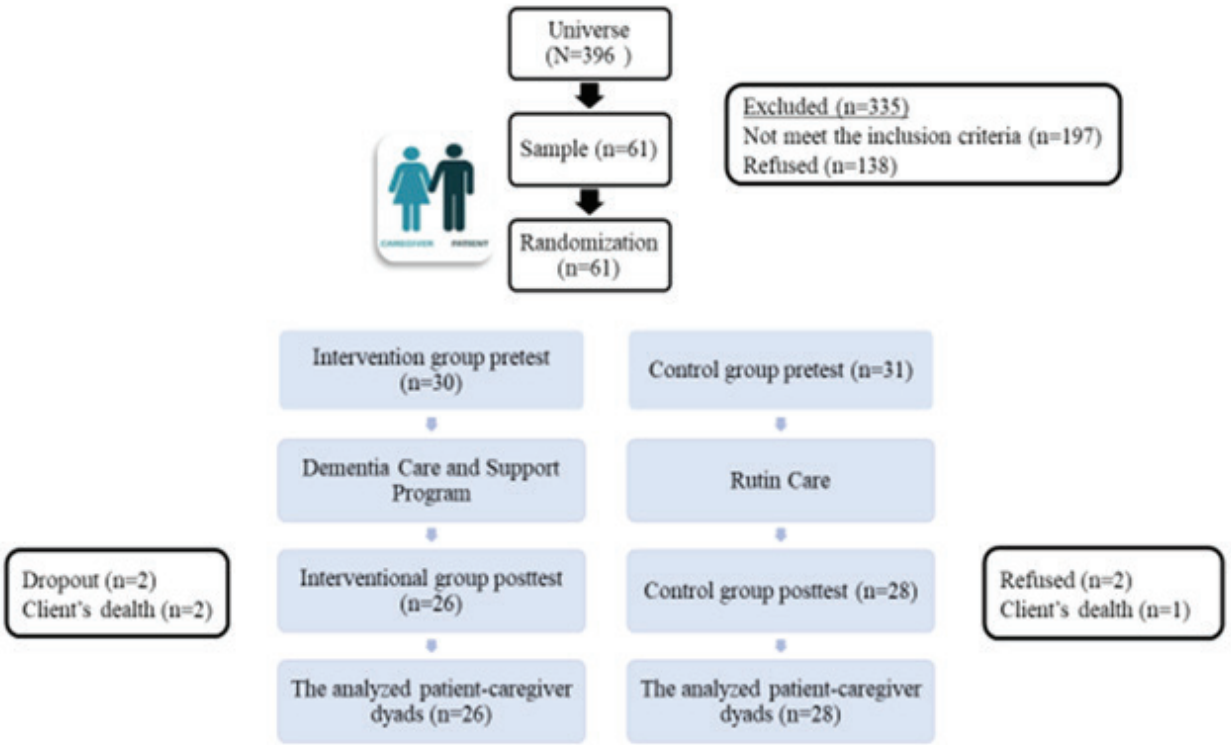
The programme with multi-component interventions was given by a multi-disciplinary team (nurse, neurologist, psychologist). Dementia type and its stages were diagnosed by a neurologist.

Intervention group

The group received group training and support, home visits and individual support through telephonic interviews. Caregivers were unable to attend group training when they could not find anyone to leave their patients. This handicap was tried to be overcome with the WhatsApp group and house visits. WhatsApp group was set up to make caregivers communicate and interact with each other and researchers. During 16 weeks, caregivers were interviewed routinely per month; four face-to-face interviews were conducted with each patient–caregiver dyad.

After pre-test, intervention group was trained with a structured standard training package

Figure 1. Flowchart of the Research.



(Fig. 2); the training comprised videos, oral presentation, question–answer sessions. Training programme created by the researchers and the study plan were explained to the caregivers in writing. In some training sessions, psychologist at the dementia clinic played a supporting role (stress management and problem-solving methods). Furthermore, caregivers provided support for individual problems.

Control group

We interviewed the CG (n = 31) two times during the data collection process. The group received just routine hospital care. At the end of 16 weeks, the programme was provided to this group too.

Data collection

Caregiver and Patient Information Form: The form prepared by referring to the literature (10, 11). was comprised of two sections. Firstly section was about patients' age, sex, education level, marital status, dementia type and stage, comorbidity etc. Secondly section was about caregivers' age, sex, education level, marital status, income status, relationship with patients etc.

Patients Quality-of-life in Alzheimer's Disease (QoL-AD): The scale developed by Longsdon et al. (1999) was filled and assessed separately for patients and caregivers. The scale measures quality of life of Alzheimer's patients. The scale comprises 13 items of the Likert type, and quality of life increases as the score increases. Akpınar &Küçükgüçlü (2012) assessed the Turkish reliability and validity of the and Cronbach's α to be 0.84 (12). In this study, Cronbach's α was 0.84.

Neuropsychiatric Inventory (NPI): This assesses the frequency and severity of psychological and behavioural symptoms of dementia and is based on interviews with caregivers. It comprises two parts as follows: (a) measures the severity of associated problem behaviours on a scale of 1–3 (NPI-S) and (b) measures the perceived distress of problem behaviours by caregivers on a scale of 0–5 (NPI-D). Akça-Kalem et al. (2005) evaluated Cronbach's $\alpha$of the inventory to be 0.79. For specific items of the frequency and severity, Cronbach's α varies between 0.76 and 0.79, respectively (13). In this study, Cronbach's α of the inventory was 0.91, and for specific items of the frequency and severity Cronbach's α values were 0.73 and 0.77.

Caregivers

Quality of Life Scale SF36 comprises eight sub-dimensions and defines two summary areas: mental health and physical health. The total score can be 0–100. Koçyiğit et al. (1999) assessed the Turkish reliability and validity of the scale. Cronbach's α of the scale was 0.73–0.76 for sub-dimensions of the scale (14); in this study, it was 0.73–0.88.

The Beck Depression Inventory (BDI) was developed by Beck et al. (1961) and enables the assessment of both depressive symptoms and cognitive content. The total score can be 0–63 points. Hisli (1989) assessed the Turkish validity and reliability. The total score can be 0–63 points. Cronbach's α was 0.80 (15); in this study, it was 0.80.

Beck Anxiety Inventory (BAI) is a 21-item Likert-type scale, developed by Beck et al. (1988), to determine the frequency of anxiety symptoms of individuals. The severity of anxiety increases as the total score of the scale increases. The total score can be 0–63 points. Ulusoy (1998) established the Turkish validity and reliability of the scale. Cronbach's α of the scale was 0.93 (16); in this study, it was 0.87.

Zarit Burden Interview (ZBI) the most widely used in caregiver burden. It encompasses the physical, emotional and financial burden as perceived by the caregiver. It asks 22 questions that are rated on a five-point scale (0 = not at all to 4 = nearly always). Cronbach's α for the validity luck study of the scale was 0.95 (17); in this study, it was 0.91.

Statistical analysis

Statistical analyses were performed using

the SPSS 15.0 software package. We evaluated descriptive characteristics using numbers and percentages and binary comparisons using the x^2 test. We considered the statistical significance at 0.05. Data of the normal distribution are presented by the number of sample size and Shapiro–Wilk values. Furthermore, non-parametric tests were used to analyse non-normally distributed variables.

Ethics

The study was approved by the MCBU Medicine Faculty Local Ethics Board (dated 9 December 2015; No: 20478486-412), MCBU Hafsa Sultan Hospital. We obtained written informed consent from all caregivers and some of the patients through the Volunteer Form.

RESULTS

We assessed the research findings in two parts – patients' and caregivers' results.

Patients' results

The mean age of the patients was 76.7 ± 11.2 (46–96) years old. We observed no statistically significant differences between the groups for all demographic characteristics ($p > 0.05$), except for marital status ($p < 0.05$; Table 1).

Table 1. Socio-demographic and descriptive characteristics of patients (n = 61)

Variable		Intervention Group (n = 30)	Control Group (n = 31)	X^2 test*
		n (%)	n (%)	X^2, p
Age	≤76 years	9 (40.9)	13 (59.1)	x^2 = 0.942 p = 0.332
	>76 years	21 (53.8)	18 (46.2)	
Sex	Female	23 (52.3)	21 (47.7)	x^2 = 0.604 p = 0.437
	Male	7 (41.2)	10 (58.8)	
Education Level	Illiterate	8 (66.7)	4 (33.3)	x^2 = 8.019 p = 0.155
	Literate	3 (25.0)	9 (75.0)	
	Primary School	15 (62.5)	9 (37.5)	
	Middle School	1 (25.0)	3 (75.0)	
	High School	2 (40.0)	3 (60.0)	
	University	1 (25.0)	3 (75.0)	
Marital Status	Married	10 (30.3)	23 (69.7)	x^2 = 10.250 p = 0.001
	Single	20 (71.4)	8 (28.6)	

Variable		Intervention Group (n = 30)	Control Group (n = 31)	X^2 test*
		n (%)	n (%)	X^2,p
Dementi Type[a]	Alzheimer's Disease	23 (46.0)	27 (54.0)	x^2 = 2.104 p = 0.717
	Typea	1 (50.0)	1 (50.0)	
	Dementia with Lewy Bodies	1 (50.0)	1 (50.0)	
	Mixed Dementia	1 (50.0)	1 (50.0)	
	Parkinson's Disease Dementia	4 (80.0)	1 (80.0)	
Dementia Stage[a]	Very Mild (0.5)	2 (50.0)	2 (50.0)	x^2 = 3.710 p = 0.295
	Dementia Stagea	11 (47.8)	12 (52.2)	
	Moderate (2)	12 (66.7)	6 (33.3)	
	Severe (3)	5 (33.3)	10 (66.7)	
Comorbidity	Yes	21 (47.7)	23 (52.3)	x^2 = 0.133 P = 0.715
	Comorbidity	9 (52.9)	8 (47.1)	

Abbereviations: *x^2 test; a Randomisation criteria.

There was no statistically significant difference in quality-of-life scores and neuropsychiatric symptom scores between the groups (p > 0.05; Table 2).

Caregivers' results

The mean age of caregivers was 53.6 ± 14.8 (22–81) years old. No significant differences were observed between the groups for all demographic characteristics (p > 0.05; Table 3).

The results of the present study demonstrate that there was statistically significant differences in NPI-D, quality-of-life (both mental and physical health), depression, and anxiety scores between the groups (p < 0.05), but there was no statistically significant difference in burden scores (p > 0.05; Table 4).

DISCUSSION

Caregivers have critical roles, needs, and difficulties; however, inadequate information about the care provided by the caregivers increases problems for patients as well as caregivers. With the use of structured sessions and information and psychological support investigation, one of the hopes of the 16-week intervention program was to determine whether intervention could affect the outcomes for both caregivers and dementia patients.

Table 2. Dependent variable scores at pre-test–post-test measures of patients with dementia (n = 61).

		Intervention Group		Control Group		Between groups**
		n	x ± SD (Min; Max)	n	x ± SD (Min; Max)	
QoL-ADa	Pre-test	22	31.18 ± 6.14 (22; 42)	20	33.29 ± 4.96 (22; 44)	z = −2.054; p = 0.400
	Post-test	17	31.79 ± 5.41 (22;39)	17	32.39 ± 4.33 (22; 39)	z = −0.328; p = 0.743
NPI-S	Pre-test	30	31.18 ± 23.79 (0; 87)	31	19.41 ± 16.09 (0; 52)	z = −0.845; p = 0.398
	Post-test	26	26.50 ± 21.99 (0; 77)	28	30.70 ± 23.78 (8; 88)	z = −1.013; p = 0.311

Abbereviations: *Mann–Whitney U-test.; **Wilcoxon marked rank test.; a Calculated solely for Alzheimer's disease; QoL-AD, Quality of life in Alzheimer's Disease; NPI-S, Neuropsychiatric Inventory –Severity.

Table 3. Socio-demographic and descriptive characteristics of caregivers (n = 61).

Variable		Intervention Group (n = 30)	Control Group (n = 31)	X^2 test*
		n (%)	n (%)	X^2,p
Age	?53 years	18 (58.1)	13 (41.9)	x^2 = 1.991; p = 0.158
	>53 years	12 (40.0)	18 (60.0)	
Gender	Female	25 (52.1)	23 (47.9)	x^2 = 0.759; p = 0.384
	Male	5 (38.5)	8 (61.5)	
Education Level	Illiterate	-(-)	1 (100.0)	x^2 = 0.984; p = 0.964
	Literate	2 (50.0)	2 (50.0)	
	Primary School	10 (50.0)	10 (50.0)	
	Middle School	3 (50.0)	3 (50.0)	
	High School	9 (50.0)	9 (50.0)	
	University	6 (50.0)	6 (50.0)	
Marital Status	Married	23 (50.0)	23 (50.0)	x^2 = 0.050; p = 0.823
	Single	7 (46.7)	8 (53.3)	
Income Status	Low Income	4 (30.8)	9 (69.2)	x^2 = 2.689; p = 0.261
	Middle Income	24 (55.8)	19 (44.2)	
	High Income	2 (40.0)	3 (60.0)	

Variable		Intervention Group (n = 30)	Control Group (n = 31)	X^2 test*
		n (%)	n (%)	X^2, p
Relationship with Patients	Spouse	4 (25.0)	12 (75.0)	x^2 = 10.211; p = 0.069
	Child	19 (63.3)	11 (36.7)	
	Daughter-in-law	6 (54.5)	5 (45.5)	
	Sibling	1 (100.0)	-(-)	
	Parents	-(-)	1 (100.0)	
	Other	-(-)	2 (100.0)	

Abbereviations: *x^2 test; a Randomisation criteria.

Table 4. Dependent variable scores at pre-test–post-test measures of caregivers (n = 61).

		Intervention Group		Control Group		Between groups**
		n	x ± SD (Min; Max)	n	x ± SD (Min; Max)	
SF 36 (physical health)	Pre-test	30	41.75 ± 10.00 (26; 52)	31	41.59 ± 9.78 (25; 61)	z = 0.447; p = 0.655
	Post-test	26	45.41 ± 7.94 (30; 57)	28	37.74 ± 10.77 (22; 55)	z = 2.372; p = 0.018
SF36 (mental health)	Pre-test	30	41.79 ± 9.024 (17; 55)	31	42.18 ± 10.52 (24; 57)	z = 0.0.736; p = 0.462
	Post-test	26	44.87 ± 8.94 (21; 60)	28	39.47 ± 9.39 (27; 57)	z = 2.701; p = 0.007
BDI	Pre-test	30	11.62 ± 8.34 (1; 35)	31	15.23 ± 7.70 (3; 26)	z = 1.525; p = 0.127
	Post-test	26	9.68 ± 8.45 (0; 35)	28	20.64 ± 8.94 (5; 39)	z = 3.268; p = 0.001
BAI	Pre-test	30	10.06 ± 8.89 (0; 30)	31	12.23 ± 8.05 (1; 30)	z = 0.043; p = 0.965
	Post-test	26	6.18 ± 7.26 (0; 29)	28	15.47 ± 9.28 (1; 34)	z = 2.636; p = 0.008
NPI-D	Pre-test	30	11.87 ± 9.73 (0; 32)	31	9.35 ± 8.06 (0; 27)	z = −0.296; p = 0.767
	Post-test	26	10.50 ± 8.70 (0; 27)	28	14.64 ± 10.06 (3; 38)	z = −1.968; p = 0.049
ZBI	Pre-test	30	31.43 ± 18.18 (5; 74)	31	40.17 ± 18.10 (13; 65)	z = 0.599; p = 0.549
		26	27.87 ± 18.39 (5; 63)	28	40.70 ± 17.66 (10; 70)	z = 1.351; p = 0.177

Abbreviations: *Mann–Whitney U-test; **Wilcoxon marked rank test, SF 36, Quality of Life Scale SF36; BDI, Beck Depression Inventory; BAI, Beck Anxiety Inventory; NPI-D, Neuropsychiatric Inventory-Distress, ZBI; Zarit Burden Interview..

Figure 2. The Dementia Care and Support Programme's structured standard training package.

Session	Duration	Theme
Session 1	30 min.	Obtaining information about the patient and the relatives responsible for the care
Session 2	40 min.	What isdementia?
Session 3	30 min.	Dementia treatment (pharmacologic and on-pharmacological treatments)
Session 4	40 min.	Dementia patient care (nutrition, communication, incontinence, sleep, pressure scar…
Session 5	30 min.	Importance of family support in the treatment and care of the patient
Session 6	30 min.	Problem solving methods
Session 7	30 min.	Share experience of stress with patients
Session 8	30 min.	Importance of communication in the recovery of patients

Patients

The quality of life is an essential parameter in terms of the progression of dementia. Thus, quality-of-life assessment is imperative in planning the care given to the patients. In this study, there was no statistically significant difference in the quality of life between the groups. In the literature, studies on the quality of life of dementia patients are limited. Soylemez et al. conducted an intervention study with a 6-month period while Koivisto et al. made a 3-year follow-up (8, 18). In both studies, no statistically significant difference between the groups in the quality of life (8, 18) was observed. Our findings on the quality of life may be due to the patients' lack of insight and cognitive deficits.

In our study, the intervention provided no beneficial effects on patients' NPI-S score. An 18-month follow-up study provided beneficial results on NPI (11). Our findings are consistent studies both with short intervention period (8, 19) and with long intervention period (18). The findings of some studies and our study (8, 18) supported the idea that neuropsychiatric problems are associated with lower quality of life in patients.

Caregivers

We observed a marked difference between the groups in the post-test on both areas of the caregivers' quality-of-life scores. These findings are consistent with some studies when the psychosocial intervention was applied (10, 11). This finding reinforces that modifying the intervention according to the caregiver's needs may result to a successful outcome.

Reportedly, caregivers of patients with dementia are hidden victims who experience mental and physical health-related problems that hinder their ability to cope with stress effectively (20). In this study, the DCSP has a positive effect on depression in the intervention group. This finding is consistent with the study of Kuo et al. (21) while not consistent with the study of Söylemez et al. (8). Our positive findings may have been due to the efficacy of the multicomponent intervention (group training and support, home visits, and individual support through telephone interviews).

This study shows that psychosocial interventions may also decrease the anxiety of caregivers. Akkerman and Ostwald reported that caregivers exhibited a considerable reduction in anxiety scores (22). Santos et al. emphasized the impact of participating in psychosocial interviews, support groups, and education in decreasing the adverse impact of caregiving (23). This result may have been due to the efficacy of having

an individual consultant and support through telephone interviews. Outside of the initiative program, caregivers were able to reach out to the researcher when they needed it.

In this study, significant difference was observed between the groups' NPI-D post-test scores. Reportedly, neuropsychiatric problems are associated with depression symptoms and caregivers' burden (23). Consistent with Dias's findings, the psychosocial intervention positively affected the caregiver distress (19). Our results suggest that providing education and counseling to caregivers decrease their distress.

Upon evaluating the caregivers' burden scores, we did not observe a marked difference between the groups. These findings were consistent with the findings of some previous studies (23, 24). Martin-Corasso et al. continued intervention for 10 months and showed better burden results (10). Caregiver burden encompasses the physical and psychological well-being, social life, and financial status. In this study, it was thought that this resulted to caregivers' physical and psychological well-being and social life positive progress. However, the lack of intervention in the financial dimension of the burden of care in the study may be the reason for no difference between the groups.

The factor that differentiates this research from other studies in the literature and provides a positive effect on many aspects of the research may be related to the fact that the program applied to caregivers is supported not only by the group trainings given in the hospital but also by the home visits and telephone conversations provided outside of the clinical setting as well as by having a multidisciplinary team.

This study has several limitations. First, no scale was used to determine the patient's quality of life for the different types of dementia, and data were collected by the scale used only on patients with Alzheimer's disease. Second, the study duration and recurrence measurements were limited. There could be an improvement in most outcomes as the post-test was performed immediately after the 16-week trial. Thus, had the study period been extended, the results could have been different. Finally, some caregivers could not attend the group training because they could not leave their patients alone at home. This resulted in higher home visits and telephone interactions than planned; this intervention also limited the interaction of caregivers with each other.

In conclusion; this study reveals that multicomponent and multidisciplinary interventions, education, and counseling programs have positive impact on caregivers' distress, quality of life, depression, and anxiety. We think that the results of the patients' quality of life and neuropsychiatric symptom severity are clinically but not statistically significant. This is a positive development for a disease without cure. In addition, regular home visits could potentially improve patients' and caregivers' outcomes. Thus, this study recommends using the program for nurses working with dementia patients and their caregivers. Regular and interdisciplinary training and counseling programs should be organized for caregivers, and their efficacy should be assessed. Furthermore, this study highlights the need to add dementia care education to the curriculum for nurses, based on the application of the program to home healthcare providers. Overall, the use of this program for regular home visits by nurses working in primary care units is recommended.

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RESEARCH

ATTITUDES OF PROFESSIONALS IN NURSING HOMES AND SOCIAL SERVICE CENTERS TO THE ELDERLY: THE ANKARA EXAMPLE

Abstract

Introduction: Positive or negative attitudes on the part of people working in the domain of elderly care are especially influential with regard to the benefits offered by the social services to the elderly. In this context, the attitudes of professionals in nursing homes, social service centers, and in the elderly care and rehabilitation centers are examined in this paper, which used the city of Ankara for its sample.

Materials and Method: The descriptive research model was utilized for this study. 100 professionals in Ankara were reached. Interview form prepared by researchers and Kogan's Attitudes Toward Older People Scale were used as the data collection tool. Number, mean, percentage frequency distribution, correlation, t-test, ANOVA, and Pearson correlation were used in the analysis of the data.

Results: The mean score of attitudes of professionals toward the elderly was calculated as 133,16 (sd=20.16). A statistically significant difference was found in the attitude scores toward the elderly between those professionals who had earned a graduate degree and those who lived with a dependent family member.

Conclusion: The results of the field research revealed that sociologists, social workers, and psychologists expressed a more positive attitude toward the elderly. The study also found that caring for a dependent family member and the duration of work negatively affected the attitudes of professionals toward their aging clientele.

Keywords: Aged; Attitude; Social work; Social workers.

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ARAŞTIRMA

HUZUREVİ VE SOSYAL HİZMET MERKEZLERİNDE ÇALIŞAN MESLEK ELEMANLARININ YAŞLILARA YÖNELİK TUTUMLARI: ANKARA ÖRNEĞİ

Öz

Giriş: Yaşlılık alanında çalışanların yaşlılara yönelik olumlu ya da olumsuz tutumları yaşlıların sosyal hizmetlerden yararlanma süreçlerine etki etmektedir. Bu bağlamda bu çalışmada sosyal hizmet merkezleri ile huzurevi ve yaşlı bakım ve rehabilitasyon merkezlerinde çalışan meslek elemanlarının yaşlılara yönelik tutumları Ankara örnekleminde incelenmiştir.

Gereç ve Yöntem: Araştırmada betimleyici araştırma modeli kullanılmıştır. Araştırma kapsamında Ankara'da 100 meslek elemanına ulaşılmıştır. Veri toplama aracı olarak araştırmacılar tarafından oluşturulan Görüşme Formu ile Kogan Yaşlılara Karşı Tutum Ölçeği kullanılmıştır. Verilerin analizinde sayı, ortalama, yüzde frekans dağılımı, korelasyon, t testi, ANOVA ve Pearson korelasyon kullanılmıştır.

Bulgular: Meslek elemanlarının yaşlılara yönelik tutum puan ortalamaları 133.16 (sd=20.16) olarak hesaplanmıştır. Mezun olunan bölüm ve ailede bakmakla yükümlü olunan birinin varlığı ile yaşlılara yönelik tutum puanları arasında istatistiksel olarak anlamlı bir farklılık olduğu görülmüştür.

Sonuç: Araştırmada sosyolog, sosyal hizmet uzmanı ve psikologların yaşlılara yönelik daha fazla olumlu tutum puanına sahip oldukları görülmüştür. Katılımcıların bakmakla yükümlü olduğu bir yakınının olması ve meslek elemanı olarak çalışma sürelerinin yaşlılara yönelik tutumları olumsuz yönde etkilediği sonucuna ulaşılmıştır.

Anahtar Sözcükler: Yaşlı; Tutum; Sosyal hizmet; Sosyal çalışmacı.

INTRODUCTION

Aging is the process of psychological and social change which is also accompanied by biological transformations. Phenomena such as, technological developments, progress in basic health services, prolonged life-spans, decreasing fertility rates (1, 2) have significantly increased the numbers of the elderly in the population of many nations. In 2025, this population segment is expected to reach 1,100 million (3). Turkey is transforming into an aging country in terms of its population structure. According to TUIK data, the ratio of the total number of elderly citizens to the nation's population was 7.7% in 2013 and 8.5% in 2017. It is estimated that this ration will become 10.2% in 2023 (4).

At the same time, negative attitudes and prejudices toward the elderly are being noted in many societies (5,6) because of reasons such as changes in the traditional functions and social status of older people; the general deterioration of social relations because of rapid urbanization; and the elderly population's decrease in productivity, their income inadequacy, health problems, and need for care. This situation has led to the emergence of the concept of "age discrimination". The concept of age discrimination was first used in 1969 by Robert Butler, the Director of the United States' National Institute on Aging (7). Butler defined age discrimination as the systematic stereotyping of and discrimination against people because of their age in a manner similar to prejudices against skin color in racism (8). Age discrimination may also be described as the practice of prejudice, biased action, negative attitude and legal arrangements toward individuals. Some acknowledgments direct the actions and form the basis of age discrimination: the recognition that the elderly are useless, child-like, constantly ill, lonely, asexual, poor, incapable, and not percipient (7). These and similar assumptions based on age discrimination can easily be adopted and can lead to the development of discriminatory and repressive attitudes toward the elderly (7). Attitude includes cognitive, behavioral, and emotional components based on individual behaviors and values (9). Attitudes are often shaped by social values, and may thus vary from culture to culture. Positive attitudes toward the elderly include compassion, wisdom, credibility, political power, freedom, and happiness. Conversely, negative attitudes include perceptions of disease, impotence, ugliness, decline in mental functions, mental illness, uselessness, isolation, poverty, and depression (5).

Interpretations with regard to the conception of the aged and aging have differed through history and across societies. The notion of elderly care emerged from the paternalist point of view along with the concept of the social state. It has acquired a corporate identity within the scope of rights-based social services (10). The services provided by the social welfare regimes to the elderly are shaped within the framework of demographic, economic, social, and humanitarian reasons, and also through the principle of a social state (11). The southern European welfare regime dominates in Turkey. Thus, the services offered to the elderly in need of care and protection are executed largely by the public. The central public institution providing such services in this area is the Ministry of Family, Labor and Social Services, and the municipalities form the local public institutions (10). The service models offered in this area can be classified into residential care services offered by nursing homes and elderly care and rehabilitation centers, home care services, elderly day care services, and elderly service centers (12, 11).

The attitudes of professional practitioners working with individual, family, and community resources for the well-being of the elderly exert a major impact on the quality of the service that is rendered because the negative perceptions and behaviors related to aging can lead to low self-esteem and can disrupt the status of elderly citizens. Beginning with this point, the attitudes of the professionals of nursing homes, social service

centers, and the elderly care and rehabilitation centers operated by the Ministry of Family, Labor and Social Services were determined to be the subject of the present study which was conducted in Ankara.

MATERIALS AND METHODS

This investigation utilized the quantitative research method to accomplish a descriptive research initiative. It was undertaken to examine the attitudes of professionals toward the elderly. Descriptive research aims to respond to the questions of what and how to illuminate a situation and to reveal the possible relationships between facts by effecting an in-depth evaluation of events and situations.

Study Group

The study group was achieved through the total population sampling method. The total population sampling is a type of purposive sampling technique that involves examining the entire population (i.e., the total population) that have a particular set of characteristics (e.g., specific attributes/traits, experience, knowledge, skills, exposure to an event, etc.) . 84 professionals (social worker, sociologist, psychologist, graduates of child development and family and consumer sciences) of social service centers in the province of Ankara and serving under the Ministry of Family, Labor and Social Services and 16 professionals of nursing homes and elderly care and rehabilitation centers were interviewed between 15.02.2018 and 15.05.2018. Previous research has evinced that the elderly population of the province of Ankara is increasing and that aging is a significant problem in the peripheries of the city (Gudul, Camlidere, Evren) (13). Thus, studies in the field of aging are needed (13). The province of Ankara was selected as sample in consideration of accessibility and in view of the research results. The social service center (SSC) is a service model in which the applications of the elderly people are received and are directed to services appropriate to their needs. Nursing homes and elderly care and rehabilitation centers (NHECRC) were preferred because they represent the primary institutions that provide care to the elderly. A total of 100 professionals were encompassed by the scope of this study. One interview was not included in the final analysis because the information obtained from it was incomplete. The distribution of the professionals participating in this research project is provided in the table below, which is organized by the names of institutions.

Data collection tools

The research data were collected by using the Interview Form developed by the researchers and through the Kogan's Attitude Toward Older People Scale (14).

Interview form

The interview form comprised eighteen questions including variables (age, gender, education, marital status, graduated department, etc.) that could affect the socio-demographic information of the participants and could influence their attitudes toward the elderly. The interview form was applied to five professionals to accomplish a preliminary trial. After the pilot study, the interview form took its final form.

Attitude toward Older People Scale

Kogan developed the Attitude toward Older People Scale to measure the attitudes of individuals toward older people. The Attitude toward Older People Scale comprises 34 items. 17 items of the scale test negative attitudes and the other 17 examine positive attitudes on a 6-point, Likert-type (Strongly Disagree, Disagree, Neither Agree nor Disagree, Agree, Strongly Agree) scale. For this instrument, high scores on the positive attitude items and low scores on the negative attitude items indicate an affirmative outlook toward the elderly. Expressions showing negative attitudes are coded and calculated as reverse items. The possible scores that can be

obtained from the negative and positive attitude dimensions toward the elderly range between 17-119 and total scores that may be obtained from the scale extend between 34 and 238.

The validity and reliability study of the scale in Turkish was performed by Duyan and Gelbal and the Cronbach's alpha value was calculated as 0.789 for positive attitudes and 0.794 for negative attitudes (6). The overall reliability coefficient of the scale was estimated as 0.840.

Ethical issues

Necessary permission was taken from the Hacettepe University Ethics Committee, the Ministry of Family and Social Policies (repealed-new name Ministry of Family, Labor and Social Services), the Directorate General of Family and Community Services, and the Directorate General of Services for Persons with Disabilities and the Elderly.

Data analysis

Data analysis was conducted using the SPSS 22 program and the 95% reliability level was applied. Since the scale's positive, negative, and total score skewness and kurtosis values were between +3 and −3, the parametric tests were applied in the analyses. The variance of the scale scores was analyzed using the t-test and ANOVA. The relationship between the scale's positive, negative, and total scores and age, profession, and years of experience in the field of elderly care was examined through the Pearson correlation analysis, a parametric test technique.

RESULTS

The mean age of the participants was 31.54 (sd=9.39); their years of professional experience was 6.03 years (sd=8.75); and their mean work experience in the domain of elderly care was 3.36 years (sd=4.49). 74.7% of the participants were female; 55.6% of the participants were single, and; 87.9% were undergraduates. Around half the participants (42.2%) lived with their family members. In addition, almost all participants (88.5%) asserted that they did not have to care for a dependent family member.

Nearly half of the participants (42.4%) were sociology graduates. 68.8% did not receive any education training with regard to aged people.

Table 1. Socio-demographic characteristics and mean scores of professionals (n=99).

Socio-demographic characteristics	Mean	Standard deviation
Age	31.54	9.39
Number of years worked as professional	6.03	8.75
Number of years worked in the field of elderly care	3.36	4.49
Gender		
Female	74	74.7
Male	24	24.2
Homosexual	1	1.0
Marital status		
Married	44	44.4
Single	55	55.6

Socio-demographic characteristics	Mean	Standard deviation
Education		
Undergraduate	87	87.9
Graduate	10	10.1
Postgraduate	2	2.0
Graduated department		
Sociology	42	42,4
Child Development	7	7.1
Social Work	35	35.4
Psychology	9	9.1
Psychological Counseling and Guidance	1	1.0
Family and Consumer Sciences	1	1.0
Teaching	4	4.0
Any education on the field of elderly welfare	0.879	0.02
No	66	68.8
Yes	30	31.3
Any study on the field of elderly welfare		
No	72	75.8
Yes	23	24.2
Existence of a dependent person		
n/a	88.5	85
Available	11	11.3

The positive attitude scores of the participants ranged between 34 and 91 and the mean score was 65.55 (sd=14.22). The negative attitude scores of the participants extended between 45 and 99, and the mean score of the participants was 67.62 (sd=9.18). The mean of the total scores of the participants was computed to be 133.16 (sd=20.16) and the scale total scores were between 96 and 190.

Table 2. Scale mean scores of professionals (n =99).+,

Scale	Min-Max	Mean	Standard deviation	Skewness	Kurtosis
Positive scale	34-91	65.55	14.22	−.231	−.399
Negative scale	45-99	67.62	9.80	.855	1.691
Scale total	96-190	133.16	20.16	.606	.162

No statistically significant difference was found with regard to age, gender, marital status and education level (undergraduate, graduate, and post graduate) between the scale's positive, negative, and total mean scores.

A statistically significant difference was found between the scale's positive mean score and the graduation major (p=0.002; p<0.05): the highest positive mean scores were obtained by the sociology, social work, and psychology departments respectively; the lowest positive mean score was obtained by graduates of the child development department. There was no statistically significant difference between the negative mean subscale score (p=0.348; p> 0.05) and the total mean subscale score (p=0.058; p>0.05).

There was also no statistically significant difference between the positive mean scores (p=0.621; p>0.05) with respect to the existence or nonexistence of a dependent person in the family. However, a statistically significant difference was found between the negative mean scores according to the existence or nonexistence of a dependent person (p=0.029; p<0.05).

The negative mean score of the professionals who cared for a dependent person was higher at 73.64. No statistically significant difference was found between the total mean subscale score pertaining to the existence or nonexistence of a dependent person (p=0.159; p>0.05). A negative correlation was found between years of work experience as professional and the positive mean scores (r=−0.204; p=0.05).

No significant relationship was found between the years of experience in the field of elderly care and the positive mean (p= 0.246; p>0.05); the negative mean (p=0.364; p>0.05); or the total mean (p=0.183; p>0.05).

Table 1. Socio-demographic characteristics and mean scores of professionals (n=99).

Socio-demographic characteristics	Scale positive mean(±sd)	Scale negative mean(±sd)	Scale total mean(±sd)
Gender			
Female	66.96 (±13.41)	66.82 (±9.88)	133.78 (±19.86)
Male	61.67 (±16.20)	70.29 (±9.41)	131.96 (±21.55)
	t=1.595	t=−1.511	t=.383
	p=.114	p=.134	p=.702
Marital status			
Married	65.73 (±15.51)	66.18 (±10.35)	133.91 (±21.82)
Single	65.40 (±13.23)	67.16 (±9.40)	132.56 (±18.91)
	t=.113	t=.512	t=.329
	p=.910	p=.610	p=.743
Education			
Undergraduate	65.66 (±14.01)	67.76 (±9.92)	133.41 (±20.79)
Graduate/Postgraduate	64.75 (±16.27)	66.58 (±9.19)	131.33 (±15.41)

Socio-demographic characteristics	Scale positive mean(±sd)	Scale negative mean(±sd)	Scale total mean(±sd)
	t=.206	t=.388	t=.334
	p=.837	p=.699	p=.739
Graduated department			
Sociology	66.69 (±12.53)	66.79 (±9.58)	133.48 (±18.61)
Child Development	45.71 (±11.61)	68.29 (±4.11)	114.00 (±13.30)
Social Work	66.37 (±14.74)	69.26 (±9.82)	135.63 (±20.81)
Psychology	66.56 (±11.56)	63.22 (±10.03)	129.78 (±18.45)
	F=5.310	F=1.114	F=2.581
	p=.002**	p=.348	p=.058
Any education on the field of elderly welfare			
No	65.44 (±13.52)	66.80 (±9.82)	132.24 (±19.60)
Yes	67.07 (±15.34)	69.37 (±9.82)	136.43 (±21.32)
	t=−.524	t=−1.185	t=−.945
	p=.602	p=.241	p=.347
Existence of a dependent person			
n/a	65.76 (±14.16)	66.72 (±9.46)	132.48 (±19.66)
Available	68.00 (±13.21)	73.64 (±11.67)	141.64 (±23.44)
	t=−.496	t=−2.221	t=−1.421
	p=.621	p=.029*	p=.159
Age	−.102	.039	−.053
	.316	.700	.604
Years worked as a professional	−.204*	−.063	−.172
	.050	.551	.099
Years worked in the field of elderly care	−.145	−.114	−.162
	.246	.364	.194

DISCUSSION

The majority of the participants of this study were women and sociologists. The results of the analysis revealed that the overall attitude scale scores of the professionals working in the domain of elderly care were positive toward the aged population even though they were very close to the average values. The negative attitudes toward the elderly were found to be closely related to the prejudices resulting from detrimental ideas that are attributed to old age (the need for care, limitations, etc.) These amendments are thought

to affect the attitude scale scores with regard to the elderly.

Graduates of different undergraduate departments participated in this investigation, and the most positive attitude scores toward the elderly were obtained by participants who were graduates of sociology, social work, and psychology respectively; the lowest positive attitude score was obtained by graduates with degrees in child development.

A study on the attitudes toward the elderly conducted at the University of Salamanca in Spain with students of medicine, occupational therapy, nursing, psychotherapy, psychology, social work, and dentistry similarly evidenced that the highest positive attitude score was obtained by students of social work and psychology, and nursing students formed the highest ratio of graduates considering elderly care as their field of specialization. (15).

In this study, it was found that attitude scores toward older people did not differ according to gender. The results of Doherty et al. (15) in the study conducted with the participation of 190 people, did not find a significant relationship between gender and attitude toward the older people. However, a study have shown that women receive more positive attitude scores than men (1).

The majority of the participants in this study had earned undergraduate degrees but more than half of them had not received any formal education in elderly care. However, the results exhibited that the level of education did not matter to the attitude scores toward older people. Study by Stewart et al. (16) obtained outcomes that were in opposition to the present study and found that positive attitudes toward the elderly are liable to increase with rising education levels.

It discovered that professionals who have to care for a dependent are more likely to exhibit higher negative attitude scores toward the elderly. The findings of another studies on this subject (17) contradict the outcomes of the present investigation; they evince that living with and caring for elderly individuals exerts a positive effect on people's attitudes toward the aged. Danis et al. (1), observed that living with and providing care to an elderly individual did not affect attitudes toward the elderly. A similar study conducted with 472 people in Spain also found no significant relationship between care-giving and attitudes toward the elderly (18). Although different studies have obtained differing results, the present analysis suggests that burnout may be a factor on the correlation this study found between care-giving for a dependent family member and negative attitudes toward the aged population. As a matter of fact, Kalinkara and Kalayci's study (19) with 209 randomly selected people providing homecare to elderly people over 65 who found it physically and mentally difficult to sustain the activities of daily life, found that the care burden caused emotional exhaustion and desensitization and that the exhaustion of the care-givers increased as the care burden grew.

The present study found no significant relationship between the age of the professionals and their attitudes toward the elderly. An examination of studies conducted in different countries yielded results that evinced a significant relationship between age and attitude. For example, an investigation in Germany concluded that negative attitude scores increased with advancing age and positive attitude scores decreased (17). Another scrutiny of professionals in Sweden noted that professional care-givers older than 51 years exhibited a more positive attitude toward the elderly (20). These differences between the findings demonstrate that attitudes with regard to aging change from culture to culture.

This study conducted on graduates of different departments found that negative attitudes toward older people increased with years of work experience. This outcome supports the results obtained by Engstrom and Fagerberg (20), who

reported that professional care-givers who had worked in the field for over 21 years demonstrated negative attitude scale scores toward the elderly.

Consequently, the following recommendations are tendered:

- Organizing vocational training for professionals would help to augment and strengthen knowledge related elderly care. Such training programs should incorporate informative content about the rights and needs of the elderly, highlight positive examples, and aim at raising awareness and consciousness about aging.
- Policies that generally support the professionals who have to care for a dependent to prevent burnout related to the burden of providing care should be established.

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CASE REPORT

SYNCHRONOUS MANTLE CELL LYMPHOMA OF LARYNX AND NASOPHARYNX

Abstract

Mantle cell lymphoma is a variant of non-Hodgkin's lymphoma and is known as a mature peripheral B-cell lymphoid neoplasm. Lymphomas of the larynx and nasopharynx are rare; mantle cell lymphoma is exceedingly rare. In most mantle cell lymphoma cases, the tumoral lymphoid cells express nuclear cyclin D1 due to a t(11;14) chromosomal translocation between an IGH gene and CCND1. This is considered to be an important genetic event in mantle cell lymphoma. There are case reports in the literature on various histologic types of non-Hodgkin's lymphomas which affect the nasopharynx and larynx simultaneously. However, to the best of our knowledge, mantle cell lymphoma involvement of the nasopharynx and larynx simultaneously has not been reported. In this case report, the detailed clinical manifestations and pathological findings of a mantle cell lymphoma patient have been presented along with a literature review of mantle cell lymphoma.

Keywords: Mantle Cell Lymphoma; Lymphoma; Larynx; Nasopharynx.

OLGU SUNUMU

LARENKS VE NAZOFARENKSTE SENKRON MANTLE HÜCRELİ LENFOMA

Öz

Mantle hücreli lenfoma, Non-Hodgkin lenfomanın bir çeşididir ve matür periferik B hücreli bir lenfoid neoplazi olarak bilinir. Larenks ve nazofarenks lenfoması nadirdir; mantle hücreli lenfoma aşırı derecede nadirdir. Çoğu mantle hücreli lenfoma vakasında; tümör lenfoid hücreleri, IGH geni ve CCND1 arasındaki t (11; 14) kromozomal translokasyonu nedeniyle nükleer siklin D 1'i eksprese eder. Bunun mantle hücreli lenfomada önemli bir genetik olay olduğu düşünülmektedir. Literatürde nazofarenks ve larenksi eş zamanlı etkileyen Non-Hodgkin lenfomanın çeşitli histolojik tipleri hakkında olgu sunumları bulunmaktadır. Bununla birlikte, bildiğimiz kadarıyla, nazofarenks ve larenkste eşzamanlı olarak mantle hücreli lenfoma tutulumu bildirilmemiştir. Bu olgu sunumunda, bir mantle hücreli lenfoma hastasının ayrıntılı klinik belirtileri ve patolojik bulguları, mantle hücreli lenfomanın literatür taraması ile birlikte sunulmuştur.

Anahtar: Sözcükler: Mantle Hücreli Lenfoma; Lenfoma; Larenks; Nazofarenks.

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INTRODUCTION

Non-Hodgkin's lymphomas (NHLs) are known by ear, nose, and throat (ENT) physicians to affect lymphoid tissues in Waldeyer's ring (1). Lymphoma of the nasopharynx represents about 8% of the head and neck lymphomas (2). Mantle cell lymphoma (MCL) is a variant of NHL and is known as a mature peripheral B-cell lymphoid neoplasm (3). MCL is among the most common lymphomas involving the nasopharynx, after diffuse large B-cell lymphoma. MCL is an aggressive subtype of NHL and only comprises 3–4% of all Waldeyer's ring lymphomas and 5% of all NHLs (4). The median age of MCL patients is about 70 years and more males are diagnosed with MCL than females (1).

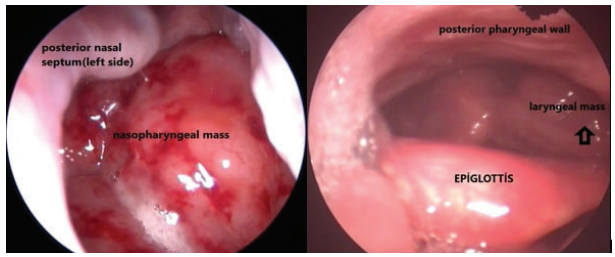
Squamous cell carcinoma is the most common malignant tumor of the larynx. Primary hematopoietic neoplasms constitute less than 1% of the malignant laryngeal tumors. Among these hematopoietic neoplasms, lymphoma ranks as the second most common primary laryngeal tumor, after plasmacytomas. Lymphoma of the larynx is rare; MCL is exceedingly rare (5).

There are case reports in the literature on various histologic types of NHLs which affect the nasopharynx and larynx simultaneously. However, to the best of our knowledge, MCL involvement of the nasopharynx and larynx simultaneously has not been reported. In this case report, the detailed clinical manifestations and pathological findings of an MCL patient have been presented along with a literature review of MCL.

CASE

A 76-year-old male patient was admitted to our outpatient clinic with complaints of a nasal obstruction that particularly increased over the last month. Due to existing hypothyroidism, the patient was taking 100 mg/day levothyroxine. Though he quit smoking 20 years earlier, he had a history of smoking one pack a day for 24 years. Examination with a flexible fiberoptic endoscopy revealed not only a midline nasopharyngeal mass but also a mass originating from the left aryepiglottic fold (Figure 1).

Figure 1. Endoscopic images of nasopharynx and larynx.



Apart from those findings, the ENT examination was normal. Biopsies were obtained from both masses in the nasopharynx and the larynx under general anesthesia. The specimens were examined in the Pathology Department. Histopathological examination of the hematoxylin and eosin-stained slides of the nasopharynx and larynx biopsies showed similar appearances. Diffuse monomorphic lymphoid cell infiltration was seen under the squamous epithelium in the larynx and pseudostratified epithelium in the nasopharynx biopsies. The lymphoid cells were small-to-medium-sized with slightly irregular nuclear contours and inconspicuous nucleoli (Figure 2 and Figure 3). In the immunohistochemical examination, these lymphoid cells stained intensely with CD20, CD5, and bcl2 antibodies, and nuclear cyclin D1 positivity was detected in both biopsies (Figure 2 and Figure 3).

Figure 2. Larynx stained with hematoxylin and eosin (A), anti-CD5 (B), anti-CD20 (C), and anti-cyclin D1 (D).

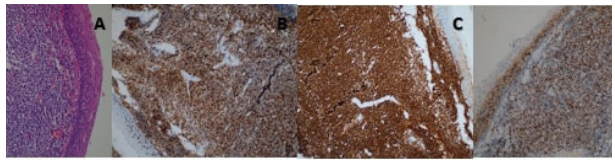
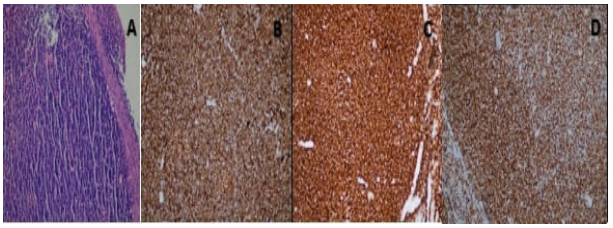


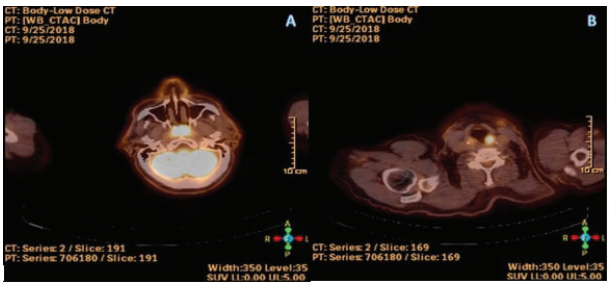
Figure 3. Nasopharynx stained with hematoxylin and eosin (A), anti-CD5 (B), anti-CD20 (C), and anti-cyclin D1 (D).



The cells were negative for CD10 and CD23 and Pankeratin was positive on the surface of the epithelial cells but not in the tumor cells. The morphological and immunohistochemical findings in both biopsies were consistent with MCL.

The Positron emission tomography–computed tomography (PET-CT) screening examination showed a 4 × 4 cm nasopharyngeal hypermetabolic mass (SUV max 9.3) and a 2-cm left lateral laryngeal mass (SUV max 6.6). Moreover, a 4-cm hypermetabolic lesion (SUV max 7.5) over the base of the tongue and 2-cm cervical lymph nodes (SUV MAX 5.0) in both jugular lymphatic sequences were seen (Figure 4).

Figure 4. PET-CT axial image of the



The patient was sent to the Hematology Department for consultation. The R-COP chemotherapy protocol was administered to the patient in eight sessions, and simultaneous radiotherapy was applied. There were no pathological findings in PET-CTs taken three and five months after treatment. Flexible fiberoptic examinations of the larynx and nasopharynx were also normal. The patient was in remission at his 6-month follow-up examination.

DISCUSSION

Lymphoid lesions of the head and neck mainly affect the nasopharynx, nasal and paranasal sinuses, and the salivary glands. These three structures are involved with different forms of lymphoid malignancies and can serve as models for the mechanisms of lymphomagenesis (3).

The nasopharynx and Waldeyer's ring functionally mimic the mucosal-associated lymphoid tissue (MALT) of the gastrointestinal tract and are most commonly involved in B-cell lymphomas, of which MCL is a relatively frequent subtype. As Waldeyer's ring is the site of copious lymphoid tissue, both lymphoid hyperplasia and lymphoma can arise from nasopharyngeal lymphoid tissues (3) From many perspectives, the lymphoid tissue of the nasopharynx is similar to the lymphoid tissues of the gastrointestinal tract and is considered a part of the MALT system (3). Follicular hyperplasia is the most commonly seen lymphoid reaction. Lymphocytes commonly infiltrate the overlying epithelium, leading to lymphoepithelial lesions (3). The nasopharynx is the second most common site of lymphomas, after the tonsils (6). Although malignancies of the hematopoietic system are less common than malignant epithelial tumors of the nasopharynx, NHL should be kept in mind in the differential diagnosis because the treatment modalities for these two nasopharyngeal malignancies are completely different. In our case, we decided that a punch biopsy should be performed for the new nasal complaints under endoscopic examination.

Laryngeal lymphomas are rare and constitute less than 1% of all laryngeal neoplasms. The most common site of involvement of primary laryngeal lymphomas is the supraglottic region because

it contains lymphoid collections in the lamina propria and ventricles. This should be kept in mind in the differential diagnosis of a non-ulcerate polypoid mass in the neck region, especially in the supraglottic area, including the epiglottis and aryepiglottic fold (5, 7). The MCL in our case involved the supraglottic region of the larynx and appeared non-ulcerated, which is consistent with the literature.

In 2012, Naciri et al. claimed to have reported the first case of MCL of the larynx. However, a literature review revealed that Kelly et al. reported MCL presenting as a saccular cyst of the larynx in 2011 (8). Lymphoma of the larynx tends to influence other sites as well, including the salivary glands, thyroid, nasopharynx, and tonsils (7). Different kinds of histological subtypes of laryngeal lymphomas have been reported. The great majority of laryngeal NHLs are of B-cell lineage, frequently presenting as diffuse large cell lymphoma. Very few T-cell lineage NHLs and only one MCL have been reported (9, 10). We found no case of coexistent MCL of the larynx and nasopharynx in the literature. Our case is the first reported MCL involving larynx and nasopharynx simultaneously and the second report of laryngeal MCL after Naciri. Though it was shown by PET-CT but not proven histologically, a third mass lesion on the base of the tongue might also be considered a lymphoma.

The age of onset for laryngeal lymphomas varies between 4 and 81 years, with the mean age of occurrence in the seventh decade of life (11). Our patient was 76-years-old, consistent with previously reported patients.

It is difficult to diagnose nasopharyngeal lymphoma since it manifests few clinical symptoms that mimic benign entities, such as adenoid vegetation and rhinitis. Laryngeal malignancies usually display symptoms, such as dysphonia, dysphagia, dyspnea, and swollen cervical lymph nodes. Our case presented with only a nasal obstruction but no laryngeal symptoms. We detected a coexistent mass lesion in the nasopharynx and supraglottic region of the larynx by a complete fiberoptic endoscopic examination.

MCL is a mature B-cell lymphoma and the classical type is composed of small-to-medium-sized lymphocytes with irregular nuclei (12, 13). The nuclei have dispersed chromatin but inconspicuous nucleoli (12), as seen in our case. However, a broad spectrum of morphologic features, ranging from small-cell to blastoid types also exists and these may reflect distinct biologic characteristics (13). The histopathological variants, including blastoid and pleomorphic types, can cause diagnostic confusion (12). The variants are derived from peripheral B-cells of the inner mantle zone and most cases are pre-germinal center B-cells (12). As detected in our case, the tumoral lymphoid cells in most MCL cases express nuclear cyclin D1 due to a t(11;14) chromosomal translocation between an IGH gene and CCND1. This is considered to be an important genetic event in MCL (12, 14, 15).

There is no consensus on the treatment of MCL. Early-stage patients (stages I–II) are usually treated with chemotherapy and radiotherapy, but those with advanced forms (stages III and IV) are treated with chemotherapy only. MCL is an aggressive lymphoma with the poorest long-term survival among the many subtypes (13). Similar to the laryngeal version, MCL of the nasopharynx has an aggressive clinical course with frequent relapses after conventional chemotherapy (16). We managed our patient with chemotherapy and radiotherapy modalities simultaneously.

In conclusion, the diagnosis of masses in the nasal cavity, nasopharynx, oral cavity, oropharynx, and endolarynx is very important in otorhinolaryngology practice because the treatment modality (surgery, chemotherapy, or radiotherapy) is determined according to the pathological diagnosis of the mass. Here, we emphasize that a simultaneous mass in the nasopharynx and larynx may be MCL and that MCL can also be observed in the head and neck areas.

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CASE REPORT

CHARLES BONNET SYNDROME IN FUNGAL KERATITIS AND AGE-RELATED MACULAR DEGENERATION: A CASE REPORT

Abstract

The primary symptom of Charles Bonnet Syndrome is the occurrence of chronic visual hallucinations, which are observed in patients belonging to the geriatric population who had recently experienced a significant loss of vision. Charles Bonnet Syndrome is under-recognised owing to its low awareness among clinicians. We report a case of a 78-year-old man with blindness due to keratitis and age-related macular degeneration brought for a psychiatric consultation after the onset of visual hallucinations. Black insects playing on the patient's body along with visuals of the meals others could not see characterised the patient's hallucinations. Physicians are expected to have substantial knowledge of Charles Bonnet Syndrome for its correct diagnosis and management.

Keywords: Charles Bonnet Syndrome; Visual hallucinations; Keratitis; Age-related macular degeneration; Vision disorders.

OLGU SUNUMU

FUNGAL KERATIT VE YAŞA BAĞLI MAKULA DEJENERASYONUNDA GELİŞEN CHARLES BONNET SENDROMU: BIR OLGU SUNUMU

Öz

Charles Bonnet Sendromu ileri derecede görme kaybı yaşayan özellikle geriatrik hasta popülasyonunda sıklıkla kronik görsel halüsinasyonların ön planda olduğu, çeşitli halüsinasyonlar ile karakterize bir klinik tablodur. Charles Bonnet Sendromu klinisyenler arasında hastalığın farkındalığının ve tanınırlığının az olması nedeniyle az tanı veya yanlış tanı almaktadır. Burada yaşa bağlı makula dejenerasyonu ve fungal keratit tablolarının birlikte olması ile giden ve ciddi görme kaybı yaşaması sonrası yemeklerinin üzerinde gördüğü, diğer insanların görmediği siyah böceklerle karakterize görsel halüsinasyonları nedeniyle psikiyatri bölümünden konsültasyon istenen 78 yaşında herhangi bir nörolojik hastalığı olmayan bir erkek olgu sunulmuştur. Hekimlerin Charles Bonnet Sendromu konusunda bilgi sahibi olmaları ve bu konuda farkındalığı artırmak amaçlanmaktadır.

Anahtar sözcükler: Charles Bonnet Sendromu; Görsel halüsinasyonlar; Keratit; Yaşa bağlı makula dejenerasyonu; Görme bozuklukları.

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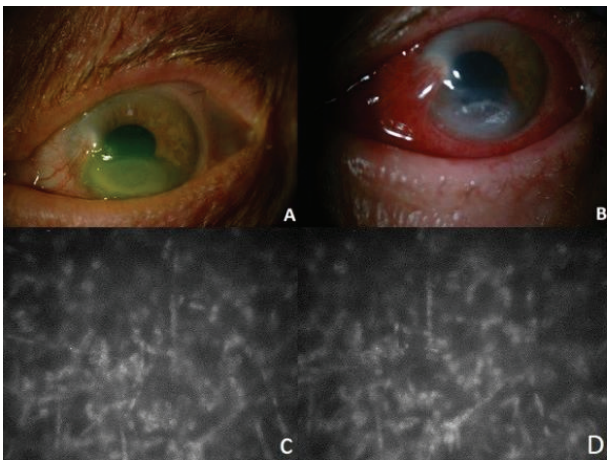
INTRODUCTION

The primary symptom of Charles Bonnet syndrome (CBS) is the occurrence of chronic visual hallucinations, which are observed in patients of the geriatric population who had recently experienced a considerable loss of vision (1). CBS has been primarily observed in patients with an ophthalmic disease; however, stroke patients with hemianopia have also reported its occurrence (2, 3). CBS was first described by Charles Bonnet in 1769, when his grandfather experienced visual hallucinations after the loss of vision due to cataract (3). Bonnet documented the complex visual hallucinations experienced by his grandfather, Charles Lullin and published his findings in a report (3). The condition was later termed as CBS. Ophthalmologists and neurologists use the term CBS to describe visual hallucinations occurring due to an ocular disease or a visual pathway disease.

CASE

We report a case of a 78-year-old man with blindness due to fungal keratitis and age-related macular degeneration brought for a psychiatric consultation after the onset of visual hallucinations. The best-corrected visual acuity observed after the ophthalmologic examination was 0.1 on the right eye and 0.05 with Snellen on the left eye. Upon the examination of the biomicroscopic anterior segment, the right cornea was normal but the slit-lamp examination revealed a corneal epithelial defect of 4×4 mm with infiltrate, and the inferior peripheral cornea on the left side was covered due to superficial corneal neovascularisation (Fig. 1A). Corneal scrapings were sent for cultures, such as for bacteria and fungi. The constructed in vivo confocal microscopy (confoscan 3.4, Nidek Co. Ltd., Gamagori, Japan) revealed fungal filaments in the stroma deep (Fig.1C, 1D). The patient was initially administered with topical voriconazole, ciprofloxacin and sefalosporine on an hourly basis. The corneal culture grew nothing prominent. On the follow-up visit, the cornea was found to be cleared (Fig. 1B); hence, there was a slight deterioration in the patient's condition. Since he was diagnosed with zona four months ago, amniotic membrane transplantation was performed to promote re-epithelialisation due to neurotrophic cornea. The right eye had atrophic age-related macular degeneration, which was observed in the fundus examination. Black insects playing on the patient's body along with visuals of the meals others could not see characterised the patient's hallucinations. During the time when the patient was brought for psychiatric consultation, he was having subjective visual experiences for about one week with the conditions worsening progressively. It started two weeks after the keratitis treatment. The symptoms gradually became worse. As the symptoms progressed, he became agitated. During the first visit, he was fully conscious, alert and oriented to the voices of his accompanied relatives. He was cooperative, and his speech was appropriate. His recent and memories were intact. Cognitive assessment was performed by using Mini-Mental Status Examination, on which he scored 18/20, with an inability to assess some of the domains, such as orientation, naming, reading,

Figure 1. Fungal keratitis in the left eye A. Before the antimicrobial therapy, B. On the follow-up visit, C, D. Fungal filaments in the corneal stroma with IVCM.



writing and construction, due to his blindness. The patient missed one point on recall and another point of attention/concentration. His neurological examination showed no acute intracranial findings and was negative for any acute changes. CBS was confirmed, and differential diagnosis was performed. Supportive care was provided, and the patient was discharged for home.

CONCLUSION

The purpose of this case report is to examine the characteristics of CBS with ophthalmic diseases. The prevalence of CBS has different variabilities and ranges from 0.4% to 30% (4, 5). Khan et al described the highest prevalence of CBS in their study (4). Ophthalmologists and neurologists use the term CBS to describe the visual hallucinations occurring due to an ocular disease or a visual pathway disease. In our case report, the patient had visual hallucinations; however, hearing or smelling hallucinations with CBS have also been reported. Vale CT et al presented eight patients with CBS and visual hallucinations. Aetiologies of these patents were severe glaucoma, optic neuropathy and age-related macular degenerations (3). Leandro JE et al calculated and found an increased prevalence of CBS in patients with the age-related macular degenerations (5). However, in our study, our patient was also diagnosed with fungal keratitis, and this diagnosis is uncommon in the literature. Diagnostic criteria for CBS is still not clear (6). The currently accepted theory propounds that vision loss leads to visual sensory deafferentation of the visual association cortex, further raising disinhibition and later spontaneous alerting of the visual cortical areas (3, 4). The brain activity in the absence of visual input has been compared with what occurs in phantom pain syndromes (7). Another theory is the release phenomenon, where the lost input to the primary visual areas suggests a disinhibition of visual association regions, further contributing to a release of visual hallucinations (6). Among the pathological causes, hepatic disorders, toxic-metabolic reasons, uraemia, encephalopathy associated with cardiac insufficiency, endocrine disorders, vitamin deficiency, inflammatory and infectious diseases must be considered and differentiated accordingly. All patients should be subjected to neurologic examination and brain MRI for organic reasons. The visual hallucinations of patients were revealed as either simple geometric patterns or complex recognisable shapes such as pictures or faces. Anticonvulsants, antidepressants, neuroleptic and cholinesterase inhibitors have been tried with positive and convenient results. CBS diagnostic criteria include full or partial retention of sight into the unreal nature of the hallucinations, the presence of formed, complex, persistent or repetitive stereotyped visual hallucinations, the absence of hallucinations in other sensory modalities, and the absence of primary or secondary delusions (6). CBS is under-recognised owing to the low awareness among clinicians. The symptoms can persist for years. We must rule out any other pathological causes and referral to psychiatrist for the evaluation of the cognitive function. Therefore, the substantial knowledge of CBS allows for its correct diagnosis and management.

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