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From The Editor In Chief

As it is well stated previously, The Turkish Geriatrics Society is a national, neutral, nonprofit organization which aims to increase the standards in the field of geriatrics including education, patient care and treatment. The society also aims to create or make contributions for the development of technical, scientific and social facilities and it also cooperates with any and all related institutions, organizations, foundations and societies for this purpose.

In order to achieve its goals Turkish Geriatrics Society works as explained below:

- The society cooperates with all related institutions in order to reach the standards in the education of geriatrics.
- The society attempts to facilitate the communication with and among its members in order to increase their knowledge and awareness on the developments and innovations in the field of geriatrics.
- The society supports its members and those making scientific research on geriatrics for their research activities and also organizes competitions, gives national and international research scholarships.
- The society aims to create and/or apply new projects in order to increase public awareness on geriatrics. The society makes all necessary cooperations with any institutions for this purpose.
- The society supports its members and those making contributions in the field of geriatrics for attending national and international meeting.
- The society gives education parallel to its purposes to its members, to public and those making contributions on the field of geriatrics. To achieve this target holds or organizes congresses, seminars, conferences, symposiums and similar scientific, managerial and social meetings in the field of geriatrics.

International Day of Older Persons is an oportunity to increase the awareness of the public about the various issues of elder persons. And as its announced by the Division for Social Policy and Development Ageing of the United Nations that, the theme of International Day of Older Persons 2017 is "Stepping into the Future: Tapping the Talents, Contributions and Participation of Older Persons in Society."

According to the UN authorities; "Stepping into the future with pledges that no one will be left behind, it is starkly evident that the need to tap into the often overlooked and under-appreciated contributions of older persons is not only essential to older persons' well-being, but also imperative for sustainable development processes".

As the executive Board of Directors of Turkish Geriatrics Society, we cordially believe that not only the scientific education activities, but the public education programs of our society will play an important role to achieve this goal.

Prof. Yeşim GOKCE KUTSAL, M.D.

Editor in Chief

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RESEARCH

BREAST CANCER IN ELDERLY WOMEN: EFFECTS OF SCREENING PROGRAMS AND CHOICE OF SURGICAL METHOD

Abstract

Introduction: Although breast cancer is more common in elderly women > 65 years, its diagnosis is delayed; thus, the surgical procedure is affected. In this study, we aimed to investigate the status of the screening program, its adequacy in early diagnosis, and its effect on the choice of surgical method.

Materials and Method: In total, 124 old women with breast cancer who were operated at our clinic in the last 3 years were divided into groups A, B, C, and D according to their age (65–70, 70–75, 75–80 and >80 years). The patients were retrospectively examined in terms of diagnostic method, tumor size, and surgical method.

Results: The mean age of the patients was 71.25 (65–94) years. There were 63 patients in group A, 31 patients in group B, 17 patients in group C, and 13 patients in group D. Thirty-four (54%) patients in group A, 9 (29%) patients in group B, 3 (18%) patients in group C, and 1 (8%) patient in group D were diagnosed using mammography and the others were diagnosed based on clinical symptoms. The median tumor size was 2.4, 3.2, 3.3, and 4 cm in groups A, B, C, and D, respectively. Breast-conserving surgery was performed on 50 (79%) patients in group A, 18 (58%) patients in group B, 11 (64%) patients in group C, and 2 (15%) patients in group D, and mastectomy was performed on the remaining patients. Data were compared with the independent t-test (one simple); differences between the groups were found to be significant for tumor size (p >0.02) and surgical method (p= 0.029).

Conclusion: The tumor size increased with increasing age and the rate of breast-conserving surgery decreased in our patients. Radiological screening has a decisive place in early diagnosis of breast cancer. Screening should continue in women whose expected length of life is 10 years. In our country, the life expectancy is 86 years for 65-year-old women, and the existing program, which is terminated at 70 years, is considered to be inadequate. According to literature and our data, it should be continued until 75 years so that early diagnosis can be possible in the elderly and breast-conserving surgery can be performed.

Key Words: Aged; Breast Neoplasm; Mass Screening; Mastectomy, Segmental; Mastectomy

ARAŞTIRMA

YAŞLI KADINLARDA MEME KANSERİ: TARAMA PROGRAMLARININ ETKİLERİ VE CERRAHİ YÖNTEMİN SEÇİMİ

Öz

Giriş: Yaşam süresi uzadıkça 65 yaş üstü (yaşlı) kadınlarda meme kanseri daha sık ancak geç tanı almakta ve uygulanan cerrahi etkilenmektedir. Bu çalışmada tarama programının durumunu, erken tanı için yeterliliğini ve cerrahi yöntem seçimine etkisini araştırmayı amaçladık.

Gereç ve Yöntem: Kliniğimizde son üç senede ameliyat olan meme kanserli 124 yaşlı kadın, yaşa göre (65-70, 70-75, 75-80 ve 80 üstü) A, B, C, D gruplarına ayrıldı. Olgular retrospektif olarak tanı alma şekli, tümör boyutu ve cerrahi yöntem bakımından irdelendi

Bulgular: Yaş ortalaması 71,25 (65-94) idi, A grubunda 63, B de 31, C de 17 ve D de 13 olgu yer aldı. A grubunda 34 (%54), B: 9 (%29), C: 3(%18) ve D de 1olgu (%8) mamografi ile, diğerleri ise klinik semptom ile tanı aldı. Ortanca tümör boyu A grubunda 2,4, B de 3,2, C de 3,3 ve D de 4 cm idi. A grubunda 50 (%79) B grubunda18 (%58), C grubunda 11 (%64) ve D grubunda 2 (%15) olguya meme koruyucu cerrahi, diğerlerine mastektomi yapıldı. Veriler bağımsız t (one simple) testi ile karşılaştırıldı, gruplar arasında tümör boyutu (p:0,002) ve cerrahi yöntem için (p:0,029) fark anlamlı bulundu.

Sonuç: Olgularımızda yaş arttıkça tümör çapı artmış, meme koruyucu cerrahi oranı azalmıştır. Meme kanserinin erken tanısı için radyolojik tarama belirleyici yere sahiptir. Beklenen yaşam süresi 10 yıl olan kadınlarda tarama devam etmelidir. Ülkemizde 65 yaşına gelmiş kadınlarda yaşam süresi 85 olarak hesaplanmaktadır ve 70 yaşında sonlanan mevcut program yetersiz görünmektedir, literatüre ve verilerimize göre 75 yaşına dek sürmelidir¸ böylece yaşlılarda erken evrede tanı mümkün olur ve uygulanabilir

Anahtar Sözcükler: Yaşlı; Meme kanseri; Kitle taraması; Mastektomi, Segmental mastektomi

INTRODUCTION

Breast cancer is the most common type of cancer in women, both in our country and in the world, and is also an important cause of death. Breast cancer with heterogeneous characteristics is more common in elderly patients and has a better prognosis than in patients diagnosed at a younger age. Mastectomies are more common in elderly patients with breast cancer than in younger ones, whereas breast-conserving surgery (BCS) and radiotherapy (RT) are also used as standard treatment in appropriate cases (1,2).

As a surgical method, BCS has similarly successful results as mastectomy in terms of disease-free and total survival and is even more advantageous with respect to the quality of life. Late diagnosis in elderly women is difficult to treat, and because tolerance to adjuvant treatments is low in some individuals, it can lead to incomplete chemotherapy, particularly due to the toxic effects of chemotherapy, thus negatively affecting the length and quality of life (3). Radiological screening allows early diagnosis of breast cancer. When breast cancer is diagnosed at an early stage in older women, BCS can be performed independent of age by better controlling the accompanying diseases (2,3).

In this study, we aimed to investigate the first diagnostic method in women > 65 years (aged), their participation in screening and performed surgical technique, and to investigate whether screening and surgical treatment application is compatible with an increase in life span.

MATERIALS AND METHOD

In total, 124 women > 65 years who underwent breast cancer treatment at our clinic between January 2014 and January 2017 were included in this study. The patients were divided into four groups. Group A, B, C, and D consisted of patients between 65 and 69 years, between 70 and 74 years, between 75 and 79 years, and > 80 years, respectively. The patients were analyzed and retrospectively compared with respect to age, tumor size, and surgical method. The relationship between different types of surgery performed according to age and tumor size was investigated. The effect of terminating screening at 70 years on early diagnosis and therefore, the choice of surgical method was questioned.

RESULTS

The mean age was 71.25 (65–94) years. There were 63 patients in group A, 31 in group B, 17 in group C, and 13 patients in group D. The mean age of patients in groups A, B, C, and D was 66.8, 72, 76.7, and 84 years. The tumor was found radiologically in 47 patients (38.7%) and through physical examination in the remaining patients (61.3%) where a complaint of pain and accompanying palpable swelling were present.

The number of patients diagnosed by screening mammography was 34 (54%) in group A, 9 (29%) in group B, 3 (18%) in group C, and 1 (8%) in group D. According to the TNM classification, the tumor

size was T1 and T2 with a mean diameter of 2.4 cm in group A, T2 with a mean diameter of 3.2 cm in group B, T2 with a mean diameter of 3.3 cm in group C, and T2 with a mean diameter of 4 cm in group D (Graphic 1I). The treatment plan for all patients has been planned since diagnosis by a multidisciplinary breast council. The treatment was started with neoadjuvant chemotherapy (NAC) in eight patients in group A, four patients in group B, and two patients in group C, and BCS was performed by marking tumors before NAC in appropriate patients. Although BCS was performed in 50 (79%) of the 63 patients in group A, 18 (58%) of the 31 patients in group B, 11 (64%) of the 17 patients in group C, and 3 (15%) of 13 patients in group D, mastectomy was performed in the remaining 13 (21%) patients in group A, 13 (42%) patients in group B, and 13 (35%) patients in group C and 7 (%54) patients underwent mastectomy in group D and 4 women underwent hormone therapy

(HT) after removal of the tumor only (Graphic 2-3). When data were compared by the independent t-test (one simple test), the difference between the groups was found to be significant in terms of tumor size (p= 0.002) and BCS (p= 0.029). (Table1).

DISCUSSION

The population of the world is getting older and the incidence of breast cancer is increasing with age. In countries with a life span longer than 80 years, the incidence of breast cancer in the 75–79 age group has been also increasing. It is reported that the elderly (≥80 years) group has been also rapidly expanding because of important developments in the field of public health (2). However, it is not known whether mammography screening helps women aged ≥ 75 years live longer because there are no sufficient randomized controlled trials in this area. According to our classical knowledge, although breast cancer is observed most frequently in patients of approximately 61 years, in the recent publications, it has been reported that an increasing number of breast cancers is diagnosed in patients at later ages and the second peak point of diagnosis is approximately 74 years (4). Treatment of older patients may be different because of additional health problems. When the treatment is planned, functions of the person and the effects of the treatment on the quality of life should be considered. There are very few studies and data available in evidence-based guidelines for the elderly with breast cancers on screening as well as treatment. This can reduce the likelihood of early diagnosis. On the other hand, there are some difficulties in treatment. Available data on the elderly are insufficient for estimating the likelihood of toxicity for those receiving systemic therapy; existing data include only the functional status, additional illnesses, social support, nutritional status, and psychological status. Physicians who aim to overcome this problem may be able to treat with locoregional and minimally invasive options only by diagnosing at an early stage (4).

Early diagnosis of cancer by mammography screening can affect the likelihood of death for 10 years. In older patients, the sensitivity of mammography increases. If breast cancer is detected at an early stage by screening, it follows a good course and is less costly to treat, considering the fact that it will save money on chemotherapy (CT) and metastasis (5). Studies show that in patients > 70 years, screening will eliminate the probability of death in 10 years in 1-2 of 1000 women (5,6).

There may also be some problems with the widespread use of mammography. Possible problems, such as excessive biopsy, as well as concerns and unnecessary costs can be overcome with individual approaches and experienced radiologists. If there is a life expectancy of less than 10 years, screening is not recommended (5). Mammographic modeling studies in the literature have revealed that breast cancer screening until 75 years could reduce breast cancer mortality. Many guidelines suggest that the screening should continue until 75 years, and it is reported that depending on the person, it can be continued throughout their life (5,6).

In daily practice, the number of patients > 70 years has been increasing. There are publications reporting that half of the patient with breast cancer are 65 years old and 30% are > 70 years old (6,7). Van der Walde et al found that the incidence of breast cancer in the age range of 74–79 years increased; 474 of the 100,000 women were diagnosed with breast cancer and 100 of them had died. They reported that in 2012, 1.5 million older patients with breast cancer (870,000) were women > 75 years (8).

The life span in our country has also prolonged. Generally, women live longer than men. According to the Turkish Statistical Institute (TURKSTAT) 2014 report, life expectancy at birth, which was 68.8 years in 1994, increased by 7.5 years in 19 years and increased to 76.3 years in 2013 (9). According to 2016 data, the overall life span in Turkey is 78 years; 75.3 years for men and 80.7 years for women.

According to the integrated database 2014 data, age-specific rates of breast cancer in women in our country are at the highest level in the age range of 60–64 years. It is observed that it continues at this speed at the age range of 65–69 years, reaches the highest point again in the age range of 70–74 years, remains in the same level in the age range of 74–79 years, and gradually becomes less diagnosed at later ages (Figure 1). The difference between genders at birth is 5.4 years, with the life expectancy being higher in women, and the life expectancy over 65 years gradually increases. It is calculated that women who reach 65 years in our country will live an average 19.4 years, i.e., till 85 years. According to cancer statistics, 15% of women with a diagnosis of breast cancer in our country are women > 70 years (9). It is inevitable that this number increases with the increasing life span. Currently, screening for breast cancer is performed every 2 years in patients between 50 and 70 years, which results in the loss of opportunity for early diagnosis at ≥70 years (Table 2).

In the series we presented, the average tumor diameter was T1 with an average of 2 cm in group A, while there were no T1 tumors in group B, C, and D. A total of 38% patients were detected by radiological screening. Although more than half of the patients (58%) were diagnosed by mammography in group A, it was observed that mammography was performed in 30% patients in group B, 22% patients in group C, and only in 1 patient (8%) in group D which included patients > 80 years. The remaining patients were diagnosed because of palpable mass. When choosing a breast surgery method, the opportunity for performing BCS in patients with T2-T3 has been diminishing, and RT and CT applications may be a deterrent. When data were analyzed, the fact that the tumor diameter in group A was smaller than that in other groups was thought to be associated with mammographic screening, which is currently performed although not adequately and widespread, and the fact that the tumor size was larger in groups B, C, and D was associated with the fact that patients requested examination only after they palpated the tumor themselves. Therefore, it is important to diagnose breast cancer, which follows a good and slow course in the early stages, by screening in the elderly. The current screening program should be continued until 75 years, given that the life expectancy has reached 85 years in women in our country.

In a study planned to suggest proposals to health insurance providers, Enger SM et al studied a group of 1859 elderly women with breast cancer in four separate age groups in terms of tumor stage, additional health problems, and whether they received standard treatment and reached the following conclusions. Age is an independent risk factor. According to the Charlson Comorbidity Index, 70% patients diagnosed at early stage have good prognostic features and a low recurrence score. Mastectomy and BCS are performed almost equally as surgical methods, and the superiority of mastectomy is not revealed. As a result of this study, treatment options and outcomes were determined to be associated with age, general condition, and stage. It has been shown that age alone is not a contraindication in the choice of the surgical method (10).

In elderly patients, there may be additional health problems and in those ≥80 years, this situation becomes more apparent. In patients diagnosed at advanced ages and stages, CT is not preferred because of its toxic effects and as standard protocols cannot be used, and the need for CT in the early stage is minimal (10). Given the fact that the results of adjuvant HT and RT are almost similar, it would not be correct to avoid BCS because of possible additional disease in elderly patients. According to the results of studies involving extensive case series, it has been argued that majority of older patients with breast cancers may have undergone unnecessary CT and/or RT (11-13). In selected patients, RT itself, its duration, and dose are studied separately and RT studies show that although there may be some benefits for



the patients between 70 and79 years, RT does not provide any additional benefit in older patients (11).

Mastectomy is a traumatic procedure for every woman with breast cancer. According to the EORTC 10850 clinical trial, there is no difference between total and disease-free survival between tumorectomy and modified radical mastectomy, and BCS independently provides the benefit expected from surgery (11). In early stages, BCS and RT can be used in patients of all age groups using personalized techniques. RT can be sufficient in a shorter time because of the new technology; it can be partially performed in some patients and can be provided as a single-dose intraoperative RT (IORT) in some others (11,12). Studies on adjuvant therapy in older women showed that a combination of tumorectomy+tamoxifen achieves equivalent results as BCS + RT in terms of time to distant progression (12,13). In a study, patients who had undergone BCS without RT were followed up for 10 years and local recurrence rates in elderly women with early breast cancer was reported to be low enough to be neglected, i.e., it was reported that mastectomy may not be necessary even if RT had not been performed. Considering possible additional diseases in elderly women, short-term and limited RT application was shown to be effective. In these cases, it is understood that mastectomy does not provide better survival. IORT can be performed in some selected patients who underwent BCS; therefore, adequate and effective treatment is provided in a short time (13).

In this study, the rate of BCS performed in patients was found to be inversely proportional to tumor diameter and age. In group A, patients with T1 were more frequent and the BCS ratio was 79%; in group B, patients with T2 were more frequent and the BCS ratio was 58%; in group C, patients with T2 were more frequent and the BCS ratio was 65%; and in group D, patients with T2 were more frequent with an average tumor diameter of 4 cm and BCS ratio was 15% , in groups B and C, the tumor size was approximately equal to 3.2 and 3.3 cm, respectively, but more patients in group C underwent BCS (Graphic 3). Additional health problems and personal circumstances (living alone and away from the center and reluctance to undergo RT) could be effective in this situation, and it was concluded that age alone was not the factor. In group C, two patients had a lesser chance of undergoing BCS because of breast-tumor ratio during the initial diagnosis; therefore, after NAC regression was determined, BCS+RT were administered. Furthermore, in group A, eight patients received NAC and six patients received intraoperative electron RT (IOERT); in group B, four patients received NAC and three patients received IOERT. In these patients, we did not encounter any age-related problems.

In older women who choose mastectomy to avoid adjuvant treatment or refused to undergo surgery, HT may be considered as an option alone or in combination with BCS, but the case should be chosen very carefully (14). It has been shown that HT, instead of RT, yields equivalent results in estrogen receptor (ER)-positive patients after BCS (15,16). This treatment option may also increase surgeons' and patients' choice of BCS. Endocrine therapy reduces the risk of ipsilateral or contralateral breast tumor recurrence in women with ER-positive breast cancer who are not suitable for surgery or refuse to undergo surgery. It can also be a treatment option in selected low-risk elderly patients. Although it is unlikely to be performed postoperatively after BCS, the likelihood of recurrence in appropriate patients who underwent HT alone is negligible (16,17). In our series, we used HT after excisional biopsy under local anesthesia in a total of four patients in group D, two patients who did not wish to undergo mastectomy and two patients who could not receive anesthesia because of additional health problems. The mean follow-up for our patients was

19 (3–38) months. During this time, no deaths were detected because of breast cancer, but making an interpretation based on this data would not be proper or sufficient.

In conclusıon, the number of aging population in our country as well as in the world has been increasing and life span is prolonged particularly in women. Breast cancer, which is a major public health problem, is also observed more frequently and is diagnosed relatively late in the elderly.

In the present study, the form of diagnosis and choice of surgery in the elderly with breast cancer were investigated and it was observed that the tumor diameter increases and the rate of early diagnosis and BCS decreases with increasing age. The disease has a better prognosis in patients who are diagnosed at an early stage, and BCS as a surgical method for the elderly with breast cancer was shown to provide advantages compared with mastectomy in terms of overall and disease-free survival.

The life expectancy of a 65-year-old healthy woman in our country is estimated to be >19 years, i.e., the life span has reached 85 years. Early diagnosis of breast cancer can only be achieved with regular radiological screening and allows early diagnosis for the next 10 years; thus, more successful treatment with minimally invasive methods, i.e., it provides a significant gain in total. According to this data, the screening program in our country, which is currently planned until 70 years of age, appears to be insufficient and should be continued until the age of 75 years. In the light of our current knowledge, the choice of surgical method and adjuvant treatment planning in elderly patients with breast cancer should be based on the overall situation of the patients rather than age alone. Taking into consideration the increase in the life span and advancements in the health conditions, personalized, current, and standardized treatment should be planned for patients in all age groups. BCS as a surgical method for treatment of breast cancer can be used more safely and independent of the age of the patient.

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RESEARCH

NEUROVASCULAR COMPRESSION OF THE VESTIBULOCOCHLEAR NERVE USING TEMPORAL MRI IN GERİATRİC PATIENTS WITH VERTIGO

Abstract

Introduction: This study aimed to assess the neurovascular compression of the vestibulocochlear nerve using temporal magnetic resonance imaging in geriatric patients with vertigo.

Materials and Method: This study included 92 patients with vertigo [50 (54.3%) women; mean age, 53.6±14.2 years (min–max, 20–84 years)] and 85 healthy volunteers [46 (54.1%) women; mean age, 52.2±15 years (min–max, 23–79 years)]. Individuals aged ≥65 years included 52 of 92 patients and 45 of 85 healthy volunteers. All participants underwent temporal magnetic resonance imaging to detect neurovascular compression of vestibulocochlear nerve.

Results: The presence of neurovascular compression was more prominent in geriatric patients with vertigo than in patients aged <65 years with vertigo (p=0.001). Compression was detected on one side of vestibulocochlear nerve in patients with vertigo (p=0.007). Vestibulocochlear nerve compression was more common ingeriatric patients than in non-geriatric patients.

Conclusion: The study results describe the role of neurovascular compression of vestibulocochlear nerve in elderly patients with episodic peripheral vertigoin whom other causes were excluded.

Key Words: Vertigo; Vestibulocochlear Nerve; Geriatrics; Magnetic Resonance Imaging

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ARAŞTIRMA

VERTİGOSU OLAN GERİATRİK HASTALARDA TEMPORAL MRG'DE VESTİBULOKOKLEAR SİNİRİN NÖROVASKÜLER KOMPRESYONU

Öz

Giriş: Bu çalışmada vertigo şikayeti olan geriatrik hastalarda, temporal manyetik rezonans görüntüleme kullanarak vestibülokohlear sinirin nörovasküler kompresyonunun değerlendirilmesi amaçlanmıştır.

Gereç ve Yöntem: Çalışmaya, vertigosu olan 92 hasta [50 (% 54.3) kadın; yaş ortalaması: 53.6±14.2 yaş (min-max, 20-84 yaş)] ve 85 sağlıklı gönüllü [46 (% 54.1) kadının yaş ortalaması 52.2±15 yaş (min-max, 23-79 yaş)] dahil edildi. Doksaniki hastadan 52'si ve 85 sağlıklı gönüllüden 45'i, ≥65 yaş bireylerden oluştu. Tüm katılımcılar vestibülokohlear sinir nörovasküler kompresyonunun saptanması amacıyla temporal manyetik rezonans görüntüleme ile değerlendirildi.

Bulgular: Nörovasküler kompresyon varlığı, vertigosu olan geriatrik hastalarda vertigosu olan <65 yaş hastalardan daha belirgindi (p=0.001). Vertigo hastalarında vestibülokohlear sinirin bir tarafında kompresyon tespit edildi (p=0.007). Vestibülokohlear sinir kompresyonu, geriatrik hastalarda geriatrik olmayan hastalara göre daha sıktı.

Sonuç: Çalışma sonuçları, diğer nedenlerin dışlandığı epizodik periferik vertigosu olan yaşlı hastalarda vestibülokoklear sinir nörovasküler kompresyonunun rolünü tanımlamaktadır.

Anahtar Sözcükler: Vertigo; Vestibülokoklear sinir; Geriatri; Manyetik rezonans görüntüleme



INTRODUCTION

Vertigo is a common complaint in geriatric patients and has significant negative impacts on the quality of life in this population (1,2). It may also contribute to fall-related fractures, which increase the need for nursing care, and eventually lead to death of the elderly (3). Several recent clinical and imaging studies have focussed on neurovascular compression of the vestibulocochlear nerve (VCN), which is defined as vestibular paroxysmia (VP) (4-6). Vestibular paroxysmia is an episodic peripheral vestibular disorder that leads to acute, short and recurrent attacks of vertigo and is responsive to anti-epileptics (7). Magnetic resonance imaging (MRI) with high-resolution three-dimensional (3D) T2-weighted sequencesis useful for demonstrating neurovascular compression in patients with VP (4,6,8).

Vascular variations present at birth may form curves and loops around the cranial nerves, leading to neurovascular compression owing to degenerative alterations during ageing (9, 10). No study describing the association between neurovascular compression of VCN and vertigo in geriatric patients was foundin the literature. Therefore, this study specifically assessed neurovascular compression of VCN using temporal MRI in geriatric patients with vertigo. We grouped patients with vertigo and healthy volunteers according to their age (<65 years and ≥65 years) and compared their MRI results with regard to the means of neurovascular compression of VCN. In patients in whom MRI revealed neurovascular compression of VCN, the age andanatomical site of the compression were compared.

MATERIALS AND METHOD

This study was approved by the institutional review board (decision number: 04012017-8) and all patients signed informed consent forms.

Patient Selection

Patients presenting with short durationepisodic peripheral vertigoand who underwent temporal MRI were included in this study. Patients with clinical and/or imaging findings of Ménière's disease, benign paroxysmal positional vertigo, labyrinthitis, vestibular neuritis, vestibular schwannoma, vertebrobasilar insufficiency and cervical spondylosis were excluded. Recent acoustic trauma, upper airway infection, history of migraine, use of ototoxic medications, stroke, malignancy, central nervous system disease, type 1 or 2 diabetes mellitus, hypertension and atherosclerotic diseasewere other exclusion criteria. Patients and age- and sex-matched healthy volunteers were evaluatedfor the presence of neurovascular compression of VCNusing temporal MRI.Cases in whichMRI revealed neurovascular compression of VCN, the age and anatomical site of the compression were compared.

The geriatric group included patients and healthy volunteers aged ≥65 years, whereas the non-geriatric group included participants aged <65 years. Subjects were divided into four groups. Group 1 comprised patients with vertigoaged ≥65 years (52 patients; mean age, 71.3±4.8 years). Group 2 comprisedpatients with vertigoaged <65 years (40 patients; mean age, 38.1±10.8 years). Group 3comprised healthy volunteers aged ≥65 years (45 patients; mean age, 69.3±3.5 years). Group 4 comprisedhealthy volunteers aged <65 years (40 patients; mean age, 38.2±9.7 years). Groups 1 and 2 formed the study groups, and groups 3 and 4 formed the control groups.

Imaging Technique

All scans were performed using the General Electric Signa 1.5-T MRI scanner (GE Medical systems, Milwaukee, WI, USA) with an eight-

channel head coil. The standard temporal MRI protocol included axial T2-weighted images of the whole brain (TR/TE, 4500–5500/100 ms; NEX, 2; section thickness, 5 mm; intersection spacing, 1.5 mm; matrix size, 352 × 352) and coronal and axial T1-weighted images of the cerebellopontine angle before and after intravenously administering a contrast material (TR/TE, 12/5 ms; NEX, 2; section thickness, 0.8 mm; intersection spacing, 0.4 mm; matrix size, 256 × 256, field of view, 200 × 200 mm). For high-resolution MR images of the internal acoustic canal (IAC), axial 3D fast imaging employing steady-state acquisition (3D-FIESTA) sequence was used, andthe scanning parameters were as follows: TR/TE, 5.5/2.1 ms; bandwidth, 244 Hz/px; section thickness, 0.8 mm; intersection spacing, 0.6 mm; matrix size, 256 × 256; NEX, 4; flip angle, 65°; field of view, 220× 220 mm.

Image Analysis

Imaging studies wereretrieved from the Picture Archiving and Communication System (Centricity PACS, GE Healthcare) and loaded onto a dedicated workstation with three 3MP high-resolution monitors (Barco, Inc., Kortrijk, Belgium). To visualise the path of VCN from the brain stem to IAC and to depict the neurovascular compression, sagittal, semi-sagittal and semi-coronal reconstructions were created from axial 3D-FIESTA images using the scanner console. The absence of a detectable cerebrospinal fluid plane between VCN and any neighbouring vessel was defined as neurovascular compression (8). All vessels that could be followed to their origin were anatomically classified (contrast-enhanced images were also evaluated when required). The anatomical site of the neurovascular compression was also evaluated. Compressions at IAC or near the porusacusticus were classified as peri-intrameatal, whereas those at the cerebellopontine angle cistern or near pons were classified as non-meatal.

Statistical Analysis

Results were analysedusing IBM SPSS Statistics Version 21.0 software for Windows (Armonk, New York, USA). Data were tested for normal distribution using the Kolmogorov–Smirnov test. Datawith continuous normal distributionsare described as means and standard deviations, and categorical variables are described by frequency. Comparisons between the groups were performed using the Kruskal–Wallis test for nonparametric variables with more than two groups. Chi-square testswere performed for categorical variables. Statistical significance was defined as $p < 0.05$.

RESULTS

Subjects

After excluding 23 patients (two patients had vestibular neuritis, two had Ménière's disease, four had vestibular schwannoma, six had diabetes mellitus, five had hypertension and/or atherosclerotic disease and four had severe cervical spondylosis and vertebrobasilar insufficiency), 92 patients [50 (54.3%) women; mean age 53.6±14.2 years (min–max, 20–84 years)] were included.The control group included 85 healthy volunteers [46 (54.1%) women; mean age,52.2±15 years (min–max, 23–79 years)] with no history of vertigo or vestibulardiseases. There was no significant difference between the study and control groups in terms of sex and age (p=0.42 and p=0.56, respectively).



MRI Results

Neurovascular compression

In the study groups (groups 1 and 2), 40 (43.5%) patients had neurovascular compression of VCN using temporal MRI, whereas neurovascular compression was absent in 52 patients (56.5%). In the control groups (groups 3 and 4), 24 (28.2%) had neurovascular compression of VCN, whereas neurovascular compression was absent in 61 (71.8%). There was a significant increase in neurovascular compression among elderly patients in the study group compared with that in the control group (p=0.001; Table 1). Among geriatric patients, vascular contact occurred in 58% of patients with vertigo versus 33% of patients without vertigo (p = 0.024)

Table 1. Anatomical sites of the neurovascular compression in the study and control groups.

Anatomical sites of the neurovascular compression on temporal MRI	Study group (n=92)		Control group (n=85)		p
	Group 1 n (%)	Group 2 n (%)	Group 3 n (%)	Group 4 n (%)	
Peri-intrameatal compression	18 (60%)	1 (10%)	5 (33.3%)	1 (11.1%)	0.007
Nonmeatal compression	12 (40%)	9 (90%)	10 (66.7%)	8 (88.9%)	

Table 2. Presence of neurovascular compression of the VCN on temporal MRI by groups.

Presence of neurovascular compression of the VCN on temporal MRI	Study group (n= 92)		Control group (n=85)		p
	Group 1 n (%)	Group 2 n (%)	Group 3 n (%)	Group 4 n (%)	
Present	30 (57.7%)	10 (25%)	15 (33.3%)	9 (22.5%)	0.001
Absent	22 (42.3%)	30 (75%)	30 (66.7%)	31 (77.5%)	

MRI: Magnetic resonance imaging
VCN: vestibulocochlear nerve

Anatomical site of neurovascular compression

The anatomical sites of neurovascular compression in the study and control groups are shown in Table 2. When temporal MRI revealed neurovascular compression, a comparison of the anatomical site of compression revealed a significant difference between the groups (p=0.007). Peri-intrameatal compression was more

common in geriatric patients in the study group than those in group 2 (60% and 10%, respectively; p=0.007).

Anatomical classification of compressing vessels

All vessels that could be followed to their origin were anatomically classified (contrast-enhanced images were also evaluated when required). Of 40 patients in whom MRI revealed neurovascular compression, 33 patients had arterial compression and the anterior inferior cerebellar artery (AICA) was the compressing vessel in 30 (75%) patients. In three patients the compressing vessels could not be differentiated as AICA or PICA definitely.

DISCUSSION

Neurovascular compression of VCN was more prominent in elderly patients with vertigo than inhealthy volunteers. Moreover, intrameatal compression was more prominent in elderly patients with vertigo compared with that in young patients with vertigo. Therefore, our study supports the hypothesis that variations in AICA and the posterior inferior cerebral artery branchespresent at birthlead to neurovascular compression because of degenerative alterations during ageing (9,10). To the best of our knowledge, this study is the first to describe the association between neurovascular compression of VCN and vertigo in geriatric patients.

According to the Global Health and Aging report of the World Health Organization, population ageing will continue and even acceleratebecause of the remarkable increases in life expectancy and decreasing fertility rates (11). The number of people aged>65 years willbemore than double, from 524 million in 2010 to nearly 1.5 billion in 2050, with most of the increase occurring in developing countries.

Vertigo, the sensation of motion in the absence of motion relative to Earth's gravity, is a complaintof approximately 30% of geriatric patients (12,13). Consequences of vertigo include postural instability, limitations in daily activities and social participation and fall-related injuries and fractures, and it represents an important public healthcare issue (14-17). Given its significant prevalence and negative effects in the elderly, vertigo deserves special attention, particularly with accelerating growth in the elderly population worldwide.

Vestibular paroxysmia, which is caused by neurovascular compression of VCN, leads to spontaneous, paroxysmal and short attacks of vertigowith or without auditory and vegetative symptoms (18). Vestibular paroxysmia accounts for 4% ofvertigo and balance disorders and may be effectively treated with low-dose sodium channel-blocking anti-epileptics such as carbamazepine. Surgical decompression should be reserved for refractory cases (7).

Temporal MRI, including high-resolution 3D T2-weighted sequences such as 3D-FIESTA, revealsneurovascular compression by providing an accurate visualisation of the cisternal and intracanalicularportion of VCN, as shown in recent studies (8, 19). Neurovascular contacts are frequent MRI findings in asymptomatic patients. However, the type of compressing vessel and the anatomical site of the compression are the two main factors that determine whetherneurovascular contacts become symptomatic. Accordingly, neurovascular compressions are most likely to cause symptoms when they are located at IAC or near the porus acusticus, also known as the transitional zone, which corresponds to this anatomical site of the nervebetween the central and peripheral myelin and is the most vulnerable part of VCN. Compressing vessels most likely to cause symptoms are arteries because of stronger pulsations (6,8). In contrast, De Ridder et al. (20) reported that compression causes symptoms only when contact occurs along the central nervous system segment of the nerve, which is the portion between the brainstem and root entry–exit zone. We found that peri-intrameatal

compressions were more prominent in elderly patients with vertigo than in young patients. The majority of compressions in patients with vertigo were arterial, andAICA was the compressing vessel in 75% of cases.

Many referring physicians, including otorhinolaryngologists,neurologists,neurosurgeons and radiologists, disregard VP in the differential diagnosis of vertigo. This may be because of the unclear clinical diagnostic criteria and frequent MRI findings of neurovascular compressions in asymptomatic individuals. Nevertheless, recent studies have clarified theclinical and radiological diagnostic criteria of VP. In addition, anti-epileptics such as carbamazepine are reportedly highly effective in most patients with VP (5,18). Thus, both clinicians and radiologists should consider VP while evaluating geriatric patients with vertigo. To exclude VP in such patients, temporal MRI with high-resolution 3D T2-weighted sequences such as 3D-FIESTA should be implemented.

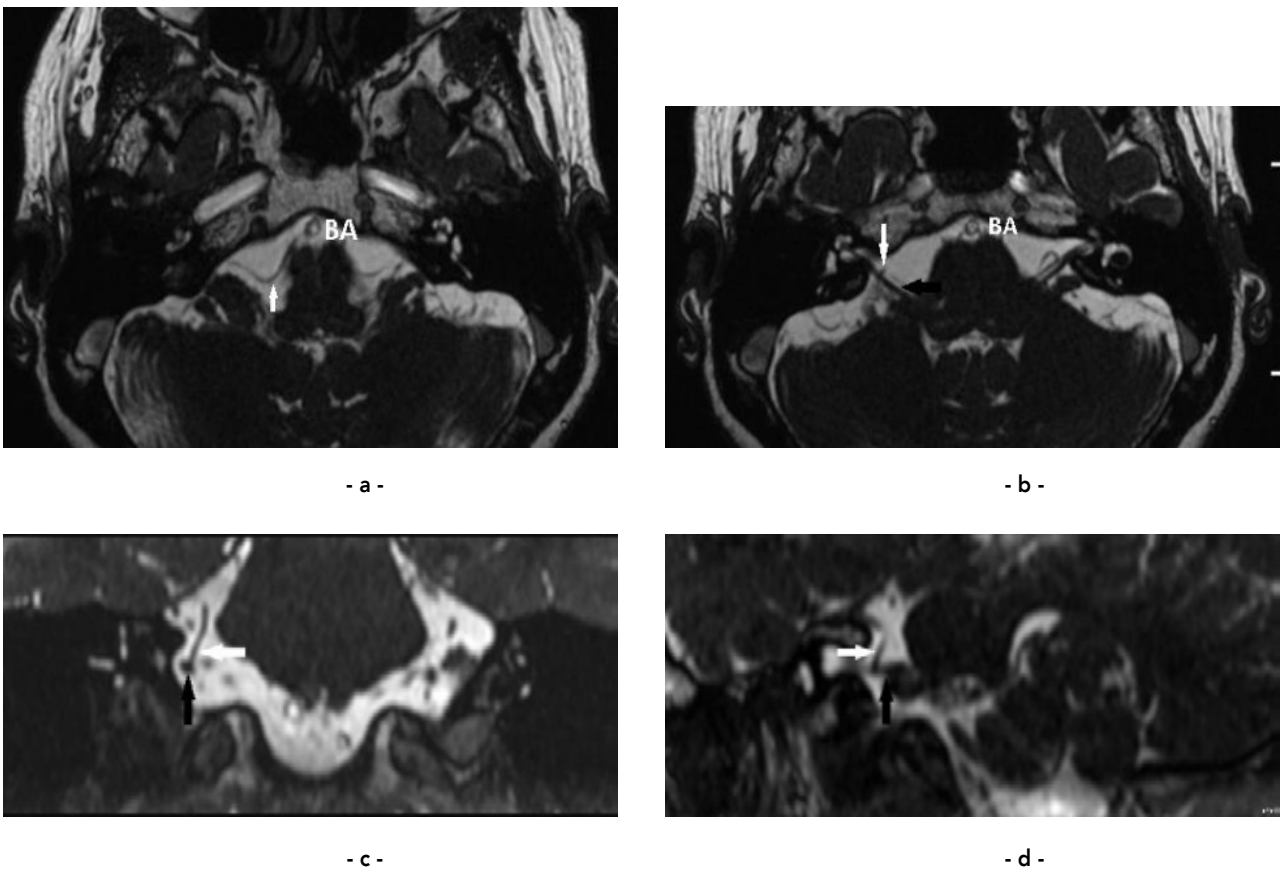


Figure 1. Neurovascular compression of the vestibulocochlear nerve (VCN) in a 72-year- old woman with vertigo. Axial (a, b), coronal (c) and sagittal (d) reformatted 3D-FIESTA images show the neurovascular compression of right VCN (black arrows) by right anterior inferior cerebellar artery (AICA) (white arrows) originating from basilar artery (BA). Note the indentation of VCN by tortuous AICA.

There are some limitations to our study. First, it was a single-centreretrospective study. Second, before this study, patients were not evaluated on the basis of strict clinical or radiological diagnostic criteria of VP. Furthermore, their medical therapy and response totherapy were not considered. This study excluded cases of vertigo that occurred because of any other causes based on clinical and/or imaging findings. We also excluded patients with vascular diseases and related risk factors such as diabetes mellitus, hypertension and atherosclerotic diseases. Although there were no definitive studies on VP before this one, we believethat most patients with vertigo, particularly geriatric patients, have VP. This study may serve as a starting point for developing a prospective study in cases whereincontrolling clinical variables would enable us to make useful conclusions.

In conclusion, we evaluated neurovascular compression of VCN using MRI in geriatric patients with vertigo. The study results highlight the role of neurovascular compression of VCN in elderly patients with vertigo in whom other causes were excluded. Vestibular paroxysmia should be considered in the differential diagnosis of every vertigo case, and temporal MRI, including high-resolution 3D T2-weighted sequences, should be performed, particularly in geriatric patients with vertigo.

Conflict of Interest

The authors have no conflict of interest to declare.

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RESEARCH

HERPES ZOSTER IN GERIATRIC PATIENTS: CLINICAL COURSE AND COMPLICATIONS

Abstract

Introduction: Herpes Zoster is a skin disease which occurs following the reactivation of varicella zoster virus. Our aim was to investigate the incidence, clinical course and complications of herpes zoster in a geriatric population.

Materials and Method: Geriatric patients with the diagnosis of herpes zoster who admitted to our outpatient clinic during one-year period were recruited to this study. The incidence of patients with herpes zoster was calculated among all patients who admitted to our outpatient clinic. Additionally; age, gender, the presence and duration of prodromal pain, potential triggering factors and complications were noted. The severity of pain was measured with the Visual Analogue Scale.

Results: In total, 3386 geriatric patients were admitted to our dermatology outpatient clinic over the one-year period. Of these, 53 patients (1.56%) were diagnosed with herpes zoster. The highest frequency of herpes zoster was detected in July (3.31%), whereas the lowest frequency was detected in October (0.40%). Prodromal pain was observed in 28 patients (52.8%). The mean Visual Analogue Scale score was 5.98±2.71. There were triggering factors in 41 patients (77.4%). Complications of herpes zoster occurred in seven patients (13.2%). Visual Analogue Scale scores were significantly higher in patients who had prodromal pain ($p<0.05$).

Conclusion: The presence of prodromal pain in geriatric patients may be highlighted that the disease will be continued with severe pain.

Key Words: Herpes zoster; Geriatrics; Aged

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ARAŞTIRMA

GERİATRİK HASTALARDA HERPES ZOSTER: KLİNİK SEYİR VE KOMPLİKASYONLAR

Öz

Giriş: Herpes Zoster, varisella zoster virüsün reaktivasyonuyla ortaya çıkan bir deri hastalığıdır. Bizim amacımız, geriatrik hastalarda herpes zosterin insidansını, klinik seyrini ve komplikasyonlarını incelemekti.

Gereç ve Yöntem: Bir yıl içerisinde dermatoloji polikliniğine başvuran herpes zoster tanılı geriatrik hastalar çalışmaya alındı. Dermatoloji polikliniğine başvuran geriatrik hastalar içerisinde herpes zosterli olguların insidansı hesaplandı. Ayrıca yaş, cinsiyet, prodromal ağrı varlığı ve süresi, potansiyel tetikleyici faktör ve komplikasyonlar kaydedildi. Ağrı şiddeti Görsel Analog Skala ile değerlendirildi.

Bulgular: Bir yıl süresince dermatoloji polikliniğine 3386 geriatrik hasta başvurdu. Bu hastaların 53'ü (%1.56) herpes zoster tanısı aldı. En yüksek herpes zoster yüzdesi (%3.31) Temmuz ayında saptanırken, en düşük yüzde (0.40%) Ekim ayında saptandı. Yirmi sekiz hastada (%52.8) prodromal ağrı saptandı. Hastaların ortalama Görsel Analog Skala skoru 5.98±2.71 idi. 41 hastada (%77.4) tetikleyici faktör mevcuttu. Herpes zostere bağlı komplikasyon yedi hastada (%13.2) gelişti. Prodromal ağrısı olan hastaların Görsel Analog Skala skorları istatistiksel olarak anlamlı düzeyde yüksek tespit edildi ($p<0.05$).

Sonuç: Herpes zosterli geriatrik hastalarda prodromal ağrının varlığı, hastalığın şiddetli ağrı ile seyredeceğine işaret edebilir.

Anahtar Sözcükler: Herpes Zoster, Geriatri, Yaşlı

INTRODUCTION

Herpes Zoster (HZ) is a skin disease developed due to reactivation of varicella zoster virus (VZV) that remained dormant within dorsal root ganglia, often decades after initial exposure to the virus in the form of varicella (chickenpox) (1). In this disease lesions spread dermatomally. Characteristic lesions begin as erythematous, maculopapular lesions that progress into painful vesicular lesions (2). Patients with haematological malignancies, such as those Hodgkin lymphoma, non-Hodgkin lymphoma and chronic lymphocytic leukemia and patient with acquired immunodeficiency syndrome (AIDS), those receiving immunosuppressive therapies and the elderly, have an increased risk for the development of HZ (2,3). Geriatric patients are particularly prone to the development of HZ due to an immunological dysfunction at the cellular level. The number and function of T-cell responders to VZV tend to decrease with age (2). Extensive literature review revealed a distinct lack of prospective studies related to HZ in geriatric patients in Turkey to us.

This study aimed to to investigate the incidence of HZ, and observe the clinical course and complications of this disease in a geriatric population admitted to our dermatology outpatient clinic.

MATERIALS AND METHOD

Patients older than 65 years of age who admitted to our dermatology outpatient clinic with the diagnosis of HZ were included in this study prospectively between October 2015-November 2016. Age, gender, the month of the admission to the hospital, accompanying systemic diseases, alcohol intake, smoking habits, the presence and duration of prodromal pain, characteristics of pain/ pruritus, the time between the onset of skin lesions and hospital admission, possible triggering factors, presence and duration of prodromal pain, use of antiviral therapy and number of HZ attacks were recorded. The localization of the lesions and affected dermatome were determined. The severity of pain was measured and scored by Visuel Analog Scale (VAS). VAS is used to convert some numerically unmeasured values into numeric values. A 100-milimater horizontal line is drawn for evaluation and the end definition of the parameters (0 and 10) are written two ends of horizontal line. The patient is asked to mark this horizontal line at the point where it the symptom is appropriate. Meaning of "0" is no pain and meaning of "10" is most severe pain. (4).

All patients with HZ were followed up for potential complications of the disease. Statistical correlations between VAS and uppermentioned demographic and clinical variables were evaluated. The local ethic committee approval was obtained. (date: 04.08.2015 number: 538). The written informed consent forms were taken from the patients.

The Number Cruncher Statistical System (NCSS) 2007 (Kaysville, Utah, USA) was used for all statistical analyses and $p<0.05$ was accepted as statistically significant.

RESULTS

In total, 3386 geriatric patients were admitted to our dermatology outpatients' clinic within a one-year period. Of these, 53 patients (1.56%) were diagnosed with HZ. Twenty-two patients (41.5%) were male and 31 (58.5%) were female. Mean age of patients with HZ was 72.92±6.46 years (Range: 65–96).46 patients (86.2%) had one or more accompanying systemic diseases. The most common accompanying systemic disease was hypertension, followed by diabetes mellitus and coronary artery disease.

Six patients (11.3 %) were smokers, and seven patients (13.2 %) were ex-smokers. Only one patient (1.9%) had an alcohol habit. The highest number of HZ patients (11 patients, 2.26%) were admitted in January, and the lowest number in September (1 patient, 1.9%) and October (1 patient, 1.9%). However, the highest incidence was detected in July (3.31%) and the lowest incidence was detected in October (0.40%). Distribution of the number of patients with HZ and the incidence of HZ are shown in Graphic 1.

Prodromal pain was observed in 28 patients (52.8%). The mean duration of prodromal pain was 7.54±7.78 days (Range: 1 day–30 days). The mean VAS score was 5.98±2.71. Pain and/or pruritus were observed in 51 patients (96.2%). Only two patients (3.8%) had no symptoms.

The time between onset of skin lesions and the time of admission was 4.47±4.67days (1-30 days). Twenty-eight patients (52.7%) reported clear triggering factors, such as emotional stress (28 patients, 52.7%), infections (8 patients, 15.2%), malignancy (3, patients, 5.7%), history of surgery (1 patient, 1.9%) and history of dental surgery (1 patient, 1.9%). Forty-nine patients (92.5%) had first attack of HZ, four patients (7.5%) had second attack of HZ.

In total, 43 patients (81.1%) had taken systemic antiviral therapy. Complications due to HZ occurred in only seven patients (13.2%). Of those three patients had ocular involvement, three patients had post-herpetic neuralgia and one patient had segmental zoster paresis on the second and third fingers of the left hand. (Table 1). Lesions occurred in the thoracic dermatomes in 37 patients (69.6%), cervical dermatomes in 10 patients (19%), lumbal dermatomes in 5 patients (9.5%) and lumbo-sacral dermatoms in 1 patient (1.9%). Furthermore, lesions detected on the right side of the body in 28 patients (52.8%) and on the left side in 25 patients (47.2%).

Table 1. Distribution of complications of HZ in geriatric patient.

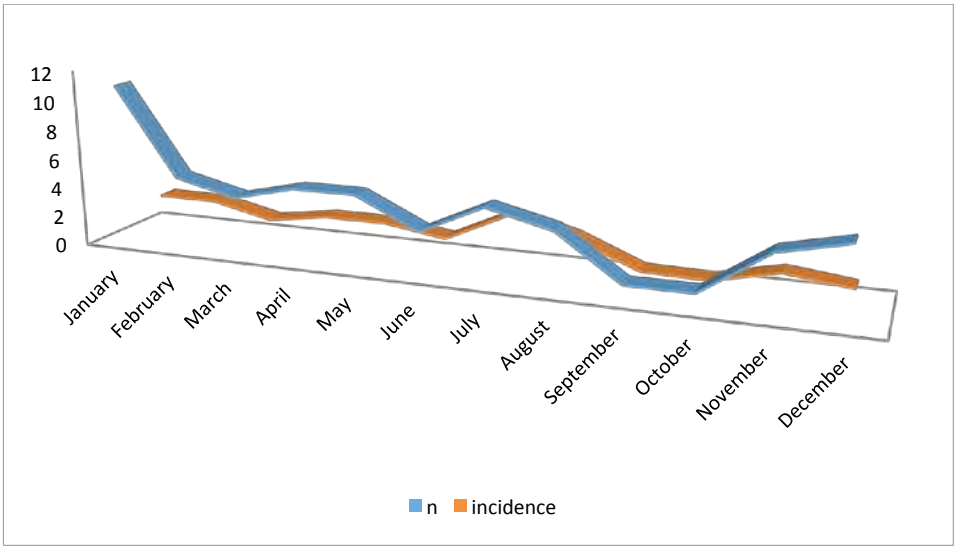
Complications of HZ	Number of Patient (%)
Ovular involvement	3
Post-herpetic neuralgia	3
Segmental zoster paresis	1

HZ:Herpes Zoster

VAS was significantly higher in patients who had prodromal pain ($p<0.05$; Table 2).

VAS scores showed a significant and negative correlation with the duration between the onset of skin lesions and hospital admission (r: −0.411, $p=0.002$).

There was no statistically significant relationship between VAS and gender, age or duration of prodromal pain ($p>0.05$). Furthermore, there was no significant relationship between VAS and smoking habits or the presence of a triggering factor ($p>0.05$).



Graphic 1. Distribution of number of patientswith HZ andincidence of HZ

n: Number of patient

Table 2. Relationshipbetween VAS andgender, smokinghabit, triggeringfactor, andprodromalpain

		VAS	p
Gender	Male	5.54±2.99	0.434[a]
	Female	6.29±2.50	
Smokinghabit	Absence	6.00±2.87	0.164[b]
	Presence	4.50±1.76	
	Exuser	7.14±1.95	
TriggeringFactor	Absence	5.75±3.19	0.864[a]
	Presence	6.05±2.60	
ProdromalPain	Absence	5.12±2.85	**0.028[a]**
	Presence	6.75±2.38	

aMannWhitney U Test bKruskall Wallis Test

DISCUSSION

Infection with VZV presents as two distinct entities: chickenpox as a primary infection and HZ as a secondary condition. Following VZV reactivation in the dorsal ganglia, HZ lesions begin to develop on the corresponding dermatomes of the involved ganglia. Lesions begin as maculopapules and progress to vesicles. HZ is more common in older patients, the incidence of the disease in patients older than 65 years of age is more than 1% (5). In our present

study, the incidence of HZ among geriatric patients in our dermatology outpatient clinic was 1.56%.

It is reported that HZ does not show a seasonal prevalance unlike varicella zoster, HZ appears sporadically throughout the year. (6). The frequency of HZ can vary throughout the year. For example, Küçükçakır et al. showed that HZ was most commonly encountered in January and August (7). In our study, we detected that most patients with HZ were admitted in January however the incidence was highest in July. Our study also showed a high incidence of HZ during August, which concurs with the existing literature. In another study, Karakoca et al. showed that number of patients attending to a dermatology outpatient clinic because of HZ was higher in April and November in Turkey (8).

Most patients with HZ experience prodromal pain, or abnormal sensation in the involved dermatome prior to the appearance of the characteristic skin lesions. Prodromal pain can last for several days; in one study, the duration of prodromal pain varied from 7 days to 100 days (3). The cause of prodromal pain may be due to viral degeneration of nerves (9). Goh et al. revealed that prodromal pain was observed in 42% of patients with HZ older than 50 years of age HZ. The incidence of prodromal pain was lower in younger patients (10). In our present study, 28 patients (52.8%) experienced prodromal pain, and mean duration of prodromal pain was 7.54±7.78 days (Range: 1 day–30 days). VAS scores were significantly higher in patients who experienced prodromal pain. Increase of perception of pain due to HZ in geriatric patients can be due to increment of neural degeneration with ageing.

In our study, we found that the time between onset of skin lesions and hospital admission ranged from 1 to 30 days, with a mean of 4.47±4.67days. Rozenek et al found that the time between appearance of skin lesions and diagnosis of the disease was 1-3 days in 53% of cases. In the same study, they found that 91% of patients received systemic antiviral treatment (11). It was 81.1% in our study. It may be due to late admission of patients to the hospital in the present study.

Immunosuppression, malignancy, ageing, emotional stress are known risk factors for HZ (12). In our study, we found some triggering factors in addition to ageing in 52.7% of patients. Emotional stress and infection were the most common triggering factors in this study. Physical trauma to the affected dermatome is other risk factor for HZ (5). In our study one patient (1.9%) had history of surgery and one patient (1.9) had history of dental operation on the affected dermatomes.

The incidence of complications associated with HZ increases with ageing. For example, the rate of post-herpetic neuralgia (PHN) is known to be higher in elderly patients (5).PHN develops in approximately 10%–18% of patients with HZ and ocular involvement has been observed in 10%–15% of patients with HZ (13). In the present study, seven patients (13.2%) had some complications. Most common complication was PHN and then ocular involvement. One of the patients developed segmental zoster paresis. In a previous study, they found that PNH was the most common complication of HZ in elderly as well (7).

HZ most commonly located in thoracic dermatomes (4). Similarly, we detected thoracic dermatomal involvement in 37 patients (69.6%).

In conclusion, we found that ageing in itself is a risk factor for the development of HZ. Additional triggering factors, such as emotional stressor and infection can lead to development of HZ in geriatric populations. Lesions usually occur in the thoracic dermatomes and on the right side of the body. The incidence of HZ in the geriatric population was higher in the summer months. The presence of prodromal pain highlighted the possibility of severe pain in elderly patients. VAS scores, which represent a measure of pain severity, are not affected by age, the duration of pain, or lift style habits such as alcohol and smoking. Finally, our data showed



that the most common complication of HZ in our geriatric population was PHN.

Consequently, geriatricians and dermatologists should take appropriate measures to manage this disease and consider that the presence of prodromal pain in elderly patients with HZ is associated with severe pain.

Conflict of Interest

The authors have no conflict of interest to declare.

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RESEARCH

EFFECT OF AGING ON TEMPORAL RESOLUTION

Abstract

Introduction: The aim of the present study was to evaluate the changes in temporal resolution with aging and the effects of these age-related changes on speech recognition performance.

Materials and Method: 30 young adults with normal-hearing (aged 18 to 30 years) and 25 elderly adults with normal-hearing (aged 60 to 80 years), a total of 55 participants, were included in the study. For each subject, Gaps in Noise Test, Acceptable Noise Level test and Speech Recognition Tests were carried out. Results: No significant difference was observed between the groups in terms of Most Comfortable Level, Background Noise Level and Acceptable Noise Level while there were significant differences in terms of Gaps in Noise threshold, Total Percentage Score and Speech Recognition Scores (p=0.0001). The elderly group had a significantly higher Gaps in Noise threshold and lower Total Percentage Score compared to the younger group. Also, the mean score of speech recognition in the elderly group under all conditions was significantly lower than the younger group (p=0.0001).

Conclusion: The present study showed that temporal resolution decreases with aging and that this reduction in temporal resolution is only one of the underlying reasons of speech recognition difficulties in elderly people and it is concluded that the gaps-in-noise test is a fast and appropriate test for assessing temporal resolution in both young and elderly individuals.

Key Words: Aging; Auditory perception; Speech perception; Time perception

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ARAŞTIRMA

YAŞLANMANIN TEMPORAL ÇÖZÜNÜRLÜK ÜZERİNDEKİ ETKİSİ

Öz

Giriş: Bu çalışmada yaşlanmayla birlikte temporal çözünürlükte meydana gelen değişiklikler ve bu değişikliklerin konuşmayı ayırt etme performansı üzerindeki etkilerini değerlendirmek amaçlanmıştır.

Gereç ve Yöntem: Çalışmaya normal işiten 18-30 yaşları arası 30 genç yetişkin ve 60-80 yaşları arası 25 yaşlı yetişkin olmak üzere toplam 55 katılımcı dahil edilmiş, her birine Gürültüde Boşluk Tanıma Testi, Kabul Edilebilir Gürültü Seviyesi Testi ve Konuşma Testleri uygulanmıştır.

Bulgular: Gruplar arasında En Rahat Dinleme Seviyesi, Arka Plan Gürültü Seviyesi ve Kabul Edilebilir Gürültü Seviyesi bakımından anlamlı fark elde edilmezken; Gürültüde Boşluk Tanıma eşiği, Doğru Boşluk Tanıma oranı ve konuşmayı ayırt etme puanları bakımından anlamlı farklar elde edilmiştir (p=0.0001). Yaşlı grupta Gürültüde Boşluk Tanıma eşiği ortalaması genç gruba göre yüksek, Doğru Boşluk Tanıma oranı ortalaması ise istatistiksel olarak düşük elde edilmiştir (p=0.0001). Tüm dinleme koşullarında konuşmayı ayırt etme puanı ortalamaları yaşlı grupta genç gruba göre istatistiksel olarak düşük elde edilmiştir (p=0.0001).

Sonuç: Çalışma sonunda yaşlanma ile beraber işitsel temporal çözünürlüğün azaldığı, bu azalmaların yaşlılardaki konuşmayı ayırt etme güçlüklerinin altında yatan nedenlerden sadece biri olduğu ve gürültüde boşluk tanıma testinin genç ve yaşlı bireylerde temporal çözünürlüğü değerlendirilmek üzere kullanılabilir hızlı ve uygun bir test olduğu sonucuna varılmıştır.

Anahtar Sözcükler: Yaşlanma; İşitsel algı; Konuşma algısı; Zaman algısı



INTRODUCTION

As adults age, some anatomical and physiological deteriorations occur within the auditory system. Age-related reductions in pure tone hearing sensitivity are the most common sensory deficit in the elderly (1,2). Many studies have reported that hearing thresholds decline with age, predominantly in the high frequencies (3,4). Such decline might have some major adverse effects upon communication, particularly in noisy and reverberant listening situations. Previous studies have suggested that older listeners are associated with poorer performance in speech understanding tasks than young listeners and findings from these studies suggested that age-related declines in hearing sensitivity are the primary cause of discrimination problems in older listeners (5,6). On the other hand, Vermeire et al. suggested that speech understanding correlates more with age than with hearing (7). Although similar studies (8,9) report that speech recognition by older subjects is worse than that of younger subjects by an even greater margin than expected considering the degree of hearing loss, a finding partially supported by the findings of Vermeire et al., there is still no consensus with regards to the effects of age-related factors upon speech discrimination. Age-related central processing changes have also been attributed to speech understanding difficulties in older listeners. To understand speech, a listener must be able to resolve specific temporal cues of the speech sound; therefore, temporal resolution is thought to be very important for the accurate understanding of speech. While there have been many studies reporting that temporal resolution declines with age (10,11) other studies suggest that this decline does not correlate with age (7,12). Consequently, there is significant confusion relating to the effects of age upon temporal resolution ability. Therefore, in the present study we assessed temporal resolution, and carry out a number of investigations in respect to speech recognition, age, and temporal resolution. First, The Gaps in Noise Test (GIN) was used to determine and compare temporal resolution performance between young and elderly subjects. Next, it was investigated to what extent speech recognition performance changed in young and elderly individuals at various signal-to-noise ratios and whether temporal resolution ability had an effect upon speech recognition performance. It was also evaluated the degree of correlation between aging and both temporal resolution and speech recognition performance in all subjects. Finally, it was investigated whether the Acceptable Noise Level (ANL) is effective in speech recognition performance in noise.

MATERIALS AND METHOD

30 Thirty young adults aged 18 to 30 years (female: 13; male: 17; mean age 25.16 years, standard deviation ±3.25 years) and 25 elderly adults aged 60 to 80 years (female:14; male:11; mean age: 68.04 years±5.55 years), a total of 55 participants, were included in the study. All participants had normal hearing defined as pure tone thresholds≤25 dB HL at 500, 1000 Hz and≤35 hearing dB HL at 2000 and 4000 Hz. Considering the pure tone averages of 500, 1000, 2000, and 4000 Hz in the best hearing ears of the participants, the pure tone mean of the four frequencies were calculated as 7.62±4.80 dB HL in the younger group and 13.26±8.08 dB HL in the elderly group. Additional criteria for subject selection included normal middle-ear function as determined by acoustic immittance testing and the lack of any known otological, neurological, cognitive, or learning deficits.

The study was done with the approval of Marmara University Health Sciences Institute Clinical Studies Ethics Committee (30/05/2017- 26) and informed consent was obtained from all participants.

Gaps in Noise (GIN), Acceptable Noise Level (ANL) and speech tests were administered to each participant. All tests were performed in sound-treated booths with an ambient noise level,

measured by a sound level meter, below 30 dB (A) SPL. The subjects were tested while seated in a comfortable armchair, at 0□ azimuth and one meter away from loudspeaker. All test stimuli were calibrated with a sound level meter by taking a 1000 Hz probe tone as a reference in the free field.

Monosyllabic Word lists that were used for speech recognition test and the speech samples that were used for ANL test were recorded in a professional audio recording studio. Waveform Audio File Format (Wav) was used as the recording and playback format. All speech samples were recorded by a female talker in a 2.5x3x2.5 meter room which was treated acoustically. The carrier phrase was used before the each speech recognition test word. While recording, the microphone was positioned at a distance of 15 centimeters from the mouth of the speaker and at an angle of 45 degrees. Post-recording normalization was performed for each part.

Procedures

a. GIN Test: There are four different tests lists that were developed to be used in the GIN test. The lists contain 60 gaps which are 2, 3, 4, 5, 6, 8, 10, 12, 15 and 20 msec in duration and each is put in order six times and randomly. The number of these gaps embedded within white noise segments of 6 msec varied between 0-3 and the interstimulus interval (segments) is 5 secs. The GIN stimuli which were recorded on a compact disc played through a calibrated audiometer and presented through a loudspeaker at a level of 60 dB SPL. The lists, selected at random, were administered each subject. All subjects were given practice items before the test to ensure the task was understood. They were instructed to press the response button in their hands as soon as they heard any small gap in noise. If the response button was pressed during the gap, it was counted as positive. If the button was not pressed when a gap occurred, it was counted as an error. If the button was pressed when no gap occurred, it was counted as false positive. At the end of the test, the GIN threshold and Total Percentage Score (TPS) were determined (13).

b. ANL Test: Acceptable Noise Level (ANL) is an adaptive measure, to quantify listeners' willingness to listen to speech in the presence of a background noise. Fundamental aspect of this measure is that subjects can self-select their acceptable level of background noise. ANL was determined using recorded speech sample as the primary stimulus and speech noise as the competing background noise. For the ANL procedure, the subjects were given two handheld buttons to adjust the volume up or down in 2 dB steps. First, subjects were instructed to adjust the intensity level of the speech sample to their most comfortable listening level. Next, background noise was added and the subjects were instructed to adjust its level to the highest level where they could easily understand the speech without becoming tense or tired. This level is called the background noise level (BNL). Finally, the ANL was calculated as the difference between the MCL and BNL.

c. Speech Tests: Phonemically balanced Turkish monosyllabic word recognition lists for adults, which were developed as 6 different sets of 25 words, were used to evaluate speech recognition performance (14). Speech Recognition Scores (SRS) were administered in three different conditions and a different word list was used for each condition to avoid the adaptation. Test conditions were (1) Signal at 60 dB SPL, no noise (S60-N0), (2) Signal at 60 dB SPL, speech noise at 60 dB SPL (S60- N60), and (3) Signal at MCL, speech noise at BNL (SMCL-NBNL), respectively.

Statistical Methods

Statistical analyses were performed using the SPSS software version 20 (Chicago, IL, USA). The variables were investigated using visual (histograms, probability plots) and analytical method (Kolmogorov-Simirnov) to determine whether or not they are normally disturbed. Descriptive



analyses were presented using means and standard deviations for normally distributed variables.

Statistical analysis was conducted in four parts. First, independent samples t test was used to test the significance of the differences between the groups. Second, paired-samples t test was used to test the significance of the difference between three dependent variables in each group. Third, Pearson's Correlation Coefficients was used to examine the relationship between SRS and three different variables (ANL, GIN thresholds and TPS) for both young and elderly groups. Fourth, effect of age on SRS, GIN threshold, TPS and ANL was also analyzed with correlation coefficient for all subjects. A p value of <0.01 was accepted as the level of significance for all statistical analysis.

RESULTS

GIN Test

The mean GIN threshold was 6.20 msec in the elderly group, compared to 2.86 msec in the younger group. This difference was statistically significant (Table 1). TPS was significantly higher in the younger group (92.7%) compared to the elderly group (76.1%, Table 1). In both groups, GIN threshold and TPS were observed to show a strong negative correlation (r = -0.865).

Speech Test

There was a significant difference in terms of SRS between the two groups for all listening conditions. The mean values for both groups are presented in Table 1. In the young group, the SRS obtained in three different listening conditions were observed to show statistically significant differences with from each other (Table 2). In the elderly group, a significant difference was found between SRS obtained in quiet conditions and in both noise conditions. However, there was no significant difference between SRS obtained in both noise conditions (Table 2).

ANL Test

We did not identify any statistically significant differences in terms of MCL, BNL and ANL values across the groups (Table 1).

The Relationship between GIN Scores and SRS

In the young group, there was no significant correlation between GIN scores and SRS obtained in any of the three listening conditions (Table 3).

In the elderly group, no significant correlation was detected between GIN results and SRS obtained in quiet conditions. Ho wever, a weak negative correlation was found between SRS obtained in both noise conditions and GIN threshold, and a weak positive correlation with TPS (Table 3).

The Relationship between ANL and SRS

In the young group, there was a weak correlation between SRS obtained in condition in which speech was presented only as MCL and noise was presented as BNL. No significant correlation was found between ANL scores and the SRS obtained for other listening conditions (Table 3). In the elderly group, there was no significant correlation between ANL and the SRS obtained for all three listening conditions (Table 3).

The Effect of Age upon Variables

In the study, it was also examined whether there was an age effect on speech recognition performance, temporal resolution performance and ANL by using correlation coefficients, including both groups between the ages of 18-80 years.

Speech tests: A weak negative correlation was found between age and SRS obtained in quiet condition. However, a moderate negative correlation was found between age and SRS obtained in both noise conditions (Table 4).

GIN test: A moderate positive correlation was found between age and GIN threshold, and a moderate negative correlation between age and TPS (Table 4).

ANL test: No significant correlation was found between age and ANL (Table 4).

Table 1. Comparison of mean values for SRS, MCL, BNL, ANL, GIN Threshold and TPS between young and elderly groups.

	Group	N	Mean	Std. Dev.	Mean Dif.	p	t
S60–N0 SRS (%)	Young Elderly	30 25	98.13 95.20	2.92 4.61	2.93	0.006*	2.86
S60-N60 SRS (%)	Young Elderly	30 25	88.46 78.88	5.79 11.74	9.58	0.001*	3.72
SMCL-NBNL SRS (%)	Young Elderly	30 25	93.06 82.24	7.92 10.07	10.82	0.0001*	4.36
MCL (dB HL)	Young Elderly	30 25	61.96 61.68	4.21 4.42	0.28	0.807	0.24
BNL (dB HL)	Young Elderly	30 25	61.3 59.44	4.99 4.77	1.86	0.166	1.40
ANL (dB HL)	Young Elderly	30 25	0.7 2.24	3.06 2.65	-1.54	0.054	-1.97
GIN Threshold (msec)	Young Elderly	30 25	2.86 6.20	1.16 3.14	-3.34	0.0001*	-4.93
TPS (%)	Young Elderly	30 25	92.7 76.12	6.25 13.61	16.58	0.0001*	5.61

Table 2. Differences of SRS obtained from three different listening conditions in the young and elderly groups.

		N	Mean	Std. Dev.	Sig (2-tailed)
Young Group	**S60-N0 S60-N60**	30 30	98.13 88.46	2.92 5.79	0.000*
	S60-N0 SMCL-NBNL	30 30	98.13 93.06	2.92 7.92	0.005*
	S60-N60 SMCL-NBNL	30 30	88.46 93.06	5.79 7.92	0.008*
Elderly Group	**S60-N0 S60-N60**	25 25	95.20 78.88	4.61 11.74	0.000*
	S60-N0 SMCL-NBNL	25 25	95.20 82.24	4.61 10.07	0.000*
	S60-N60 SMCL-NBNL	25 25	78.88 82.24	11.74 10.07	0.059*

S60-N0:Signal at 60 dB SPL, no noise; S60- N60:Signal at 60 dB SPL; noise at 60 dB SPL SMCL-NBNL: Signal at MCL, noise at BNL



Table 3. Relationship between ANL, GIN Threshold and TPS with SRS obtained from three different listening conditions in the young and elderly groups.

			ANL	GIN Threshold	TPS
Young Group	S60-N0 SRS	R Sig.(2-tailed) N	-0.01 0.92 30	0.12 0.50 30	-0.04 0.80 30
	60-N60 SRS	R Sig.(2-tailed) N	-0.02 0.92 30	0.01 0.96 30	0.05 0.77 30
	SMCL-NBNL SRS	R Sig.(2-tailed) N	0.45* 0.01 30	0.09 0.63 30	-0.23 0.20 30
Elderly Group	S60-N0 SRS	R Sig.(2-tailed) N	-0.13 0.52 25	-0.18 0.38 25	0.35 0.08 25
	S60-N60 SRS	R Sig.(2-tailed) N	-0.32 0.10 25	-0.42* 0.04 25	0.42* 0.03 25
	SMCL-NBNL SRS	R Sig.(2-tailed) N	0.16 0.44 25	-0.36* 0.08 25	0.30* 0.13 25

S60-N0: Signal at 60 dB SPL, No noise; S60- N60: Signal at 60 dB SPL; Noise at 60 dB SPL SMCL-NBNL: Signal at MCL, Noise at BNL

Table 4. Effect of age on variables.

		S60-N0	S60-N60	SMCL - NBNL	ANL	GIN Threshold	TPS
AGE	r	-0.358*	-0.502*	-0.520*	0.300	0.636*	-0.670*
	Sig. (2-tailed)	0.003	0.000	0.000	0.012	0.000	0.000
	N	55	55	55	55	55	55

*Correlation is significant at the 0.01 level (1-tailed).

S60-N0: Signal at 60 dB SPL, No noise; S60- N60: Signal at 60 dB SPL; Noise at 60 dB SPL SMCL-NBNL: Signal at MCL, Noise at BNL

DISCUSSION

The temporal resolution which provides a measure of information about vowels, consonants, syllables and phrase boundaries, is an important function of the central auditory system (15). This auditory function, which takes place through multiple ascending and descending tracts between the cerebral cortex, thalamus, and brainstem nuclei, is accomplished by the accurate and rapid decomposition of auditory information which causes neural activity in the subcortical and cortical areas. When the ability of the auditory system to perceive and process this information deteriorates for any reason, the content

information and intelligibility of speech is also deteriorated. In the literature, there are numerous electrophysiological, as well as behavioral studies, stating that the gap detection threshold increases with age. This condition, which is not associated with peripheral injury, is related with the deterioration of temporal resolution with aging (16) and the speed of temporal processing of the elderly in both active and passive listening conditions is suggested to be lower than that of younger subjects, with this reduction being even more evident in complex tasks (17). In our present study, our results were consistent with the literature, and gap detection performance in our elderly group was observed to decrease by approximately two-fold compared to the younger group and continued to decrease with increasing age.

Since it is known that the results obtained may vary depending upon stimulus parameter and stimulus type, broadband stimuli seem to be preferred usually because they are known to cause less variability in gap detection measurements (18). However, in case of a situation when frequency specific information is needed, tonal or various band limited noise stimuli are often used. Since individuals with normal hearing were included in our study, it was considered that spectral information could be neglected. Therefore, the GIN test, including broadband noise stimuli, was used. In addition, assuming that there is no difference between the ears (18, 19); binaural application was performed for the GIN test in order to better reflect the difficulty of discrimination in daily conversation as in the speech tests. As a result of this test, binaural GIN threshold was found to be 2.86 msec in the younger normal-hearing adults and 6.26 msec in the elderly adults. The other studies in the literature using the GIN test, GIN threshold was observed to vary from 3.9 to 5.61 msec in young adults with normal-hearing (7,18,20,21), and from 5.21 to 9 msec in elderly adults with normal-hearing (7,18,20). According to this, the mean GIN thresholds obtained from the young group in our study seem to be lower than those reported previously in the literature while our mean values for the elderly group are quite similar to those in the literature. The fact that the GIN thresholds obtained in the younger group were smaller than those in the literature can be explained by the age ranges accepted for the "young" group are not identical for every study and by the advantages provided by binaural listening. The consistency of our results for the elderly group when compared to the literature was attributed to using a more common definition for elderly people, and age-related reduced binaural processing ability. In order to elucidate this issue, future research should examine the results of monaural and binaural GIN tests across different age groups.

The results obtained in our study, as well as in many previous studies reported in the literature using different gap recognition parameters, clearly show the adverse effect of age upon gap detection performance. These findings, which are the consequence of decline and deterioration in temporal resolution ability, are considered to arise from an age-related decline in neural fiber numbers and related subcortical neural unit and synchronization dysfunction in the neural fibers creating stimulus response patterns (22,23). These deteriorations, which make difficult to detect and understand the fast components of speech, are suggested to be the primary cause of discrimination problems in the elderly (10). However, the presence of many other factors, including peripheral, central, and cognitive processes, which have an impact upon speech perception, make difficult to assess the effect of temporal resolution on discrimination problem alone. Since the contribution of these factors, which have many complex and diverse connections with each other, on listening and communication functions, varies among individuals, the results in the literature are inconsistent with each other. Although the findings indicating that temporal decline begin in the early periods and that deteriorations in speech perception associated with these declines are dominant, auditory temporal processing measurements could not be proven to be a strong indicator to reflect speech recognition performance in elderly individuals (9). In our study, no strong correlation was identified between temporal



resolution and speech recognition performance. As a result of the speech recognition tests conducted at three different listening conditions, the scores of both groups obtained in noisy conditions were lower than those obtained in quiet conditions. These findings show that noise is the most important variable on recognition performance. Comparing group performances, the decline in the elderly group was found to be higher than that of the younger group. The more prominent effect of noise upon elderly people can be explained by age-related changes in the efferent system.

In order to investigate the effect of self-determination for the signal-to-noise ratio on speech recognition performance in noise, the assessment was carried out under conditions in which speech was presented as MCL and noise was presented as BNL; no significant difference was observed between the SNRs preferred by either of our test groups. Comparing the scores obtained in two different noise conditions, some improvement was observed to occur in speech recognition scores when individuals determined the signal-to-noise ratio themselves; this improvement was significant in the young group but not in the elderly group. These findings indicated that elderly people have more difficulty in speech perception in noisy conditions and require more SNR. Furthermore, ANL did not correlate with speech recognition performance in noise or with age. In the literature, similar to our study, ANL was not observed to be associated with age (24) or speech recognition performance in noisy conditions (25). The fact that the underlying mechanism for these observations has yet to be elucidated yet, suggests that the studies on the ANL test should continue.

Examining the reduction in gap detection performance of the elderly group in relation to the recognition scores at various signal-to-noise ratios, the gap detection performance was observed to show a weak positive correlation with the scores obtained in noise but not with the scores obtained in quiet conditions. These results, which are consistent with the literature, appear to suggest that the declines in temporal resolution with age have an impact upon speech perception more significantly in noise, but not in quiet. When the relationship between age and speech recognition scores was examined, a negative moderate correlation was found in noise conditions, whereas a weak negative correlation was found in the quite condition. These findings suggest that speech recognition performance is decreased with age, especially in noisy situations.

In conclusion, our study showed that temporal resolution decreased significantly with age, and that these declines correlated with speech recognition scores in noisy conditions but not in quiet conditions. This situation reveals that elderly people have more difficulty in understanding speech in noisy and reverberant environments. On the other hand, the GIN test that we used to assess temporal resolution was highly advantageous since it was quickly applicable, reliable, and relatively simple, compared to the other tests in which using different stimuli were used in the literature. The GIN test was considered to represent a suitable test for routine audiological test batteries to assess temporal resolution in patients admitted to clinics complaining of comprehension difficulty despite normal peripheral hearing.

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RESEARCH

A RETROSPECTIVE STUDY ON THE ETIOLOGICAL FACTORS OF CHRONIC PRURITUS IN THE ELDERLY

Abstract

Introduction: Pruritus, a common symptom in the elderly, is usually a chronic condition lasting for more than 6 weeks. Chronic pruritus in the elderly may be caused by systemic diseases, including renal diseases, iron deficiency anemia, parasitoses, hepatobiliary diseases, leukemia, lymphomas, and endocrine disorders. In this retrospective study, we aimed to investigate the relationship of systemic diseases with chronic pruritus in the elderly.

Materials and Method: Descriptive statistics were computed for means, standard deviations, and frequencies. The chi-square test or Fisher's exact test was used for statistical analysis, with a significance threshold of $p<0.05$.

Results: Totally, 631 consecutive patients [307 males and 324 females; mean age, 73.34±6.49 years (range, 65–95 years)] were enrolled. In 292 patients, at least one laboratory test was performed to identify the etiology of chronic pruritus. In 42 patients, abnormal laboratory test results led to the diagnosis of a pruritus-related systemic disease. This study revealed that 21 patients had iron deficiency anemia, 2 had solid malignancies, 7 had hypothyroidism, 8 had renal disease, and 5 had hepatobiliary diseases. There was a statistically significant relationship between performing laboratory tests for chronic pruritus and detecting a pruritus-related systemic disease ($p<0.001$).

Conclusion: Chronic pruritus in the elderly poses a diagnostic challenge. Our study showed that chronic pruritus may be a manifestation of an underlying systemic disease. Therefore, we suggest that multiple etiologies should be considered based on relevant clinical and investigational data.

Key Words: Pruritus; Aged; Laboratories

ARAŞTIRMA

YAŞLILARDA GÖRÜLEN KRONİK PRURİTUS ETİYOLOJİSİ ÜZERİNE RETROSPEKTİF BİR ÇALIŞMA

Öz

Giriş: Yaşlılarda sık karşılaşılan bir semptom olan kaşıntı, genellikle 6 haftadan uzun süren kronik bir durumdur. Yaşlılarda görülen kronik kaşıntı, böbrek hastalıkları, demir eksikliği anemisi, parazitozlar, hepatobiliyer hastalıklar, lösemi, lenfomalar ve endokrinolojik hastalıkları içeren çok sayıda sistemik hastalıkla ilişkili olabilir. Bu retrospektif çalışmada, yaşlılarda görülen kronik kaşıntı ile sistemik hastalıkların ilişkisini araştırmayı hedefledik.

Gereç ve Yöntem: Çalışmada ortalama, standart sapma ve frekans değerleri için betimsel analiz yapıldı. İstatistiksel karşılaştırmalarda ki-kare veya Fisher kesin ki-kare test kullanıldı. $p<0.05$ olan değerler istatistiksel olarak anlamlı kabul edildi.

Bulgular: Toplamda 631 ardışık hasta [307 erkek ve 324 kadın; ortalama yaş, 73.34±6.49 yıl (dağılım, 65–95 yıl)] değerlendirildi. 292 hastada kronik pruritus etiyolojisini saptamak amacıyla en az bir laboratuvar testi yapıldı. 42 hastada patolojik olarak sonuçlanan laboratuvar testleri pruritus ilişkili sistemik hastalığın tanısının konmasına yol açtı. Bu çalışma ile 21 hastada demir eksikliği anemisi, 2 hastada solid malignite, 7 hastada hipotiroidizm, 8 hastada böbrek hastalığı ve 5 hastada hepatobiliyer hastalık tespit edildi. Kronik pruritus için laboratuvar tetkiki yapmak ile pruritus ilişkili sistemik hastalık tespiti arasında istatiksel olarak anlamlı ilişki saptandı ($p<0.001$).

Sonuç: Yaşlılarda görülen kronik pruritus tanı koyma bakımından güç bir durumdur. Çalışmamız, kronik pruritusun altta yatan sistemik bir hastalığın bulgusu olabileceğini göstermiştir. Bu nedenle, uygun klinik ve laboratuvar veriler doğrultusunda çok sayıda etiyolojinin göz önünde bulundurulması gerektiği düşünülmektedir.

Anahtar Sözcükler: Pruritus; Yaşlı; Laboratuvar

INTRODUCTION

Pruritus or itching has been defined as "the unpleasant skin sensation that frequently provokes scratching'(1). It is a highly prevalent and clinically relevant symptom in dermatology (2). Chronic pruritus refers to daily/almost daily itching lasting for more than 6 weeks (3,4). Beyond dermatologic disorders, chronic pruritus is associated with systemic diseases,including renal diseases, iron deficiency anemia, parasitoses, hepatobiliary diseases, human immunodeficiency virusinfection, brain tumors, polycythemia vera, leukemia, lymphomas, and endocrine disorders (1,3-5). In the literature, there are multiple studies that have investigated the role of systemic factors in the etiology of chronic pruritus (6-11). However, to our knowledge, there are inadequate data on the role of systemic diseases in the etiopathogenesis of chronic pruritus in the elderly. In this retrospective study, we aimed to investigate the role of systemic factors in the etiopathogenesis of chronic pruritus in the elderly.

MATERIALS AND METHOD

We retrospectively reviewed the medical records of patients aged ≥65 years who were treated at our institution between April 2015 and April 2016 with a diagnosis of chronic pruritus. We recorded data from the hospital patient charts after ensuring consistency with the study protocol. The study was conducted in accordance with the Declaration of Helsinki and was approved by the medical ethical committee of Ankara Numune Research and Education Hospital, Turkey (Protocol no: 2016-1179). All of the patients met the inclusion and exclusion criteria of the study. Inclusion criteria were the clinical diagnosis of chronic pruritus with a duration of more than 6 weeks and no history of primary skin lesions. We only included patients whom diagnosis of chronic pruritus was made in the dermatology department. We excluded patients with a prior history of a pruritus-related systemic disease. Patients with dermatoses with acute pruritus were not considered within the study. Data obtained from the records included age, sex, accompanying diseases, and if present, laboratory workups for chronic pruritus and the outcomes of these laboratory tests. Laboratory workups that had been selected in order to exclude underlying etiologic factors in chronic pruritus were without a standart protocole, each test reflect the preference of the individual doctor working at the department.

A detailed statistical analysis was made based on the acquired retrospective data. Statistical analysis was performed using SPSS software, Version 18 (SPSS Inc., Chicago IL, USA). Frequencies were calculated for variables related to demographic and clinical patient characteristics. Age was described as mean±standard deviation and range. The chi-square test or Fisher's exact test was conducted to determine statistical associations between performing laboratory tests for pruritus and detecting a pruritus-related disease. A p-value of <0.05 was considered statistically significant.

RESULTS

Totally, 631 consecutive patients [307 males (48.7%) and 324 females (51.3%); mean age, 73.34±6.49 years (range, 65–95 years)] were enrolled. There was a history of at least one medical problem in 64.5% of the patients (n=407). Table 1 shows the frequencies of accompanying diseases in the study group. In 46.3% of the patients (n=292), at least one laboratory test was performed to identify the etiology of chronic pruritus. Table 2 shows the frequency of laboratory tests performed, and Table 3 demonstrates the frequency of abnormal results obtained from laboratory tests. In 6.7% of the patients (n=42), abnormal results obtained from laboratory tests led to the diagnosis of a pruritus-related systemic disease. In total, 3.3% of the patients (n=21) had iron deficiency anemia, 0.3% (n=2) had solid malignancies, 1.1% (n=7) had hypothyroidism, 1.3% (n=8) had renal disease, and 0.8% (n=5) had hepatobiliary diseases.

A statistically significant relationship was found between performing laboratory tests for chronic pruritus and detecting a pruritus-related disease ($p<0.001$). Among patients who had undergone laboratory tests, 13.4% were diagnosed with a pruritus-related disease. In addition, 92.9% ofthe patients eventually diagnosed with a pruritus-related disease had undergone laboratory tests. Statistically significant relationships were observed between performing laboratory tests and detectingiron deficiency anemia, hypothyroidism, and hepatic and biliary disorders ($p<0.001$, $p=0.004$, and $p=0.021$, respectively). There were no statistically significant relationships between performing laboratory tests and detecting a solid malignancy ($p=0.214$) or renal disease ($p=0.153$).

DISCUSSION

Pruritus is one of the most common dermatological complaints. However, it can be the marker of a systemic disorder (1,3,4). In the literature, there are reports that have described a causal link between pruritus and systemic diseases (5,9-11). In the present retrospective study, we aimed to investigate this causal relationship in an elderly population. We retrospectively reviewed medical records in our hospital and found that 46.3% of the patients underwent at least one laboratory test to identify the etiology of chronic pruritus. In 6.7% of the patients, abnormal results from laboratory tests led to the diagnosis of a pruritus-related systemic disease, including iron deficiency anemia, solid malignancy, hypothyroidism, renal disease, and hepatobiliary diseases.

Iron deficiency anemia was the most common pruritus-related systemic disease in our study. A number of other hematologic diseases, including polycythemia vera, hemochromatosis, leukemia, Hodgkin's lymphoma, and myeloma, have been reported to be are associated with pruritus. In contrast to other hematologic diseases, little is known about the biochemical mechanisms involved in the pathophysiology of anemia-related pruritus (1,5,12,13). However, even in the absence of anemia, pruritus is a prevalent symptom and iron replacement therapy typically resolves anemia-related pruritus within weeks (1,12,14). It has been suggested that there is a link between malignancy, malignancy-related anemia, and anemia-related pruritus (1). Tumors cause pruritus not only because of anemia but also because of the release of endogenous compounds, including opioids and cytokines. Paraneoplastic pruritus has been defined as chronic pruritus that is a sign of malignancy. Pruritus of lymphoma is a well-known prototype of paraneoplastic pruritus, but solid tumors may also cause intractable pruritus (15). In the present study, we demonstrated that chronic pruritus is associated with a solid malignancy in 0.3% of patients.

It is well established that hypothyroidism is associated with chronic pruritus. It is postulated that dry skin (xerosis) in hypothyroidism is the result of decreased sebaceous gland activity, decreased sweat secretion, and low epidermal sterol synthesis (1,5,13). In elderly patients, dry skin is one of the most common dermatological conditions. With advancing age, skin water content and sebum production decrease but the number and size of corneocytes increase, which are the primary cell type in the stratum corneum, the outermost part of the epidermis (16). Apparently, both hypothyroidism and evident changes associated with advancing age contribute to hypothyroidism-associated pruritus in the elderly. In 1.1% of the patients in the present study, hypothyroidism led to pruritus.

Renal diseases and hepatobiliary diseases are other pruritus-related diseases detected in the present study. Uremia is one of the most important systemic causes of generalized pruritus. It has been suggested that uremic pruritus affects 50–90% of patients undergoing dialysis (17). The exact pathogenic basis of pruritus in renal failure is unknown. However, it is wellknown that uremic pruritus only occurs in chronic renal failure and that renal failure must be severe to be associated with pruritus. Uremic xerosis, secondary hyperparathyroidism, hypervitaminosis A, uremic neuropathy, elevated serum histamine levels, and uremic toxins have been described as factors triggering uremic pruritus (17-19).

Table 1. Frequencies of accompanying diseases in the study group.

Diseases	***n***	**%**
Cardiovascular diseases	205	32.5
Neuropsychiatric disorders	63	10.0
Solid malignancy	4	0.6
History of solid malignancy	11	1.7
Gastrointestinal diseases	29	4.6
Diabetes mellitus	83	13.2
Renal insufficiency	14	2.2
Hypo/hyperthyroidism	31	4.9
Pulmonary diseases	21	3.3
Leukaemia/ lymphoma/ myeloma	3	0.5
Anemia	5	0.8
Nutritional deficiencies	2	0.3
Coagulopathies	2	0.3
Other (cataracts, glaucoma, hemorrhoid, osteoporosis, gonartrosis, allergic rhinitis/ conjunctivitis, psoriasis, nefrolitiasis, benign prostatic hyperplasia, rheumatoid arthritis)	93	14.7

Pruritus is a common symptom of cholestatic, hepatobiliary diseases. Both intra- and extrahepatic cholestatic diseases may cause pruritus, including primary biliary cirrhosis, primary sclerosing cholangitis, chronic hepatitis B and C, carcinoma of the bile ducts, alcoholic cirrhosis, and autoimmune hepatitis. Although the exact underlying pathogenic mechanisms remain unknown, lysophosphatidic acid, bile salts, opioids, histamine, and progesterone metabolites may be involved in the development of cholestatic pruritus (1,5,9,20). Clearly, there are numerous mechanisms involved in the pathogenesis of pruritus-related diseases. In this study, we investigated the role of systemic factors in the etiopathogenesis of chronic pruritus in the elderly. We retrospectively reviewed medical records to determine the percentage of patients who had undergone laboratory tests and the outcomes of these laboratory tests.

In this study, we found a statistically significant relationship between performing laboratory tests for chronic pruritus and detecting a pruritus-related disease. Overall, abnormal laboratory test results led to the diagnosis of a pruritus-related systemic disease in 6.7% of the patients. There are numerous underlying factors for chronic pruritus that necessiate detailed laboratory



analysis. As seen in Table 2, we performed several laboratory tests. Although some advanced tests, such as protein electrophoresis and determining antinuclear antibody and total immunoglobulin E concentrations, were performed in a small number of patients, the total number of tests performed is not negligible. Of note, we did not perform associated laboratory tests in patients with a history of pruritus-related disease. Therefore, our results reflect newly diagnosed hypothyroidism, anemia, malignancy, hepatobiliary diseases, or renal insufficiency.

On the other hand, there are limitations of our study. One of the most important limitation is that laboratory analysis that had been selected for patients were without a standard protocole, each test reflect the preference of the individual doctor working at the department. But, the study was not designed prospectively, therefore as a retrospective study, we are only left to conclude from the available data. Although the main goal of this study was to investigate the role of systemic factors in the etiopathogenesis of chronic pruritus, we also planned to reveal the preferences of clinicians dealing with chronic pruritus and whether or not it is worth performing detailed laboratory investigations also what are the proportions of each performed laboratory tests. Furthermore, there is an another major limitation for this study. Some of the advanced tests, such as protein electrophoresis and determining antinuclear antibody and total immunoglobulin E concentrations, were performed only in a small number of patients, which might cause suspicion about the appropriateness of the interpretation of the statistical analysis.

We suggest that our study contributes to the existing literature. We have shown that although it seems to be demanding, a comprehensive investigation should be carried out in every patient with chronic pruritus. Indeed, history and physical examination are the main components of the evaluation of a patient. In this study, we included patients whom diagnosis was made through a stepwise approach. We excluded patients with a preexisting pruritus-related disease and dermatoses with pruritus. Also we took a detailed drug history. It is wellknown that elderly patients frequently use drugs that might be the real cause of chronic pruritus. Therefore, our results reflect newly diagnosed diseases, indicating the importance of investigation for chronic pruritus.

Chronic pruritus is a common problem in the elderly. In everyday practice, dermatologists encounter senile people with chronic pruritus. There should be an algorithm to determine which patients should undergo detailed laboratory tests. In the literature, there are an inadequate number of studies on the relationship of systemic diseases with chronic pruritus in the elderly (21). We believe that our study will enrich the limited data available on the relationship between systemic diseases and chronic pruritus in the elderly. It is important to note that the laboratory tests in our patients were detailed. The financial impact of these investigations should be considered. In conclusion, we recommend a comprehensive evaluation for all elderly patients with chronic pruritus. History, physical examination and laboratory investigations should be the mainstay of this evaluation. Further studies are needed to elucidate the relationship between systemic diseases and chronic pruritus in the elderly and to determine the best algorithm for assessing which laboratory tests are necessary.

Conflicts of Interest

The authors declare no conflict of interest.

Table 2. Laboratory investigations and results.

Laboratory tests			Pathological laboratory results		
	n	%		n	%
Complete blood count	281	44.5	Anemia	72	11.4
			Polycythemia	1	0.2
			Thrombocytopenia	12	1.9
			Thrombocytosis	2	0.3
			Leukocytosis	15	2.4
			Eosinophilia	41	6.5
			Leukopenia	20	3.2
Sedimentation	178	28.2		54	8.6
C-reactive protein	156	24.7		44	7.0
Rheumatoid factor	21	3.3		8	1.3
Blood urea nitrogen	284	45.0		59	9.4
Alanine aminotransferase	282	44.7		10	1.6
Aspartate aminotransferase	279	44.2		7	1.1
Gamma-glutamyl transferase	248	39.3		21	3.3
Total protein	95	15.1		3	0.5
Sodium	132	20.9		8	1.3
Potassium	125	19.8		8	1.3
Parathyroid hormone	129	20.4		17	2.7
Folate	33	5.2		2	1.3
25-hydroxyvitamin D	69	10.9		34	5.4
Prostate specific antigen	113	17.9		19	3.0
Hepatitis B and C serology	90	14.3		36	5.7
Fecal occult blood test	91	14.4		8	
Total immunoglobulin E	11	1.7		4	0.6
Antinuclear antibodies	21	3.3		2	0.3
Peripheral blood smear	174	27.6		34	5.4
Anti-streptolysin O	19	3.0		3	0.5
Fasting blood glucose	264	41.8		62	9.8
Creatinine	288	45.6		36	5.7
Uric acid	49	7.8		12	1.9
Alkaline phosphatase	232	36.8		18	2.9
Albumin	107	17.0		7	1.1
Calcium	150	23.8		6	1.0
Ferritin	144	22.8		20	3.2
Thyroid function test	154	24.4		34	5.4
Thyroid autoantibodies	96	15.2		15	2.4
Vitamin B_{12}	76	12.0		3	0.5
Human immunodeficiency virus screening	50	7.9		6	1.0
Stool parasite testing	65	10.3		1	0.2
Protein electrophoresis	8	1.3		-	-
Total iron binding capacity	169	26.8		20	3.2

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RESEARCH

WHAT ARE THE DIFFERENCES BETWEEN ELDERLY AND NON-ELDERLY ASTHMA PATIENTS?

Abstract

Introduction: Previous studies have shown that diagnostic delay increases the severity of asthma in elderly populations. Addressing the disease characteristics in elderly patients may prevent delayed diagnosis and allow for better asthma control.

Materials and Method: Data of 160 asthma patients who had regular checkups in the last year were collected from a tertiary university hospital. Patients were divided into two groups: non-elderly (aged <60 years) and elderly (aged ≥60 years). Demographic characteristics, comorbidities, and clinical and functional parameters were documented.

Results: Most patients were non-elderly (68.1%) and never smokers (83.1%). Mean age at diagnosis and mean duration of asthma were higher in the elderly group; most elderly patients had late-onset asthma (p<0.05). Ratio of patients with a smoking history was lower, comorbidity rates were higher, and more patients were overweight in the elderly group (p<0.05). Fewer elderly patients had aeroallergen sensitization, polysensitization, or allergic rhinitis (p <0.05). Mean number of hospitalizations was higher, ad ratio of patients with good asthma symptom control was lower in the elderly group (p <0.05). In the elderly group, the ratio of the mean forced expiratory volume in the first second to the forced vital capacity and forced expiratory flow at 25%–75% of forced vital capacity were lower (p <0.05).

Conclusion: In elderly patients, asthma control was poorer and the rates of late-onset asthmatics (90.2%) and never-smoker asthmatics (92.2%) were higher. Despite the lower atopy rate (45.1%), the sensitization pattern was similar to that in younger patients.

Key Words: Asthma; Aged; Age at onset

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ARAŞTIRMA

YAŞLI VE YAŞLI OLMAYAN ASTIMLI HASTALAR ARASINDAKİ FARKLILIKLAR NELERDİR?

Öz

Giriş: Yapılan çalışmalar, yaşlı nüfusta astım tanısındaki gecikmenin hastalığın ciddiyetini artırdığını göstermiştir. Yaşlılarda bu hastalığın özelliklerinin gösterilmesi tanı gecikmesini önleyerek daha iyi astım kontrolü sağlayacaktır.

Gereç ve Yöntem: Son bir yıldır üçüncü basamak üniversite hastanesine düzenli kontrol başvuruları olan 160 astım hastasının verileri toplandı. Hastalar yaşlı olmayan (<60 yaş) ve yaşlı (≥60 yaş) olmak üzere iki grupta incelendi. Demografik özellikleri, ek hastalıkları, klinik ve fonksiyonel parametreleri kaydedildi.

Bulgular: Hastaların çoğunluğunu yaşlı olmayanlar (%68.1) ve hiç sigara içmemişler oluşturuyordu (%83.1). Ortalama tanı yaşı, ortalama astım süresi yaşlı grupta daha yüksekti ve yaşlı hastalarda geç-başlangıçlı astım çoğunluktaydı (p<0.05). Yaşlı grupta sigara içme öyküsü daha azdı, ek hastalık yüzdesi daha yüksekti ve aşırı kilolu hastalar çoğunluktaydı (p<0.05). Yaşlı grupta solunumsal allerjen duyarlılığı, çoklu allerjen duyarlılığı ve allerjik riniti olanların sıklığı daha düşüktü (p<0.05). Ortalama hastane yatış sayısı yaşlı grupta daha fazlaydı ve astım kontrol testine göre kontrol altında olanların oranı yaşlı grupta daha azdı (p<0.05). Yaşlılarda birinci saniye zorlu ekspirasyon volümünün zorlu vital kapasiteye oranının ve zorlu ekspirasyon ile volümlerin % 25 ila %75'inin atıldığı perioddaki akım hızının ortalamaları daha düşüktü (p<0.05).

Sonuç: Yaşlılarda astım kontrolü daha zayıftı ve geç-başlangıçlı astım hastalarının (%90.2) ve hiç sigara içmemişlerin (%92.2) yüzde değerleri daha yüksek bulundu. Daha düşük atopi yüzdesine rağmen (%45.1), duyarlılık dağılımı yaşlı olmayanlara benzer saptandı.

Anahtar Sözcükler: Astım; Yaşlı; Başlangıç yaşı

INTRODUCTION

Asthma is a common chronic respiratory disease affecting 1%–18% of the population of various countries (1). In Turkey, its prevalence has been determined to be between 2% and 10% in adults (2). Asthma was mainly considered a childhood disease in the past, but this belief has changed after the publication of studies proving that late-onset or even long-standing asthma is highly frequent among the elderly population. Worldwide studies have shown that in elderly populations, the prevalence of asthma ranges from 4.5% to 12.7% (3). There are very limited data specifically stating the asthma prevalence among Turkey's elderly population (4).

Although studies in developed countries have used ≥65 years as the age requirement for "elderly" individuals, current data from the World Health Organization (WHO) and United Nations have classified those aged ≥60 years as elderly, particularly in developing countries (5). Turkey consists of approximately 8.5 million people aged ≥60 years; this number accounts for approximately 11% of the country's population and is expected to increase to 14% by 2025 (6). Therefore, additional studies should be conducted for detecting problems among the elderly population and for finding solutions.

Studies have found that the rates of misdiagnosis or underdiagnosis of asthma are high in elderly populations. In addition, the rates of non-atopic asthma, severe asthma-related symptoms, and comorbid diseases are higher in elderly patients than in younger patients (7,8). Because asthma in the elderly is highly under- or misdiagnosed and thus undertreated, we evaluated and compared the demographic and clinical characteristics of our elderly asthmatic patients with those of non-elderly patients in this study. A recent review suggested the term "geriatric asthma" instead of "asthma in the elderly," because the latter phrase only describes the occurrence of the disease in this age range (7). Accordingly, our study compared geriatric asthmatics with younger asthmatics; however, we preferred to use both terms at appropriate places in our article. The contribution of these data to the literature would lead to a better understanding of the geriatric asthmatic population's characteristics, which is important for avoiding the significant diagnostic delay in this group.

MATERIALS AND METHOD

Study population

This study was conducted at a tertiary university hospital located in the eastern Black Sea region of Turkey, which has the most dense elderly population in our country. We retrospectively evaluated the data from asthma follow-up medical records of patients who were diagnosed with asthma according to the Global Initiative for Asthma (GINA) guidelines (1) and who had been admitted to the outpatient asthma clinic of the adult immunology and allergic diseases department at the hospital between June 2013 and January 2016. All the asthma patients included in our study had been regularly followed for at least the previous year.

Clinical variables

From the medical records, the asthma patients' sociodemographic (gender, age, employment status, body mass index (BMI), comorbid diseases, and smoking history), asthma history (age at asthma diagnosis), asthma-related conditions (aeroallergen sensitivity/atopy, sinonasal polyposis, allergic rhinitis, and drug allergies), clinical progression of asthma (asthma symptom control, number of controller medications, and hospital/emergency department admissions) and pulmonary function test (PFT) result data were obtained.

Aeroallergen sensitivity was determined according to the skin prick test, which was performed for a common panel of inhalant allergens, including *Dermatophagoides pteronyssinus* and *Dermatophagoides farinea*

(house dust mites), *Aspergillus, Alternaria, Cladosporium* and *Penicillium* (molds), cat and dog animal dander, latex, pollens from grass, trees and weeds, and cockroaches (Allergopharma Reinbek, Germany). Positive and negative controls were histamine (10 mg/mL) and phenolated glycerol-saline, respectively. All tests were performed on the volar surface of the patients' forearms using prick lancets. Reactions were measured after 15 min. A test was considered positive if it produced a wheal with a mean diameter (mean of maximum and 90° midpoint diameters) of >3 mm greater than the saline control. Atopy was defined as the presence of clinically relevant history and a positive skin test response to at least one inhalant allergen.

For evaluating asthma symptom control, GINA assessment of asthma control in adults was used (1). The four related questions are as follows. In the past 4 weeks, has the patient (1) experienced daytime asthma symptoms more than twice/week? (yes/no), (2) experienced any night waking due to asthma? (yes/no), (3) needed a symptom reliever more than twice/week? (yes/no), and (4) experienced any activity limitation due to asthma? (yes/no). Questions were asked to patients via face-to-face interviews. Based on the answers to these questions, the level of asthma symptom control was classified as well-controlled (absence of any "yes" answer), partly controlled (1–2 "yes" answers), or uncontrolled (3–4 "yes" answers).

PFTs were performed at rest in a sitting position using a pulmonary spirometer (CareFusion, Germany, 234 GmbH). The best of three attempts was recorded. Bronchodilator response was assessed by comparing the pre- and post-bronchodilator forced expiratory volume in the first second (FEV1). An FEV1 increase of >200 mL and 12% of the baseline value was accepted as a positive bronchodilator response. Reversibility of airflow limitation was measured after the administration of 400 µg of salbutamol.

Information on potential confounders

Smoking status was recorded as never smoker, former smoker, or current smoker. Those who had smoked >100 cigarettes in their lifetime and had smoked in the last 28 days were classified as current smokers; those who had smoked >100 cigarettes in their lifetime but had not smoked in the last 28 days were classified as former smokers; and those who had smoked <100 cigarettes in their lifetime and were not currently smoking were classified as never smokers. The number of pack-years (packs smoked per day × years as a smoker) was also recorded. A history of comorbidities (present/absent) was defined as a positive answer to questions regarding physician-diagnosed diabetes, hypertension, cerebrovascular disease, pulmonary disease, ischemic heart disease, and other diseases. The employment status of each patient at the time of data analysis was categorized as housewife, student, and others, according to most commonly observed jobs in the study population. Height and weight was measured while wearing light clothes and no shoes. BMI was calculated as the weight divided by the square of the height and was categorized according to the following criteria recommended by the WHO: underweight (<18.5 kg/m^2), normal range (≥18.5–25 kg/m^2), overweight (≥25–30 kg/m^2), and obese (≥30 kg/m^2). Polysensitization was defined as sensitization to at least two structurally different aeroallergens according to skin prick test. The presence (or absence) of sinonasal polyposis, allergic rhinitis, and drug allergies was evaluated based on a reliable history and endoscopic examination performed at the ear–nose–throat department. Lifetime hospitalization and emergency department visits related to asthma exacerbation were reported as number of visits.

Statistical analysis

Patients were evaluated in two groups: <60 years (non-elderly asthmatics) and ≥60 years (elderly asthmatics). For data analysis, Statistical package for the social sciences (SPSS) version 20 was used. Categorical variables are expressed as absolute and relative frequencies, whereas quantitative



variables are expressed as mean and standard deviation. To evaluate the relationship between independent variables (demographic variables, asthma history, asthma clinical course, PFT) and dependent variables (non-elderly asthmatics, elderly asthmatics) Pearson's *chi* square test was used for categorical variables and for numerical variables independent samples *t* test was used. The associations were considered significant at $p<0.05$.

Ethics

Ethical approval for the study was obtained from the institutional ethical committee.

RESULTS

In total, 160 asthma patients' data were analyzed in the study. The mean age of the patients was 49.7 ± 16.4 (16–82) years, with female predominance (126 patients, 78.8%). Age distribution and detailed demographic data of the patients are shown in Figure 1 and Table 1, respectively. Most patients were younger than 60 years (109, 68.1%), and only 31.9% of patients were aged ≥ 60 years. In the univariate analysis of demographic characteristics, the proportions of female patients, housewives, obese patients, never smokers, and patients with at least one comorbidity were higher in the elderly group ($p<0.05$), whereas the proportion of male patients was only higher in the non-elderly group ($p<0.05$; Table 1). In the elderly group, the mean FEV1 to forced vital capacity (FEV1/FVC) ratio and forced expiratory flow at 25%–75% of FVC (FEF25%-75%) were lower ($p<0.05$); however, there was no statistically significant difference in the mean FEV1% predicted (Table 1).

Table 1. Demographic characteristics of the study group.

	The whole group n=160	Non-elderly asthmatics n=109 (68.1%)	Elderly asthmatics n=51 (31.9%)	p
Male gender, n (%)	34 (21.2)	28 (25.7)	6 (11.8)	**0.04**
Age, year, mean±sd	49.7±16.4 (16-82)	40.8±11.2 (16-59)	68.7±6.9 (60-82)	**<0.0001**
Employment status (Housewife), n (%)	107 (66.9)	63 (57.8)	44 (86.93)	**0.001**
Overweight (BMI ≥30 kg/m²), n (%)	78(48.7)	45 (41.2)	33 (64.7)	**0.001**
Prevalence of comorbidity, n (%)	91 (56.9)	46 (42.2)	45 (88.2)	**<0.0001**
Never smokers, n (%)	133 (83.1)	86 (78.9)	47 (92.2)	**0.03**
Smoking pack.year, mean±sd	2.78±7.84	3.12±7.22	2.05±9.06	**>0.05**
FEV_1 % predicted, mean±sd	94.3±23.6	95.9±20.0	90.8±30.1	**>0.05**
FEF_{25-75} % predicted, mean±sd	69.0±29.9	73.0±29.0	60.4±30.2	**0.01**
FEV_1/FVC, mean±sd	76.3±9.0	77.6±8.74	73.3±9.25	**0.006**

Table 2. Asthma history and asthma related conditions of the patients.

	The whole group n=160	Non-elderly asthmatics n=109 (68.1%)	Elderly asthmatics n=51 (31.9%)	p
Age at asthma diagnosis,y, mean±sd (min 5, max 75)	41.3±15.1	35.2±11.9	54.3±12.8	**<0.0001**
Late onset (≥40 years), n (%)	86 (53.8)	40 (36.7)	46 (90.2)	**<0.0001**
Disease duration, y, mean±sd	8.5±9.16	5.74±4.95	14.3±12.7	**<0.0001**
Aeroallergen sensitization (positive skin prick test), n (%)	105 (65.6)	82 (75.2)	23 (45.1)	**<0.0001**
Polysensitization, n (%)	76 (72.4)	65 (79.3)	11 (47.8)	**0.003**
Sinonasal polyposis, n (%)	26 (16.3)	13 (11.9)	13 (25.5)	**0.03**
Allergic rhinitis, n (%)	128 (80.0)	99 (90.8)	29 (56.9)	**<0.0001**
Drug allergy, n (%)	10 (6.3)	7 (6.4)	3 (5.9)	**0.8**

Table 3. Clinical outcomes of the study group.

	The whole group n=160	Non-elderly asthmatics n=109 (68.1%)	Elderly asthmatics n=51 (31.9%)	p
Well asthma symptom control, n(%)	96 (60.0)	89 (81.6)	7 (13.7)	**<0.0001**
Lifetime hospitalisation, mean ±sd	0.76±3.02	0,27±1,02	1.82±5.01	**0.002**
≠ Lifetime ≥1 hospitalisation, n (%)	29 (18.1)	11 (10.0)	18 (35.2)	**<0.0001**
Lifetime emergency visits, mean ±sd	2.57±7.12	2.17 ±5.2	3.43±1.0	0.3
≠ Lifetime ≥1 emergency visits, n(%)	58 (36.2)	36 (33.0)	22 (43.1)	0.2
≠ Controller medication, mean ±sd	2.17±0.73	2.17±0.71	2.17±0.76	0.9
≠ Systemic corticosteroid use in lifetime, mean ±sd	2.22±6.27	1.94±5.02	2.82±8.38	0.4
≠ Patients on omalizumab	12 (7.5)	10 (9.1)	2 (3.9)	0.3

The asthma history and asthma-related conditions of the participants are listed in Table 2. In the univariate analysis, the mean age at asthma diagnosis, mean disease duration, rate of late-onset asthma (at ≥40 years of age) and rate of patients with SNP were higher in the elderly group, whereas the number of atopic, polysensitized patients and patients with allergic rhinitis was higher in the non-elderly group (Table 2). Additionally, the most commonly sensitized allergens were house dust mites, molds, and pollens in both groups (Figure 2).

Table 3 shows the clinical outcomes of the disease in all patients. In the univariate analysis, a lower rate of well-controlled asthma, higher mean lifetime hospitalizations, and ever hospitalization in lifetime were determined in the elderly group ($p<0.05$).

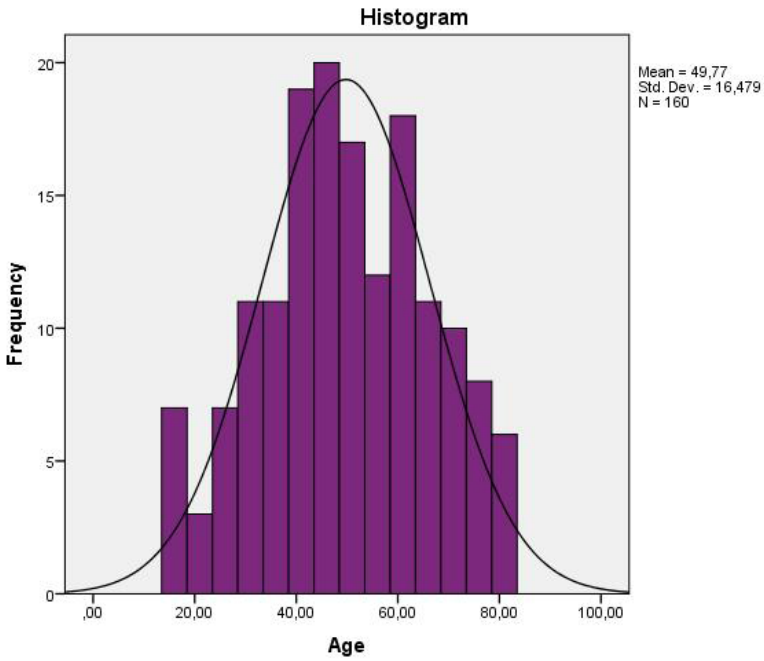


Figure 1. Age distribution of the patients.

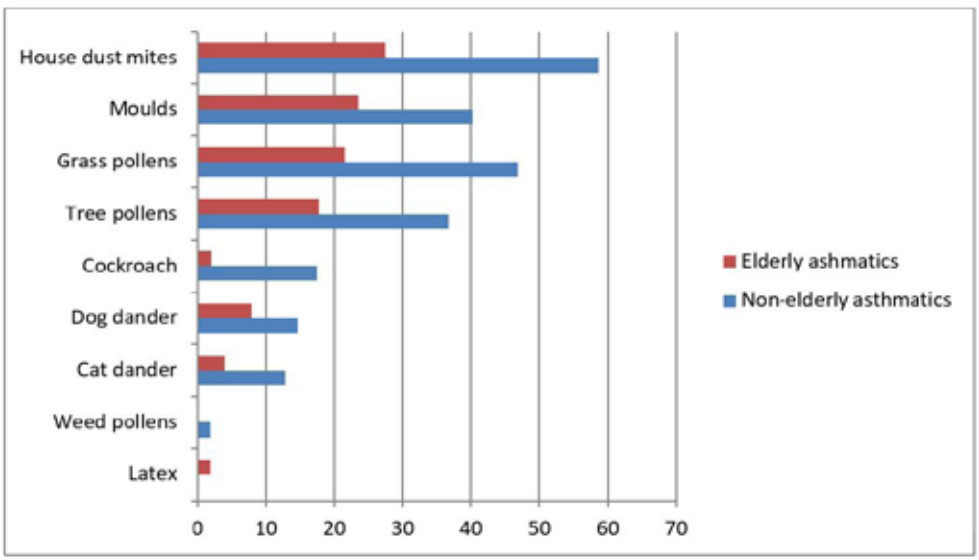


Figure 2. Distribution of aeroallergen sensitivity in percentages according to the age groups.

DISCUSSION

Previous studies have reported that an asthma diagnosis does not directly affect mortality (8); therefore, the life expectancy of individuals with and without asthma does not differ (3,9). Asthma treatment and monitoring require follow up for decades. However, due to certain barriers, such as comorbid diseases and uncertainty regarding the best testing methods, in the elderly population, it is difficult to even diagnose and properly treat the disease. Other barriers that have been reported in studies are both patient-related and clinician-related. The reduced perception or under-reporting of symptoms, difficulties in performing PFTs, insufficient understanding of the disease, poor adherence to therapy and follow up, poor inhaler technique, polypharmacy and increased risk of drug interactions, poor nutrition, sedentary life, and weight gain are patient-related factors; failure to recognize asthma due to comorbid conditions, misclassification as chronic obstructive pulmonary disease (COPD), and lack of knowledge regarding disease progression due to the exclusion of elderly age groups from population-based studies are classified as clinician-related factors (3,10). Accordingly, in this study, we evaluated and compared the characteristics of elderly asthma patients with those of a younger age group to better address the differences.

Our results showed that in our study population, older asthma patients accounted for 31.9%. Furthermore, older asthmatics differed in both demographic and clinical characteristics from younger asthmatics. Regarding demographic characteristics, the proportions of female patients, obese patients, never smokers, and patients with at least one comorbidity were higher among older asthmatics. Regarding clinical characteristics, the rate of late-onset asthma, mean age at asthma diagnosis, and number of patients with SNP were higher and the proportions of atopic patients and patients with allergic rhinitis were lower in the older group, despite almost half of them being sensitive to at least one aeroallergen. Asthma symptom control was poorer and the mean number of hospitalizations in lifetime and rate of hospitalization at least once in lifetime were higher in older asthmatics. Among PFT parameters, the mean rate of FEV1/FVC and FEF 25%-75% predicted were lower in the older group.

These findings exhibited both similarities to and differences from previous related studies. For example, Park et al. reported that older asthmatics' accounted for 26% of all asthma patients in their study; similarly, in our study that rate was 31.9%. However, in the same study, the female and male ratio was equal in the elderly population (11), but in our study, the rate of male patients in the elderly group was significantly lower. This result could be due to both higher underdiagnosis rates and less number of follow-up visits among male asthmatics than among female asthmatics at our institution. Asthma patients similar to those in our study are usually referred from other clinics or hospitals after being diagnosed by a pulmonologist or internal medicine specialist. It is possible that elderly male asthmatics were misdiagnosed as having COPD, coronary artery disease, heart failure, or other age-related conditions. In previous studies, it has been pointed out that patients and physicians commonly attribute asthma-like symptoms to other conditions (3), and a misdiagnosis of COPD is most commonly noted (12). Because even healthy elderly individuals have decreased FEV1/FVC due to the physiological changes of aging (such as increased stiffness of the chest wall, reduced respiratory muscle function, and decline of airway elasticity), they also exhibit decreased FEV1/FVC, leading to a misdiagnosis of COPD (13). As a result of these physiological changes, FEV1/FVC and FEF25%–75% were significantly lower in our older group, but FEV1 did not significantly differ between the older and younger groups, unlike that in previous studies (11,14). This difference may be explained by our department's position. It is a tertiary care unit and most patients are referred by clinicians



from other clinics due to a difficulty in controlling asthma-related symptoms, even among younger patients. Another reason for this result could be the age distribution of our study population; most patients were aged between 40 and 55 years (Fig. 1). Previous studies that have reported differences between younger and older patients' PFT results have compared individuals younger than 40 years with those older than 65 years (15,16), whereas we grouped all of our asthmatic patients aged<60 years into the "non-elderly" category.

The higher rates of comorbidities and obesity were similar to previous studies' findings (14,17). In the elderly, due to the high prevalence of comorbidities, depression, a sedentary lifestyle, and a decreased metabolism rate cause weight gain and obesity. Obesity has been suggested as a risk factor for asthma, especially among older women (18). In our study, the rate of obese patients was significantly higher in the elderly group. Moreover, 86.9% of them were housewives and 88.2% of them had comorbid diseases. These findings may suggest that the sedentary life of the elderly group could be a reason for high obesity rates.

In our study, the number of late-onset asthmatics whose age at diagnosis was ≥40 years, was significantly higher in the elderly group (90.2% vs. 36.7%). Disease duration was also significantly longer in older asthmatics (14.3 years vs. 5.7 years). In geriatric patients, asthma may persist from childhood or start in adult life, which is known as late-onset asthma. Late-onset asthma is less atopic in nature and progresses with more severe symptoms (19). However, in our study it was difficult to exactly define whether the late-onset patients had truly late-onset asthma or simply asthma that was recognized late. The importance of this difference has been stated in a previous report: "the 'missed' asthmatic patient with long-standing undertreated asthma is more likely to develop irreversible airflow obstruction" (20). From this point of view, based on the higher FEV1% values, we can speculate that the elderly asthmatics were mostly late-onset cases.

Atopy is an important contributor to asthma in older adults. Nonetheless, as expected, the proportions of atopic patients and polysensitized patients in the elderly group were lower than those in the younger group, despite almost half of the patients in the elderly group having aeroallergen sensitivity. The most common allergens were house dust mites, molds, and pollens in both groups. It is generally accepted that antigen-specific IgE sensitization decreases with age (3), and for many years asthma in older patients was characterized as non-atopic or intrinsic (9). However, over the past two decades, it has been reported that atopy is not uncommon among elderly asthmatics (3). Rogers et al. found the atopy rate in an asthma clinic to be 60% in patients aged > 65 years, and cockroach sensitization was the most prevalent at 47% (21). Huss et al. found that 74.6% of participants aged > 65 years tested positive for at least one allergen in a battery of common airborne allergens (22). In our elderly group, the atopy rate was 45.1%; therefore, skin tests in the elderly could be a good tool for managing asthma.

The number of patients with well-controlled asthma symptoms was significantly lower among the elderly group: 13.7% versus 81.6%. Furthermore, the mean number of hospitalizations and presence of previous hospitalizations was higher in the elderly group ($p<0.05$). In previous studies, older asthmatics exhibited a difficulty with asthma control (23), resulting in more hospitalizations and near-fatal asthma events (24). Bavbek et al. have also found advanced age to be a factor associated with severe asthma in Turkish patients (25). Some of the factors associated with the worse symptom control and severe asthma in the elderly are comorbid conditions, increased drug interactions, poor adherence to treatment recommendations, higher rates of obesity, less atopic nature of the disease, higher rates of late-onset asthma, and longer disease duration (3). Most of these characteristics were also present in our older asthmatic population, and the more severe disease progression among

the elderly in our study population may be related to such factors.

Strengths and limitations

A distinct strength of this study is that all participants were real-life asthma patients. Diagnoses were more accurate in this study than in studies that are population based and include patients with self-reported asthma diagnoses. However, the retrospective study design is a limitation. For comparing the clinical progression between elderly and non-elderly asthmatics, studies with a larger number of patients should be designed to better record the course of the disease in both groups.

In conclusion, this study revealed not only demographic and clinical differences between older and younger asthmatics but also revealed that aeroallergen sensitivity cannot be ignored, albeit to a lesser extent in the older group. Additionally, the results indicated a potentially high rate of underdiagnosis among male elderly asthmatics in our geographical location. However, it should be considered that these results cannot be generalized to all populations. We hope that the results of the current study will trigger further multicenter studies with larger sample sizes to define more generalized differences in the characteristics of elderly asthmatics' in our country.

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RESEARCH

DETERMINANTS OF HEALTH-RELATED QUALITY OF LIFE IN ELDERLY HEMODIALYSIS PATIENTS

Abstract

Introduction: Very limited data about the quality of life in elderly hemodialysis patients are available. The aim of this study was to identify clinical and demographic determinants that influence health-related quality of life in elderly hemodialysis patients.

Materials and Method: In total, 94 hemodialysis patients participated in the study. The participants were divided into two groups according to age: elder group (age of ≥60 years) and younger group (age of<60 years). Demographic and clinical data including age; gender; marital status; education period; duration of hemodialysis; comorbidity; and serum levels of hemoglobin, albumin, parathyroid hormone, aspartate transaminase, alanine transaminase, calcium, phosphate , urea, and creatinine were recorded. Health-related quality of life was measured using Nottingham Health Profile. Depression was evaluated using Beck Depression Inventory. Comparison of the data was performed between the groups. Determinants for quality of life were identified using multiple logistic regression analysis.

Results: Elderly hemodialysis patients (n=39) had significantly higher scores in energy, pain, and physical activity domains than controls (n=55; p=0.008, p=0.016, p=0.042, respectively). In elderly hemodialysis patients, Beck Depression Inventory was significantly associated with the six domains of Nottingham Health Profile, excluding energy domain (p<0.05). Quality of life was significantly affected by factors including serum levels of hemoglobin, albumin and phosphate ; being married and number of comorbidities (p<0.05). The primary determinant of quality of life in elderly hemodialysis patients seems to be depression.

Conclusion: Quality of life in elderly hemodialysis patients is largely influenced by depression, some metabolic parameters, and number of comorbidities.

Key Words: Aged; Renal Dialysis; Quality of life; Depression

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ARAŞTIRMA

YAŞLI HEMODİYALİZ HASTALARINDA SAĞLIKLA İLİŞKİLİ YAŞAM KALİTESİNİN BELİRLEYİCİLERİ

Öz

Giriş: Yaşlı hemodiyaliz hastalarında yaşam kalitesi hakkında çok sınırlı veri bulunmaktadır. Bu çalışmanın amacı yaşlı hemodiyaliz hastalarında yaşam kalitesini etkileyen demografik ve klinik belirleyicileri tanımlamaktır.

Gereç ve Yöntem: Çalışmaya toplam 94 hemodiyaliz hastası katıldı. Katılımcılar yaşa göre iki gruba ayrıldı: yaşlı grubu (yaş ≥60) ve genç grubu (yaş<60). Yaş, cinsiyet, medeni durum, eğitim düzeyi, hemodiyaliz süresi, komorbidite, serum hemoglobin, albumin, paratiroid hormon, aspartat transaminaz, alanin transaminaz, kalsiyum, fosfat, üre ve kreatinini içeren klinik ve demografik veriler kaydedildi. Sağlıkla ilişkili yaşam kalitesi Nottingham Sağlık Profili kullanılarak ölçüldü. Beck Depresyon Envanteri kullanılarak depresyon değerlendirildi. Gruplar arasında verilerin karşılaştırılması yapıldı. Yaşam kalitesi için belirleyiciler çoklu lojistik regresyon analizi kullanılarak belirlendi.

Bulgular: Yaşlı hemodiyaliz hastaları (n=39) anlamlı olarak enerji, ağrı ve fiziksel aktivite alanlarında kontrol grubundan daha yüksek skorlara sahipti. (n=55; p=0.008, p=0.016, p=0.042, sırasıyla). Yaşlı hemodiyaliz hastalarında, Beck Depresyon Envanteri Nottingham Sağlık Profili'nin enerji alanı dışındaki altı alanıyla istatistiksel olarak anlamlı derecede ilişkili bulundu (p<0.05). Yaşam kalitesi serum hemoglobin, albumin ve fosfat düzeyinden, evli olmak ve komorbidite sayısını içeren faktörlerden anlamlı olarak etkilenmekteydi (p<0.05). Yaşlı hemodiyaliz hastalarında yaşam kalitesinin primer belirleyicisi depresyon olarak görünmektedir.

Sonuç: Yaşlı hemodiyaliz hastalarında yaşam kalitesi, büyük oranda depresyon, bazı metabolik parametreler ve komorbidite sayısından etkilenmektedir.

Anahtar Sözcükler: Yaşlı; Renal diyaliz; Yaşam Kalitesi; Depresyon



INTRODUCTION

Prevalence of chronic kidney disease in elderly patients is increasing worldwide. Chronic kidney disease is associated with physical, emotional, psychological, and economic sequelae that affect not only the patients but also their families and the society. Majority of the chronic kidney disease patients undergo some form of renal replacement therapy such as renal transplant, hemodialysis, or peritoneal dialysis. Although hemodialysis is a life-saving therapy that increases survival of patients with chronic kidney disease, hemodialysis negatively affects the patients' independent living, psychosocial and mental status, and social life (1).

Older people often have multiple health problems. In addition, this population are more vulnerable to depression than the general population (2). Following hemodialysis treatment, an older patient with preexisting multiple comorbidities and limited physiological reserves is challenged by the new medical condition. The presence of chronic disease and depression are closely associated with poor quality of life in elderly population (3). Additionally, metabolic and nutritional factors including body mass index and serum levels of albumin and hemoglobin are linked with poor quality of life and mortality in hemodialysis patients (4).

Although many studies have investigated the quality of life in hemodialysis patients, information about the quality of life, specifically in elderly hemodialysis patients, is limited. Turkmen et al (5) studied the factors associated with quality of life in elderly population with end-stage renal disease and revealed that depression and sleep quality were predictors for quality of life. Given the susceptibility of this population, much more studies are required to provide a proper healthcare. The aim of this study was to assess the clinical and demographic determinants of health-related quality of life in elderly hemodialysis patients.

MATERIALS AND METHOD

Study Design and Participants

This cross-sectional study was conducted at the dialysis department of -between January 2016 and December 2016. The hemodialysis patients recruited to the study were treated regularly (three times a week) in hemodialysis unit of a single tertiary hospital. All patients (n=120) who were regularly treated at this unit were reviewed according to study criteria.. In total, 94 hemodialysis patients were enrolled for the study. Inclusion criteria were as follows: 1) undergoing hemodialysis at least thrice a week for >3 months and 2) being able to read and understand the questionnaire. Patients who had cognitive impairment and uncontrolled systemic diseases were excluded from the study. The participants were divided into two groups according to age: elder group (age of ≥60 years) and younger group (age of<60 years). Comparison of the groups was performed in terms of demographic data, metabolic function, health-related quality of life, and depression level. Determinants of the health-related quality of life in older patients were assessed.

The study protocol was approved by the local research ethics committee. The study adhered to the guidelines of the Declaration of Helsinki and informed consent was obtained from all the participants.

Assessment Tools

Health-related quality of life was assessed using the Nottingham Health Profile (NHP). NHP is a questionnaire designed to measure the

social and personal effects of an illness. It has six categories comprising 38 items: NHP-energy, NHP-pain, NHP-emotional reaction, NHP-sleep, NHP-social isolations (SI), and NHP-physical mobility (PM). The scores of each component are weighted and range from 0 (no problems) to 100 (maximum problems). The respondent answers "yes" if the statement adequately reflects the current status or feeling, or "no" if otherwise. Turkish adaptation of the NHP has been performed (6).

The severity of depression was assessed using Beck Depression Inventory (BDI), which is a 21-item self-report scale, developed by Beck et al. (7). Items in the scale are rated from 0 to 3 in the increasing order of severity. Item scores are totaled and can range from 0 to 63. Higher scores correlate with more severe depression. The validity and reliability of the Turkish version of the BDI has been established (8). The BDI score of 17 or higher was considered as the cutoff value for the diagnosis of depression.

The abovementioned two assessment tools were applied by the same investigator, together with a questionnaire to obtain the demographic and clinical data and laboratory tests including age; gender; marital status; smoking; education period; duration of hemodialysis; and serum levels of hemoglobin, albumin, parathyroid hormone, aspartate transaminase, alanine transaminase, calcium, phosphate, urea, and creatinine.

Statistical Analysis

Data are presented as mean±standard deviation and proportions for continuous and categorical variables, respectively. Chi-square test was applied for comparison of proportions. The Student's t-test was used to compare the mean values of continuous variables. If the distribution of the continuous variables was not normal, the Mann–Whitney test was used. First, univariate analysis was utilized between each predictor and NHP subscales to identify the variables that were included in the multivariate model. The variables with a p value of<0.20 in univariate analysis that were individually identified as significant predictors, were entered into the multivariate model. Multiple linear regression analysis was conducted to identify the factors that significantly influenced NHP subscales. No more than 4 variables were entered into the multivariate model per NHP subscales. The stepwise method was used to compare the influence of different factors and their types on NHP subscales. Bivariate correlations were analyzed using Pearson correlation coefficients to identify related variables. Collinearity of predictors was considered, and the predictor variables that closely correlated were excluded from the regression analyses. The level of significance was set at a p value of<0.05 (two-tailed). SPSS for Mac, Version 20.0 (SPSS, Chicago, IL) was used to conduct the statistical analyses.

RESULTS

In total, 39 subjects with a mean age of 71±8.0 years and 55 controls with a mean age of 43.9±11.0 years participated in the study. Elderly hemodialysis patients had higher body mass index values and shorter education period compared with controls (p=0.001 and p<0.001, respectively). Cardiac disease and diabetes mellitus were more frequent in elderly patients (p=0.032 and p=0.049, respectively). Hemoglobin levels were lower in elderly hemodialysis patients than in controls (p=0.020). Furthermore, there were significant differences in other demographic and clinical characteristics between the groups (Table 1).



Table 1. Characteristics of elderly hemodialysis patients and controls.

Characteristics	Elderly hemodialysis patients (age ≥60 years) (n=39)	Controls (age 18-59 years) (n=55)	*p*
Age (years)*	71.0±8.0	43.9±11.0	**<0.001**
Gender (female/male)	26/13	25/30	0.059
BMI (kg/cm²)*	26.3±3.6	23.6±3.6	**0.001**
Marital status (married/not married)	21/18	31/24	0.809
Education period (years)*	2.2±2.9	5.3±3.7	**<0.001**
Duration of hemodialysis (years)*	5.7±5.2	7.6±6.7	0.158
Comorbidities			
Arterial hypertension	25 (64.1%)	32 (58.2%)	0.563
Diabetes Mellitus	15 (38.5%)	11 (20.0%)	**0.049**
Cardiac Disease	12 (30.8%)	7 (12.7%)	**0.032**
Cerebrovascular Disease	2 (5.1%)	2 (3.6%)	0.724
Number of comorbidities*	1.4±1.0	1.0±0.9	0.077
Laboratory Tests*			
Hemoglobin, g/dL	10.3±1.1	11.0±1.6	**0.020**
Creatinine, mg/dL	6.1±1.5	6.6±2.1	0.191
Albumin, mg/dL	3.7±0.3	3.7±0.5	0.392
Calcium, mg/dL	8.6±0.6	8.5±0.9	0.531
Phosphate, mg/dL	5.2±1.2	5.2±1.6	0.953
PTH, pg/mL	391.6±365.0	578.4±572.7	0.057
ALT, U/L	13.3±10.4	13.6±7.3	0.891
Beck Depression Inventory*	13.4±14.6	14.4±12.4	0.732

* Mean±standard deviation.
BMI, Body Mass Index; PTH, Parathormone; ALT, Alanine aminotransferase.

Table 2 shows the comparison of averages for the six domains of NHP between the groups. Elderly hemodialysis patients had significantly poorer scores in energy, pain, and physical activity domains of NHP compared with controls (p=0.008, p=0.016, and p=0.042, respectively).

While identifying predictors for the NHP domains in elderly hemodialysis patients, the multiple linear regression analysis showed that Beck depression scores had a positive relationship with five domains including pain, emotional reaction, social isolation, sleep, and physical activity. Serum levels of hemoglobin and albumin showed an inverse relationship with the energy domain (p<0.05). Additionally, serum level of albumin also showed an inverse relationship with physical activity (p<0.05).

The number of comorbidities positively correlated with pain domain and physical activity ($p<0.05$). Phosphate level showed a negative relationship with the sleep domain ($p<0.05$). Being married had a negative relationship with social isolation ($p<0.05$). Table 3 shows how each NHP domain was significantly associated with the variables.

Table 2. Comparison of mean scores* in Nottingham Health Profile subscales between elderly hemodialysis patients and controls.

Characteristics	Elderly hemodialysis patients (age ≥60 years) (n=39)	Controls (age 18-59 years) (n=55)	*p*
Energy	82.0±34.9	59.3±45.6	**0.008**
Pain	40.3±37.4	22.7±31.8	**0.016**
Emotional Reaction	33.5±34.8	39.9±29.3	0.340
Sleep	50.2±40.7	41.8±41.3	0.329
Socialization	16.8±26.5	22.5±32.8	0.357
Physical Activity	42.3±40.6	26.5±33.0	**0.042**

*Mean±standard deviation.

Table 3. Multiple linear regression analysis of the factors that influence the Nottingham Health Profile subscales in elderly hemodialysis patients.

Subscales	Variables	*p*	β	R^2
Energy	Hemoglobin	0.050	-8.982	0.377
	Albumin	0.054	-27.987	
Pain	Beck Depression Inventory	**<0.001**	1.529	0.529
	Number of comorbidities	**0.032**	9.179	
Emotional reaction	Beck Depression Inventory	**<0.001**	1.562	0.430
Sleep	Beck Depression Inventory	**0.001**	1.410	0.348
	Phosphate	**0.023**	-10.396	
Socialization	Beck Depression Inventory	**0.007**	0.673	0.477
	Being married	**0.001**	-23.496	
Physical activity	Beck Depression Inventory	**<0.001**	1.645	0.688
	Number of comorbidities	**0.010**	10.460	
	Albumin	**0.028**	-26.762	



DISCUSSION

This study assessed the health-related quality of life in elderly hemodialysis patients. Pain, energy, and physical activity domains of NHP were found to be poorer in elderly hemodialysis patients than in controls. The results showed that the primary determinant of quality of life in elderly hemodialysis patients seems to be depression, which was associated with all of the NHP domains, excluding energy domain. The metabolic parameters including serum levels of albumin, hemoglobin and phosphate; number of comorbidities and being married were among the other major factors affecting health-related quality of life in hemodialysis patients.

The present study revealed that elderly hemodialysis patients had poorer quality of life in pain, energy, and physical activity domains of NHP. Similar to the present study, Deoreo (9) found that physical function domain of quality of life was lower than the general population. The present findings, which were consistent with the results in the study, showed that pain domain was higher in elderly hemodialysis patients. (5,10-11). This population has to deal with several comorbidities and suffers musculoskeletal problems. So the pain is an important contributory factor in their quality of life. To boost quality of life in elderly hemodialysis patients, clinicians may consider resource of pain and comorbidities.

Depression is a well-known issue that is related with the quality of life. Several previous studies have demonstrated the importance of depression in the quality of life of hemodialysis patients (12,13). In this study, depression was found to be one of the most important determinants for NHP that affected five domains, including pain, social isolation, emotional reaction, sleep, and physical activity. Similarly, Kao et al (14) showed that depression scores were significantly and strongly inversely associated with all the domains of quality of life. High depression scores seemed to exert a major impact on the quality of life in elderly hemodialysis patients. So, early diagnosis and (associated factor)treatment strategies focusing on depression may improve the quality of life in elderly hemodialysis patients.

The present study showed that the presence of comorbidities was associated with the pain domain of quality of life in elderly hemodialysis patients. Similar to our results, several earlier studies described a negative correlation between comorbidities and quality of life in general hemodialysis patients (15,16). However, Wan et al. did not find a correlation between the number of comorbidities and quality of life (1). Multi-morbidity is more commonly seen in elderly population. As a result, elderly hemodialysis patients may be more prone to suffer from pain frequently.

Association between the metabolic profile and health-related quality of life in hemodialysis patients has been investigated in the previous studies. Feroze et al. (4) found that low serum levels of albumin was associated with worse health-related quality of life. In line with this finding, we also found that the serum levels of hemoglobin and albumin had negative relationship with the energy domain of health-related quality of life. In the study of Evans et al. (17), improvement in hematological parameters of anemic hemodialysis patients was significantly associated with better quality of life parameters, including energy, health status, well-being, and psychological state. The elderly population have metabolic imbalance, more frequently. Therefore, metabolic parameters should be carefully considered for increasing the

quality of life in elderly hemodialysis patients by multidisciplinary team approach.

Poor sleep quality is frequently observed in hemodialysis patients and it has been shown to be related with advanced age, depression, cardiac diseases, and poor quality of life (18). Additionally, Kutner et al. (19) showed that elderly hemodialysis population is prone to poor sleep quality, which is related to their psychological state. According to the present findings, depression is related with worse sleep domain score of NHP. It means that depression has also impact on quality of life by means of impairing sleep quality. The present study also showed that phosphate level correlated positively with the sleep domain of quality of life. Relation between sleep quality and phosphate level was also determined in an earlier study by Emami Zeydi et al. (20). They demonstrated that higher phosphate level correlated with sleep quality in the end-stage renal disease population. Higher phosphate level may be related with pruritus. As a result, poor sleep quality and quality of life may be seen in elderly hemodialysis population. In this population, preventing hyperphosphatemia and efficient depression treatment may result in an increase in the sleep quality and quality of life.

Some studies have shown significantly impaired physical function in dialysis patients compared with general population. Anemia, changes in protein catabolism, inflammatory state, and a decrease in protein synthesis may potentially cause decreased physical function (21). Increased serum level of albumin was found to be associated with better physical activity in the present study. Physical function was lower in hemodialysis patients, along with increased risks for comorbidities such as diabetes mellitus, coronary artery disease, stroke, and vascular disease (22). In agreement with this finding, the study revealed that higher number of comorbidities were related with poorer physical activity domain of NHP in elderly hemodialysis patients. In this population, a multidisciplinary approach with close monitoring is needed for the evaluation of disease situation. Metabolic profile does not explain all disease burden and mental well-being. However, metabolic profile such as albumin, hemoglobin are independent variables on quality of life. To attain high quality of life in elderly hemodialysis patients, metabolic profile may be taken into consideration in the treatment algorithms.

In comparison with general population, socialization is affected in hemodialysis patients (23). In the present study, it was found that the social isolation domain of NHP had a negative correlation with being married. In parallel to the present study, Sağduyu et al (24) showed that being married was found to be a positive factor for the quality of life. However, in most of the previous studies (25), marital status was not associated with quality of life. .

There were some limitations in the present study. First, the health-related quality of life was assessed using a generic measure. NHP might not be sufficiently sensitive for hemodialysis patients. In future studies, disease specific measures may help in evaluating the quality of life of this population. Second, the study sample was small, thus limiting the statistical ability to determine significant correlations. Finally, this study was cross-sectional and did not have a healthy control group.

In conclusion, the results of this study indicate that the quality of life in elderly hemodialysis patients is largely influenced by depression, some metabolic parameters, and the number of comorbidities. Clinicians should consider these factors to improve their quality of life.



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RESEARCH

QUALITY OF LIFE AND FACTORS ASSOCIATED WITH IT IN ELDERLY WOMEN WITH URINARY INCONTINENCE

Abstract

Introduction: Urinary incontinence, which affects women of all age groups, is a crucial health problem, affecting the quality of the life and incidence of it increases especially with aging.

Materials and Method: This study was designed as a cross-sectional research to determine to what extent the quality of life of women with urinary incontinence was affected and which factors were involved. The study included women aged 65 years and over who were admitted to a urology outpatient clinic at a provincial hospital with a complaint of urinary incontinence between December 1, 2016 and May 31, 2017. The study data such as demographic characteristics, reproductive features, and complaints related to urinary incontinence were collected using a questionnaire and the Incontinence Quality of Life Scale. Descriptive statistics and Kruskal–Wallis and Mann–Whitney U tests were used in data analysis.

Results: Incontinence Quality of Life Scale scores significantly decreased in association with age, smoking status, episiotomy status, and increased body mass index; therefore, quality of life was negatively affected in these women ($p<0.05$). Educational level of the women, presence of chronic disease, type of urinary incontinence, having delivered a baby weighing 4 kg or over, and duration and frequency of urinary incontinence had no statistically significant effect on the quality of life of women ($p>0.05$).

Conclusion: Urinary incontinence negatively affects the quality of life of elderly women.

Key Words: Aged; Urinary incontinence; Quality of life

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ARAŞTIRMA

ÜRİNER İNKONTİNANSLI YAŞLI KADINLARDA YAŞAM KALİTESİ VE ETKİLEYEN FAKTÖRLER

Öz

Giriş: Üriner inkontinans her yaş grubundaki kadınları etkilemekle birlikte özellikle yaşlanma ile birlikte sıklığı artan ve yaşam kalitesini etkileyen, önemli bir sağlık problemidir.

Gereç ve Yöntem: Üriner inkontinans yaşayan kadınların yaşam kalitelerinin hangi düzeyde etkilendiğini ve etkileyen faktörleri belirlemek amacıyla yapılan çalışma kesitsel türdedir. Bir ildeki bir hastanenin üroloji polikliniklerine 1 Aralık 2016- 31 Mayıs 2017 tarihleri arasında üriner inkontinans şikayeti ile başvuran 65 yaş ve üzeri kadınlar örneklemi oluşturmuştur. Araştırmanın verileri, kadınların sosyo-demografik özellikleri, doğurganlık özellikleri ve üriner inkontinans ile ilişkili yakınmalarını saptamaya yönelik anket formu ve "İnkontinans Yaşam Kalitesi Ölçeği" ile toplanmıştır. Verilerin analizinde tanımlayıcı analiz yöntemleri, Kruskal Wallis, ve Mann Whitney U testi kullanılmıştır.

Bulgular: Kadınlarda yaş, sigara içme, epizyotomi uygulanma durumu, inkontinans miktarı ve beden kitle indeksindeki artışla birlikte inkontinans yaşam kalitesi ölçeği puanlarının anlamlı düzeyde düştüğü ve dolayısı ile yaşam kalitelerinin negatif yönde etkilendiği belirlenmiştir ($p<0.05$). Kadınların eğitim düzeyi, kronik hastalık varlığı, üriner inkontinans tipi, doğum sayısı, 4 kg ve üzeri bebek doğurma, idrar kaçırma süresi ve yaşanan üriner inkontinans sıklığına göre yaşam kalitesi etkilenme durumu karşılaştırıldığında istatistiksel olarak anlamlı bir farklılık görülmemektedir ($p>0.05$).

Sonuç: Üriner inkontinans yaşlı kadınların yaşam kalitesini olumsuz yönde etkilemektedir.

Anahtar Sözcükler: Yaşlı; Üriner İnkontinans; Yaşam kalitesi.

INTRODUCTION

The proportion of elderly in the general population is increasing worldwide, including Turkey. According to Turkish Statistical Institute data, people aged ≥65 years account for 8.2% of the population (1). Health problems unfavorably affecting the quality of life such as cancer, heart failure, renal failure, anemia, chronic obstructive pulmonary disease, diabetes mellitus, dementia, Parkinson's disease, falls, accidents, osteoporosis, visual and hearing impairment, tooth problems, nutritional disorders, taste and smell disorders, chronic pain, sleep disturbances, and dysregulation of body temperature occur with advancing age due to improvements in demographic features and an increase in the life expectancy (2,3). Along with these health problems, urinary incontinence (UI) is one of the most important health problems that causes severe complications and negatively affects the quality of life of patients. The prevalence of UI in Turkey ranges from 30% to 57.1% in women aged ≥65 years, and the prevalence rates range from 12.5% to 68.9% in other countries (4-7).

Many factors cause UI, including age, sex, low income and educational level, employment status, smoking and alcohol consumption, presence of chronic disease, chronic constipation, gravidity, parity, episiotomy status during delivery, history of bladder prolapse, cough, body mass index (BMI), and vaginal infections (4,6,8). Along with these risk factors, individuals with UI experience embarrassment and suffer from low self-esteem; their social lives become unfavorable owing to not participating in activities such as taking trips; they experience dissatisfaction with life and decrease in emotional and psychological well-being; and their quality of life is negatively affected due to social isolation, depression, and anxiety (8, 9). UI also causes a decrease in fluid consumption, lack of hygiene practices, and pressure ulcers and perineal dermatitis due to loss of skin moisture and skin irritation (10).

Considering the increasing prevalence of UI with an increase in age, higher prevalence rates in females, and impairment of quality of life in these individuals, the present study aimed at evaluating to what extent the quality of life of women suffering from UI is affected and which factors are involved.

MATERIALS AND METHOD

This cross-sectional study included women aged ≥65 years who were admitted to the urology outpatient clinics at a hospital located in the Central Anatolia Region of Turkey with a complaint of UI between December 1, 2016 and May 31, 2017. Study sample was not selected in the study, and regardless of the incontinence type, elderly women who could establish verbal communication, consented to participate, and who had a fair general health status comprised the study group. During data collection, individuals who had lost their ability of responding to the questions due to changes in the clinical condition, had withdrawn their consents, and provided incomplete or contradictory responses to the questionnaire or scale items were excluded. The study data such as demographic characteristics of women, reproductive features, and complaints related to UI were collected using a questionnaire and Incontinence Quality of Life Scale (I-QOL).

Data obtained from the research were analyzed on computer using descriptive statistics and the Kruskal–Wallis and Mann–Whitney U tests. The level of statistical significance was set at $p<0.05$.

Incontinence Quality of Life Questionnaire: I-QLQ was developed by Wagner et al. in 1996 (11). Validity and reliability analysis of the Turkish version of the scale was conducted by Özerdoğan and Kızılkaya in 2003 (12). I-QLQ comprises three subscales: avoidance and limiting behavior, psychological impact, and social embarrassment. It comprises 22 questions, each of which contains 5 Likert-type items. High scores indicate better quality of life than low scores (11,12). The Cronbach's alpha coefficient of the quality of life questionnaire was determined to be 0.94.



Study limitations

Among factors causing UI, chronic constipation, bladder prolapse, cough, alcohol consumption, and vaginal infections could not be evaluated because the elderly women did not provide sufficient responses to these questions. Similarly, these women may have accurately recalled only some characteristics related to the reproductive history and UI.

Procedure

Ethics committee approval was obtained for this research from Ahi Evran University Ethics Committee and written informed consent was obtained from all participants.

RESULTS

We included a total of 427 elderly women with UI. Of these, 56.9% were aged 56–69 years, 63.7% were married, 47.8% were literate or elementary school graduates, 94.4% had never been employed, and 50.1% had BMI≥25.0 kg/m^2. When the women were evaluated according to the UI type, 208 (48.7%) had urgency UI, 130 (30.4%) had stress UI, and 89 (20.8%) had mixed UI; 32.6% of the women suffered from UI since the last 1–2 years, and 42.6% experienced one episode of UI per week (Table 1).

There was a difference in the quality of life of women with UI between different age groups. Accordingly, there are statistically significant decreases in median overall scores in the quality of life scale and median scores in the subscales of limiting behavior and psychosocial impact with an increase in the age ($p<0.05$) (Table 2).

When the quality of life was evaluated according to the educational level, no statistically significant relationship was found between educational level and the scores in the quality of life scale ($p>0.05$) (Table 2). The median overall score in the scale and limiting behavior subscale was significantly lower for women who smoked compared with those who did not ($p<0.05$) (Table 2).

Although overall I-QOL and subscale scores were lower for women with a chronic disease, presence of a chronic condition did not produce a significant change in the scores ($p>0.05$) (Table 2).

There was a relationship between BMI and median overall I-QOL score and median scores in limiting behavior and psychosocial impact subscales ($p<0.05$). The statistical analysis showed that women with BMI≥25.0 kg/m^2 achieved significantly lower overall I-QOL score and lower scores in limiting behavior and psychological impact subscales ($p<0.05$) (Table 2).

There was no statistically significant relationship when the quality of life of women was evaluated according to the UI type, number of deliveries, having delivered a baby weighing ≥4 kg, and UI frequency ($p>0.05$) (Table 3). When the quality of life of women with UI was evaluated according to the episiotomy status, women who underwent episiotomy had lower scores compared with those who did not. In psychosocial impact and limiting behavior subscales, there was a statistically significant difference between women who underwent episiotomy and those who did not, wherein the quality of life of women who did not appeared to be better ($p<0.05$) (Table 3). Median overall score and median scores in the subscales were significantly lower for women with a large amount of UI compared with those with a small–moderate amount ($p<0.05$) (Table 3). Although women with UI for more than 11 years achieved lower overall scores and lower scores in the subscales, this did not produce a significant difference between quality of life scores of the individuals ($p>0.05$) (Table 3).

Median scores of women in the subscales of I-QOL scale were as follows: limiting behavior, 19 (9–36); psychological impact, 26 (11–45); limitation in social life, 13 (5–25); and median overall score in I-QOL, 19 (9–36) (Table 4).

Table 1. Socio-demographic features and characteristics of urinary incontinence in elderly women (n=427).

Characteristics	n	%
Age (years)		
65–69	243	56.9
70–74	102	23.9
75–79	42	9.8
>80	40	9.4
Marital Status		
Married	272	63.7
Widowed/Divorced	155	36.3
Education Status		
Illiterate	166	38.9
Literate/Elementary School	204	47.8
Secondary/High School	57	13.3
Occupation		
Employed	24	5.6
Unemployed	403	94.4
Body Mass Index		
18.5–24.9	213	49.9
≥25.0	214	50.1
Type of Urinary Incontinence		
Urgency	208	48.7
Stress	130	30.4
Mixed	89	20.8
Frequency of Urinary Incontinence		
Once a day	116	27.2
A couple of times a week	182	42.6
A couple of times a month	129	30.2
Duration of Urinary Incontinence (years)		
<1	108	25.3
1–2	139	32.6
3–5	87	20.4
6–10	74	17.3
>11	19	4.4



Table 2. Distribution of median overall and subscale scores in the I-QOL scale according to sociodemographic features and other parameters of elderly women.

I-QOL	Avoidance and Limiting Behaviors	Psychosocial Impact	Social Embarrassment	Total I-QOL
Age (years)				
65–69	224.60	220.02	219.92	223.96
70–74	218.21	224.6	224.15	221.50
75–79	169.12	201.74	178.99	177.07
>80	184.74	163.82	187.76	172.02
Significance	**KW=9.658**	**KW=8.320**	KW=5.202	**KW=10.289**
Test	**P=.022**	**P=.040**	P=.093	**P=.016**
Educational Level				
Illiterate	218.94	214.49	214.67	215.52
Literate/Elementary School	207.09	208.99	209.01	206.54
Secondary/High School	224.34	230.50	229.93	236.25
Significance	KW=1.316	KW=1.363	KW=1.298	KW=2.629
Test	P=.518	P=.506	P=.523	P=.269
Smoking Status				
Smoker	208.30	211.87	210.06	208.59
Non-smoker	241.65	224.32	233.12	240.23
Significance	Z=-2.110– -	Z=**-**.786	Z=−1.459	**Z=−1.997**
Test	**P=.035**	P=.432	P=.145	**P=.046**
Chronic Disease				
Present	214.89	214.22	215.32	214.06
Absent	207.88	212.46	204.86	213.56
Significance	Z=−.391	Z=−.098	Z=−.584	Z=−.028
Test	P=.695	P=.922	P=.559	P=.977
Body Mass Index*				
18.5–24.9	230.08	227.91	223.65	229.62
≥25.0	197.39	199.63	204.03	197.86
	Z=−2.747	**Z=−2.371**	Z=−1.649	**Z=−2.662**
	P=.006	**P=.018**	P=.099	**P=.008**

***** Calculated as weight in kilograms divided by the square of height in meters.

Table 3. Distribution of median overall and subscale scores in I-QOL scale according to reproductive history and features related to urinary incontinence.

I-QOL	Avoidance and Limiting Behaviors	Psychosocial Impact	Social Embarrassment	Overall I-QOL
Type of Incontinence				
Urgency	215.06	219.16	211.09	213.97
Stress	217.75	218.76	227.99	221.91
Mixed	206.04	194.99	200.35	202.52
Significance Test	KW=.509 P=.775	KW=2.676 P=.262	KW=2.895 P=.235	KW=1.307 P=.520
Number of Births				
1–2	216.05	229.58	236.69	229.30
3	201.35	206.72	187.33	193.77
4	210.18	214.74	208.77	212.79
≥5	219.80	213.40	221.52	219.10
Significance Test	KW=1.467 P=.690	KW=1.005 P=.800	KW=6.418 P=.093	KW=3.326 P=.344
Presence of Episiotomy				
Yes	198.67	199.75	205.73	198.62
No	229.26	228.18	222.24	229.31
Significance Test	**Z=−2.571 P=.010**	**Z=−2.384 P=.017**	Z=−1.387 P=.165	**Z=−2.572 P=.010**
Neonate≥4 kg in weight				
Yes	203.71	198.12	207.20	199.32
No	218.91	221.58	217.25	221.01
Significance Test	Z=−1.195 P=.232	Z=−1.841 P=.066	Z=−.789 P=.430	Z=−1.701 P=.089
Frequency of Urinary Incontinence				
Once a day	193.83	191.57	203.53	191.75
A couple of times a week	221.14	222.03	217.11	220.99
A couple of times a month	222.07	222.84	219.03	224.14
Significance Test	KW=4.292 P=.117	KW=5.282 P=.071	KW=1.174 P=.556	KW=5.242 P=.073
Incontinence Amount				
Small	229.87	229.65	231.48	232.48
Moderate	202.82	203.70	201.91	200.87
Large	195.90	194.89	193.67	193.10
Significance Test	**KW=6.318 P=.042**	**KW=6.229 P=.044**	**KW=7.699 P=.021**	**KW=8.514 P=.014**
Duration of Urinary Incontinence				
<1 year	215.21	215.18	209.04	216.70
1–2 years	212.77	202.66	200.87	206.37
3–5 years	221.12	222.32	234.40	221.42
6–10 years	222.55	233.14	230.97	226.46
>11 years	150.24	177.61	178.76	171.95
Significance Test	KW=5.785 P=.216	KW=5.028 P=.284	KW=7.123 P=.130	KW=3.867 P=.424



Table 4. Distribution of quality of life scores in women with urinary incontinence.

I-QOL	Number of items	Median Score (Min–Max)
Limiting behavior	8	19 (9–36)
Psychosocial impact	9	26 (11–45)
Social isolation	5	13 (5–25)
Overall Score	22	19 (9–36)

DISCUSSION

Urinary incontinence affects all age groups and is an important health problem; its prevalence increases with age, and it affects the quality of life. This condition can be caused by a decrease in bladder capacity observed in the lower urinary tract with an increase in age, residual urine volume, involuntary bladder contractions, and mobility disorders and a decrease in urethral resistance and circulating estrogen levels (5, 13). We showed a negative impact on the quality of life of women with an increase in age. Maral et al. (14) showed that women aged ≥65 years are 6.24 times more likely to experience UI than those aged 15–24 years, and Demirel and Akın (6) reported a higher prevalence of UI in women aged ≥80 years compared with that in those aged 65–69 years. Aylaz et al. (15) showed that incontinence negatively affected the quality of life, and social isolation dimension was the most commonly affected domain. The results of these studies are consistent with the findings of our study.

Ghafouri et al. (7) reported low educational level as an important risk factor for UI. Although there was no statistically significant relationship between the education level and overall I-QOL and subscale scores, the quality of life decreased with a decreasing educational level. It is considered that elderly women with a high education level have a better lifestyle and hygiene perception and are more likely to seek for solutions for their condition than those with a low education level.

Smoking plays an important role in all types of UI and is associated with a 2–3-fold higher risk of developing UI (16). Kirss et al. (17), and Amaral et al. (8) found a significant relationship between UI and the smoking status. They found that the quality of life of women who smoke is negatively affected.

Kirss et al. (17) reported a relationship between UI and DM, Amaral et al. (8) reported a relationship between UI and constipation and vaginal infections, Demirel and Akın (6) reported a relationship between UI and bladder prolapse, Ghafouri et al. (7) reported a relationship between UI and bronchial asthma, Kaşıkçı et al. (4) reported a relationship between UI and constipation, urinary tract infections, cough, genital prolapse, and cystocele, and Kocaöz et al. (18) reported a relationship between UI and heart, endocrine, respiratory, and urinary tract diseases. However, Kocaöz et al. (18) reported that no relationship existed between UI and hypertension, depression, allergy, and gastrointestinal disorders, and Tozun et al. (19) reported no significant relationship between Cerebrovascular events (CVE) and UI. We showed no significant effect of the presence of chronic disease on the quality of life score, although the quality of life was lower in women with a chronic disease (Table 2). Increasing prevalence of chronic diseases in the elderly population with the finding of a significant relationship between chronic diseases and UI may be important for the management of UI. Therefore, detailed studies investigating the relationship between chronic diseases and UI are recommended.

Obesity is an important risk factor for UI development. Some studies (13,20) in the literature suggest no significant relationship between BMI and UI; however, some studies (12,19) report an increase in the prevalence of UI with an increase in BMI. We found a relationship between BMI and median score in I-QOL scale. It was observed that the quality of life is negatively affected in women with a high BMI (≥25.0 kg/m^2).

Parity and delivering a baby weighing ≥4 kg are other two risk factors that affected the quality of life. We found that parity and delivering a baby weighing ≥4 kg did not negatively affect the scores in the quality of life scale. Bilgili et al. (21) reported that delivering a baby weighing ≥4 kg did not affect UI development and Ghafouri et al. (7) reported no relationship between UI and parity, whereas another studies have reported a significant relationship between UI and parity and delivering a baby weighing ≥4 kg (22). Demirel and Akın (6) reported that multiple gestations negatively affected the scores in the quality of life scale. As mentioned above, studies have reported variable results regarding the relationship between UI and parity and delivering a baby weighing ≥4 kg. This can be attributed to the fact that studies have not clearly established the role of pregnancy and delivery on pelvic organ support, although pelvic floor disorders are associated with pregnancy and delivery.

We found that 27.2% of women experienced UI once a day, 42.6% experienced UI a couple of times a week, and 30.2% experienced UI a couple times a month, and the frequency of UI did not negatively affect the quality of life of women, although the amount of UI had a significant effect on the quality of life. Bilgili et al. (21) reported that 38.8% of women aged ≥60 years experienced UI twice a month or more, and Maggi et al. (23) reported that women aged ≥65 years experienced UI everyday. Demirel and Akın (6) also reported that the frequency and amount of UI negatively affected the quality of life. Higher amount of UI is thought to negatively affect the quality of life in elderly women due to fear of smelling bad, feeling of uncleanliness, low self-esteem, decrease in self-respect, and deterioration of self-image.

Episiotomy refers to the incision of bulbo-cavernous muscles in the perineum to aid the protection of the tonus of the perineum and prevent undesirable tears during the delivery of the baby's head, and it is routinely performed to avoid tears in the perineum (24). Some features related to the reproductive history of a woman are known to be among the factors causing UI, and episiotomy is one of these factors. One studies suggest a relationship between UI and episiotomy and its effects on the quality of life (25); however, some studies (6,21) report no significant impact on the quality of life. We found that episiotomy negatively affected overall scores in the quality of life scale and scores in limiting behavior and psychological impact subscales.

Despite the expectation of poorer quality of life in women with a longer duration of UI, we found that the duration of UI had no negative effect on the quality of life of women. The results of the study by Özerdoğan and Kızılkaya (12) are comparable with the findings of our study, and duration of UI does not affect the quality of life.

The quality of life is impaired in patients with UI, mainly in the psychosocial domain (6,8,9,14). Özerdoğan and Kızılkaya (12) used the I-QOL scale to evaluate the quality of life of women with UI aged ≥20 years and found a mild–moderate effect on the quality of life. Amaral et al. (9) reported that a majority of women (99.2%) experienced negative effects of UI in their lives. Ghafouri et al. (7) used International Consultation on Incontinence Questionnaire Short Form (ICIQ-SF) in their study and found that UI affected the quality of life in 79% of women with UI, and the magnitude of this effect varied from moderate to severe. Demirel and Akın (6) investigated women aged ≥65 years and reported negative effects of UI on the quality of life and suggested a significant

relationship between the UI type and overall I-QOL and subscale scores. We found that the quality of life of women was negatively affected, although there was no statistically significant relationship between the UI type and overall and subscale scores in the I-QOL scale.

Here, UI had negative effect on all dimensions of the quality of life in the I-QOL scale. Healthcare personnel should examine and observe elderly women, particularly the ones at risk, for the symptoms of UI and suggest treatment if diagnosed.

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RESEARCH

ARE THE BENEFITS OF PULMONARY REHABILITATION IN YOUNG AND ELDERLY PATIENTS THE SAME?

Abstract

Introduction: Pulmonary rehabilitation is an interdisciplinary and comprehensive program for patients with decreased daily life activity and symptomatic in addition to medical therapy. The study was aimed to investigate the difference between pulmonary rehabilitation achievements in young and elderly patients with chronic pulmonary diseases.

Materials and Method: Patients with chronic respiratory diseases who completed 8-week PR programme evaluated in a retrospective cohort study. Patients demographics, exercise capacity, quality of life score were obtained prior and after pulmonary rehabilitation were evaluated. Patients were evaluated in 2 groups; young (age <65 years) and elderly (age≥65 years) patients.

Results: A total of 73 patients, 58 men with mean age 61±10 was evaluated. There were 55 Chronic obstructive pulmonary disease, 8 bronchiectasis, 5 interstitial lung disease, 5 kyphoscoliosis. There were 42 patients in younger patient group and 31patients in elderly group. The distribution of chronic obstructive pulmonary disease and other chronic respiratory diseases, comorbidities, gender, oxygen treatment, Modified Medical Research Council dyspnea score, St.George's Respiratory Questionnaire score among young and elderly patients were similar (p>0.05). In both age groups after pulmonary rehabilitation, significant improvement in exercise capacity (p=0.001) and St.George's Respiratory Questionnaire score (p<0.05) was obtained.

Conclusion: In the present study we showed that there was no difference in pulmonary rehabilitation achievements between patients with chronic respiratory diseases under 65 years and older. Pulmonary rehabilitation is beneficial in elderly patients as an addition to medical treatment like younger patients.

Key Words: Aged; Exercise therapy; Frail elderly; Pulmonary Disease, Chronic Obstructive; Quality of life; Rehabilitation

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ARAŞTIRMA

GENÇ VE YAŞLI HASTALARDA PULMONER REHABİLİTASYONUN KAZANIMLARI AYNI MIDIR?

Öz

Giriş: Pulmoner rehabilitasyon, günlük yaşam aktivitesinde azalma ve tıbbi tedaviye ek olarak semptomatik olan kronik solunum hastaları için interdisipliner, kapsamlı bir programdır. Bu çalışmada genç ve yaşlı kronik akciğer hastalarında pulmoner rehabilitasyon kazanımları arasında farkın araştırılması amaçlanmıştır.

Gereç ve Yöntem: Kronik akciğer hastalığı olan ve 8 haftalık pulmoner rehabilitasyon programını tamamlayan hastalar retrospektif kohort çalışması ile değerlendirildi. Hastaların rehabilitasyon öncesi ve sonrası kaydedilen demografik özellikleri, egzersiz kapasiteleri ve yaşam kaliteleri değerlendirildi. Hastalar genç (65 yaş altı) ve yaşlılar (65 yaş ve üzeri)olmak üzere 2 grupta incelendi.

Bulgular: Yaş ortalaması 61±10 olan 58 erkek, toplam 73 hasta değerlendirildi. 55 Kronik obstrüktif akciğer hastalığı 8 bronşektazi, 5 interstisyel akciğer hastalığı, 5 kifoskolyoz hastası mevcuttu. Genç hasta grubunda 42, yaşlı hasta grubunda 31 hasta mevcuttu. Genç ve yaşlı hastalarda kronik obstrüktif akciğer hastalığı ve diğer kronik akciğer hastalıkları, eşlik eden hastalıklar, cinsiyetleri, oksijen kullanımı, St. George Solunum Anketi ve Modified Medical Research Council skor dağılımı benzerdi (p>0,05). Her iki yaş grubunda pulmoner rehabilitasyon sonrası, egzersiz kapasitesinde anlamlı artış (p=0.001) ve St. George Solunum Anketi skorunda anlamlı düzelme saptandı(p<0.05).

Sonuç: Kronik akciğer hastalığı olan 65 yaş altı ve 65 yaş üstü hastalar arasında,egzersiz kapasitesinde ve yaşam kalitesindeki pulmoner rehabilitasyonun sağladığı kazanımlarda herhangi bir fark olmadığı saptanmıştır. Pulmoner rehabilitasyon yaşlı hastalarda kronik akciğer hastalığı olan genç hastalar gibi tıbbi tedaviye ek olarak yararlıdır.

Anahtar Sözcükler: Yaşlı; Egzersiz tedavisi; Kırılgan yaşlılık; Akciğer hastalığı, Kronik Obstrüktif; Yaşam kalitesi; Rehabilitasyon

INTRODUCTION

Chronic respiratory diseases have led to increase in problems including mortality, morbidity and rising costs worldwide. In this context, the development of new approaches for non-pharmacologic treatments, such as pulmonary rehabilitation (PR), is essential. PR is a comprehensive and interdisciplinary programme for patients with decreased daily life activity and who are currently undergoing symptomatic and medical therapy. The primary goal was to reach a patient's optimal functional level and quality of life. PR programmes are evidence-based and designed according to the needs of each patient (1,2). PR is highly recommended for patients with chronic pulmonary disease.

There is no age limit in the selection of candidate patients for PR. The definition of old age is commonly accepted as 65 years. However, this definition varies across countries (3). Previous studies have compared the outcomes of PR among younger and elderly patients with chronic obstructive pulmonary diseases (COPD). Moreover, PR is also recommended for other chronic pulmonary diseases (4,5).

In this study, we aimed to evaluate the effectiveness of PR among young (age <65 years) and elderly (age ≥65 years) patients with chronic pulmonary diseases. Specifically, we aimed to answer the research question, "Are there any differences in exercise capacity and the impact on quality of life among young and elderly (age 65 years and older) patients involved in a PR programme for the treatment of chronic pulmonary disease?"

MATERIALS AND METHOD

The study was designed as a retrospective cohort study between May 2014 and December 2015 in the PR unit of a tertiary training hospital for chest diseases. It was approved by the Ethics Committee of the Sureyyapaşa Chest Disease and Thoracic Surgery Training Hospital. Ethical approval was in accordance with the Declaration of Helsinki. Written informed consent was obtained from the patients.

Patients

Patients with chronic respiratory diseases were enrolled in the PR programme in day-hospital setting. Meanwhile, patients with cognitive disorders, unstable cardiac, neurologic or orthopaedic diseases were not included in the PR.

Patients diagnosed as having COPD according to the Global Initiative Chronic Obstructive Pulmonary Disease (GOLD) and had not experienced worsening of respiratory symptoms and hospital admissions for at least 4 weeks prior to PR. Other recruitment criteria included age over 40 years, a forced expiratory volume (FEV 1) of <80% of the predicted value and a ratio of FEV 1 to forced vital capacity of ≤0.7 (6).

Patients with diseases other than COPD; bronchiectasis, interstitial lung disease (no patients received systemic corticosteroids), and kyphoscoliosis patients were referred to PR.

All patients underwent cardiological assessment prior to PR. Patients who completed the 8-week PR programme with chronic respiratory diseases were included in the study. Patients were excluded if they were candidates for surgery and had undergone a preoperative short-term PR or if they cannot perform walking test because they could only exercise in bed.

Measurements

The spirometry was performed using ZAN 300 pre- and post-PR. Body mass index (BMI) and fat-free mass index (FFMI) were calculated with bioelectrical impedance (Tanita Body Composition Analyser, Model TBF-300).

Measurement of Exercise Tolerance: Each patient's exercise capacity was evaluated using the Incremental Shuttle Walk Test (ISWT). Otherwise, if the exercise capacity was low and the burden of the disease was high, they were evaluated using the Six-Minute Walk Test (6MWT).



Incremental Shuttle Walk Test was used to measure the sub-maximal exercise capacity of each patient. ISWT was performed in accordance with the guidelines set by the European Respiratory Society/ American Thoracic Society (7). The modified Borg dyspnoea score and blood pressure was recorded before and after walking. The patients were instructed to walk between two cones with signals in time to a set of auditory beeps on a CD. The distance between the two cones was set at 10 m, and the walking speed was increased at 1-minute intervals. The test was ended if the patient felt too breathless to continue or when the patient failed to complete 10 m within the allowed time. Heart rate and oxygen saturation were monitored during the test (8).

6MWT was performed according to the guidelines set by the American Thoracic Society (9). The participants were instructed to walk back and forth in a 30 m corridor. The modified Borg dyspnoea score and blood pressure were recorded before and after walking. The walking distance at the end of 6 min was recorded. The test was repeated, and the best results were evaluated (10).

Questionnaires: Dyspnoea was assessed by the Modified Medical Research Council (mMRC). The St.George's Respiratory Questionnaire (SGRQ) was used for the assessment of health-related quality of life. The scores range from 0 (no impairment) to 100 (maximum impairment). The subcategory scores (symptoms, activity and impact) and total score were calculated (11,12). The Hospital Anxiety and Depression Questionnaire (HADS) was used to assess anxiety and depression. The questionnaire has 14 items, a person can score between 0 and 21 for either anxiety or depression (13). COPD Assessment Test (CAT)was applied to COPD patients (14).

PR programme: An 8-week (2 days/week) outpatient PR programme was delivered by three physiotherapists. Exercise programmes were tailored to each patient's initial exercise capacity. The intensity of the workload was 60–85 % of the maximal workload based on the results of the 6MWT and ISWT. Each session included cycle ergometer and treadmill training for 30 min, upper and lower limb strengthening and breathing exercises. The workload intensity was increased according to each patient's improvement. Bronchial clearance techniques and energy conservation methods were also added to the programme depending on the patients' complaints (15).

Patients receiving long-term oxygen therapy (LTOT) also received O2 during the PR sessions, other patients received O2 if SpO2 fell below 90%.

A written home exercise programme were given to all patients, who were encouraged to exercise at home apart from the designated session days. Patients' medical therapies were optimised, and the patients and their relatives were informed by educational sessions for inhaler medication techniques and diseases. Psychological and nutritional support were also provided for the patients as needed.

Data collection

Patients demographics, clinical and anthropometric data, spirometry, exercise capacity, QoL were obtained prior and after PR programme. Patients were evaluated in two groups; young (age <65) and older (age ≥65) patient groups.

Outcomes

The primary outcome was exercise tolerance, and the secondary outcome was QoL.

Statistical Analysis

The Mann–Whitney U-test and Student's t-test were used for analysing the continuous variables with non-parametric and parametric values, respectively. The chi-square test was applied for categorical variables (gender, co-morbidity) of both age groups. A p-value < 0.05 was accepted as statistically significant. Changes within the groups were analysed with the Wilcoxon test. The median with inter-quartile range was employed for non-parametric continuous variables, and mean ± standard deviation was used for parametric continuous variables. Count and percentage were used when applicable.

Table1. The demographic characteristics of PR patient (n=73).

Characteristics	
Age (mean±sd)	61±10
Gender, n (%)	
Female	15 (20.0)
Male	58 (80.0)
Chronic pulmonary disease, n (%)	
COPD	55 (75.0)
Non-COPD	18 (25.0)
Interstitial lung disease	5 (7.0)
Kyphoscoliosis	5 (7.0)
Bronchiectasis	8 (11.0)
Smoking (packyear) median (IQR)	36 (10-57)
Comorbidities, n (%)	
Hypertension	19 (26.0)
Congestive heart failure/Chronic ischemic heart disease	11 (15.0)
Diabetes Mellitus (DM)	6(8.0)
LTOT, n (%)	23 (32.0)
NIV, n (%)	10 (14.0)
BMI (kg/m^2)*	26±5.8
FFMI (kg/m^2)	18.8± 4
mMRC	2±2
FEV$_1$ %	43±18

* mean±sd

RESULTS

A total of 73 patients, 58 (80) men and 15 (20) women, with mean age 61±10 were evaluated. There were 55 (75%) COPD patients and 18 non-COPD patients (8 bronchiectasis, 5 interstitial lung disease and 5 kyphoscoliosis). The most common co-morbidities were hypertension 26%, congestive heart failure/ chronic ischaemic heart disease 15% and diabetes mellitus (DM) 8%. Among the patients, 23 (32%) were receiving LTOT and 10 (10%) were using non-invasive ventilation (NIV) at home. Table 1 shows the patients' demographics.

There were 42 (58%) patients in the younger patient group and 31 (42%) patients in the elderly group. The distribution of the COPD and non-COPD patients' co-morbidities, gender, BMI, LTOT, MMRC, SGRQ and HADS score among the young and elderly patients were similar (p>0.05). Table 2 shows the distribution of young and elderly patients.

Table 2. The distribution of patients as young and elderly completed PR.

Characteristics	Age <65 years N=42	Age ≥ 65 years N=31	p
Age, mean±sd	55±8	69±4	
Gender, n (%)			
Male	31 (72)	27(90)	0.06
Chronic pulmonary disease, n (%)			
COPD	30 (70)	25 (83)	0.18
Comorbidities, n (%)			
Hypertension	10(23,8)	9(29)	0.61
Congestive heart failure/Chronic ischemic heart disease	6(14)	5(16)	0.83
Diabetes Mellitus (DM)	3(7)	3(10)	0.69
BMI (kg/m^2), mean±sd	25±7	26±5	0.66
FFMI(kg/m^2), mean±sd	18.3±5	19.7±2	0.16
LTOT , n (%)	14(33)	9(29)	0.70
NIV, n(%)	9(21)	1(3)	**0.025**
CAT*	20±8	19±8	0.83
mMRC, mean±sd	2±1	2±1	0.38
SGRQ score, mean±sd			
Symptom	65±18	58±24	0.15
Activity	71±21	63±21	0.10
Impact	52±22	43±25	0.12
Total	60±18	52±22	0.08
HADS, mean ±sd			
Anxiety	9±5	6±4	0.06
Depresssion	8±5	9±4	0.64

* CAT was applied to COPD patients

Table 3 defines the changes in exercise capacity and QoL in young and elderly patients before and after PR. ISWT was performed in 62 patients. In both age groups, gains in exercise capacity measured by ISWT after PR was statistically significant (p=0.001). In 11 patients (7 young patients and 4 elderly patients) whose exercise capacity was low and the burden of the disease was high, the 6MWT test was performed. In younger patients, improvement in 6MWT after PR was significantly higher than that in the elderly group (p=0.028 vs. p=0.11), whereas in the elderly patients, minimal clinically important difference (MCID) (30m) was established. SGRQ revealed significantly higher improvement after PR in both age groups (p<0.05) .

Table 3. The changes of exercise capacity and quality of life in young and elderly patients before and after PR.

Characteristics	Age < 65 years N=42			Age ≥ 65 years N=31		
	Before PR	After PR	p	Before PR	After PR	p
ISWT(m),IQR*	320(220-430)	405(300-500)	0.001	330(260-400)	390(330-470)	**0.001**
6MWT(m),IQR**	200(160-280)	310(260-400)	0.028	224(159-338)	309(235-422)	0.11
CAT, mean ±sd ***	20±9	13±7	0.001	19±8	12±8	**0.003**
mMRC, mean ± sd	2.3±0.8	1.7±0.9	0.001	2±0.8	1.6±0.7	**0.001**
SGRQ , mean ± sd						
Symptom	64±19	56±17	0.008	58±24	48±21	**0.016**
Activity	72±21	60±21	0.001	63±22	51±24	**0.006**
Impact	52±23	37±23	0.001	43±27	32±22	**0.001**
Total	60±19	50±19	0.001	52±23	40±21	**0.001**
HADS, mean± sd						
Anxiety	9±5	7±4	0.014	7±4	5±4	0.07
Depression	8±5	7±4	0.26	8±4	6±4	**0.002**

* ISWT performed in 62 patients.**6MWT was performed in 11 patients,***CAT was performed in COPD patients

Table 4. The differences in walking capacity and quality of life measures of young and elderly patients before and after PR.

Characteristics	Age <65 years N=42	Age ≥ 65 years N=31	p
Δ ISWT* (m), median (IQR)	60(30-120)	80(50-110)	0.62
Δ 6MWT**(m), median (IQR)	65(30-190)	56(11-148)	0.57
Δ SGRQ total score, median (IQR)	-12.2(6-22)	-11(5-19)	0.51

*ISWT performed in 62 patients,**6MWT was performed in 11 patients, Δ:Representing the changes before and after PR

Table 4 summarises the rehabilitation responses of young and elderly patients. In younger patients, median 60 (30–120) m and 80 (50–110) m increase in the elderly group was recorded in ISWT after PR. In the SGRQ total score, a median 12.2 (6–22)-point decline in the younger group and 11 (5–19)-point decline in the elderly group were recorded. In terms of gains of ISWT, 6MWT and SGRQ ($p>0.05$), no significant difference was observed in both age groups.



DISCUSSION

In the present study, we demonstrated that there is no difference in the benefits of PR in the exercise capacity and the QoL between patients under 65 years and older with chronic respiratory diseases.

The incidence of chronic diseases increases with age. The number of drugs used due to illnesses increases and, in case of necessity, the use of additional medical devices is required. The world population is rapidly ageing and COPD is supposed to be the third leading cause of death worldwide by 2030 (16). The GOLD guidelines have accepted PR as a comprehensive non-pharmacological treatment aside from medical therapy (6). The age limit for being elderly is commonly accepted as 65 years, but this definition may also vary across countries depending on a wide range of socio-economic factors.

Mainly, in COPD and other chronic respiratory diseases, restriction in gas exchange, cardiac restriction, ventilatory limitation, as well as lower extremity and respiratory muscle dysfunctions result in shortness of breath and movement restrictions that are more prominent in elderly patients (1,17). O_2 and NIV support, when necessary, cause the patient to reduce their movement and stay at home more often. Past studies have shown that PR has positive effects on elderly COPD patients (18,19). In the current study, COPD patients as well as those with chronic pulmonary diseases other than COPD were involved. In our results, minimal clinically significant values were reached both in elderly COPD and non-COPD patients. These findings suggest that PR is appropriate not only for COPD but also for other chronic lung diseases. It is especially important that patients with early-stage interstitial lung disease are recommended to undergo PR (20).

The patients' frailty and respiratory impairment are important factors that trigger each other. Over time, patients become increasingly inactive and their loose muscle strength results in sarcopenia and frailty. Jones reported that 25.6% of the stable COPD patients are frail; however their frailty improved after PR (21,22). Considering this matter and taking the necessary precautions can indeed help patients with chronic lung disease in the future. In the present study, we did not evaluate the frailty of the elderly group and the improvement of their frail states after PR. However, considering frailty may be useful in future studies.

Another finding of the current study is that PR increases the exercise capacities of young and elderly patients. We performed the 6MWT in elderly patients who were unable to adapt to ISWT with reduced effort capacity. After 6MWT, the increase in exercise distance after PR was not statistically significant, although patients reached MCID values. An increase of 47.5 m in ISWT, 30 m in the 6MWT, a score of 4 in SGRQ, a 1.5 score in HADS and a score of 2 in CAT are all clinically important (12,23). Results indicated that such improvements can be achieved by both young and elderly patients.

In the present study, a significant statistical improvement in depression scores was observed after PR in patients over 65 years of age ($p=0.002$). However, there was no significant change in depression scores after PR in patients under 65 years ($p=0.26$). Meanwhile, there was a significant change in the anxiety score in younger patients ($p=0.014$) after PR. Both depression and anxiety cannot be fully realised by the patients. In the evaluation of this result, we think that the socio-cultural features can lead to differences in how patients express the constraint they are experiencing. Inability to perform personal affairs due to dyspnoea, social isolation, need for care and frequent hospital appointments often result in depression and anxiety.

This situation is also observed in the patients' caregivers over time. Depression is frequently reported in patients with chronic lung diseases (24,25). This group of patients should be observed in terms of depression and anxiety in the outpatient clinic, and the necessary patients should be

recommended to undergo psychological support. Significant improvements in the QoL assessments in both age groups indicate that they reach the goal of PR. Our goal in implementing PR is to ensure that patients are liberated as individuals and that they become more active.

In the PR programme, we also encouraged the patients to practice at home by following a written home exercise programme, which included exercise figures, apart from an 8-week (2days/week) outpatient PR programme. Educational sessions for inhaler medication techniques as well as O_2 usage for patients and their caregivers also positively affected compliance.

Aside from the exercise programme, undergoing PR also provides a social network for patients and a relief from social isolation; helps keep alliances with families and relatives; increases awareness about their disease, thus increasing the strength of the relationship between the patient and the physician; and increases their ability to control the disease and reduce the number of hospital appointments. Future studies may be able to demonstrate how gains achieved in PR among elderly patients can continue compared with those gained by younger patients.

The current study also has limitations. As this is a retrospective study, there may be some missing data. The study was carried out in a single centre, and limited generalisation of the data may be considered. Nevertheless, the strength of this study lies in its demonstration of the importance of PR in increasing disease awareness and in the fact that we also included chronic respiratory diseases other than COPD.

In conclusion, PR provides significant improvement for patients with chronic pulmonary diseases under 65 years and older and suffer from decreased exercise capacity and dyspnoea perception. PR in elderly patients, as an addition to medical treatment, is beneficial as it is for younger patients with chronic pulmonary diseases.

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RESEARCH

EFFECT OF TAI CHI CHUAN ON FEAR OF FALLING, BALANCE AND PHYSICAL SELF-PERCEPTION IN ELDERLY: A RANDOMISED CONTROLLED TRIAL

Abstract

Introduction: This study was aimed to examine the effects of Tai Chi Chuan on the fear of falling, balance, and physical self-perception in the elderly.

Materials and Method: This controlled trial using blocked randomization was stratified by sex, age, and history of falls and conducted with 44 elderly participants, of which 20 underwent Tai Chi Chuan training as experimental group and 24 served as an untrained control group. The experimental group underwent Tai Chi Chuan training for 12 weeks, twice a week, for 35-40 min/day under a research team member. The control group received no intervention. Data were collected from both groups by using a personal information form, the Modified Falls Efficacy Scale, the Physical Self-Perception Questionnaire, and the Tinetti Balance and Gait Assessment. After the exercise practice, each group was re-subjected to the same scales.

Results: Student's t-test and paired sample t-tests were used to analyze the data. The balance and physical self-perception of individuals in the Tai Chi Chuan group significantly improved compared with that in the control group ($p<0.001$). Additionally, individuals in the Tai Chi Chuan group demonstrated reduced fear of falling ($p<0.001$).

Conclusion: Tai Chi Chuan positively affects balance and physical self-perception, and reduced fear of falling in elderly individuals. As a result, the potential application of Tai Chi Chuan was suggested in various settings where elderly individuals inhabit.

Key Words: Aged; Accidental Falls; Tai Ji; Self Concept

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ARAŞTIRMA

YAŞLILARA UYGULANAN TAI CHI CHUAN EGZERSİZİNİN DÜŞME KORKUSU, DENGE VE FİZİKSEL BENLİK ALGISI ÜZERİNE ETKİSİ: RANDOMİZE KONTROLLÜ ÇALIŞMA

Öz

Giriş: Bu çalışma Tai Chi Chuan egzersizinin yaşlılarda düşme korkusu, denge ve fiziksel benlik algısı üzerine etkisini belirlemek amacıyla yapılmıştır.

Gereç ve Yöntem: Çalışma, cinsiyet, yaş ve düşme öyküsüne göre tabakalandırılmış randomize kontrollü bir çalışma olup, Tai Chi Chuan egzersizi uygulanan 20 deney grubu ve her hangi bir girişim uygulanmayan 24 kontrol grubu olmak üzere toplam 44 yaşlı bireyin katılımı ile gerçekleştirildi. Deney grubuna 12 hafta süre ile haftada iki kez, günde 35-40 dk. araştırmacı tarafından Tai Chi Chuan egzersizi yaptırıldı. Kontrol grubuna herhangi bir girişimde bulunulmadı. Araştırmada veriler her iki grupta, tanıtıcı özellikler bilgi formu, Modifiye Düşmeye Karşı Yetkinlik Ölçeği, Kendini Fiziksel Tanımlama Envanteri ve Tinetti Denge ve Yürüme Değerlendirmesi kullanılarak toplandı. Egzersiz uygulamasından sonra her iki gruba aynı ölçekler tekrar uygulandı.

Bulgular: Verilerin değerlendirilmesinde Student t-testi ve eşleştirilmiş örneklem t-testi kullanıldı. Tai Chi Chuan egzersizi uygulanan deney grubundaki bireylerin dengesinde ve fiziksel benlik algısında kontrol grubuna göre önemli derecede iyileşme oldu ($p<0.001$). Ayrıca Tai Chi Chuan grubundaki bireyler kontrol grubuna göre daha düşük düşme korkusu sergiledi, ($p<0.001$).

Sonuç: Tai Chi Chuan egzersizinin yaşlı bireylerde denge ve fiziksel benlik algısını olumlu etkilediği, düşme korkusunu azalttığı bulundu. Sonuç olarak, Bu egzersizin yaşlı bireylerin yaşadığı her ortamda yaptırılabileceği önerisinde bulunuldu.

Anahtar Sözcükler: Yaşlılık; Düşme; Tai Chi Chuan; Benlik algısı



INTRODUCTION

The aging world population is one of the most important social changes of the 21st century. The number of individuals classified as "older persons," as a percentage of the total population, is increasing in almost all countries. Turkey is among several countries in which rapid shifts toward increased age within the general population has been observed. In addition to living longer, older persons of society seek a life that is as independent as possible, where cognition and intellect are maintained throughout the life of an individual. Many desire an active life style, with a high quality of life and general satisfaction with living. Unfortunately, age-related biological, psychological, and physiological changes may exert negative effects on the quality of life. Increase in the incidence and prevalence of health problems among the older persons decrease self-sufficiency in this population. Health impairments may also contribute to increase in both the frequency and severity of falls, with current estimates of fall prevalence in elderly populations being 30%-50% (1).

Previous investigations have revealed high fall rates among the Turkish elderly population. One study found that 47.5% of men and 56% of women living in nursing homes had fallen within the preceding year (2). The physical effects of the falls are also psychological and social consequences. Fear of falling (FOF) is common in the elderly, with estimates being 20%-85%, and is intensified in those with a history of falls (3,4). Fall-related injuries cause further FOF, leading to additional falls, thus feeding the vicious circle. Previous studies have primarily focused on the frequency of falls, FOF, negative health outcomes associated with falling, and the development and evaluation of therapeutic strategies to prevent or treat fall-related injuries (1).

Fall risk and FOF can be mitigated through planned nursing interventions. One such intervention involves motivating the older persons to engage in physical activity through structured instruction and encouragement. Programs that involve aerobic exercise or that improve balance and flexibility can be effective while increasing self-confidence (5).

Tai Chi Chuan (TCC) is a suitable exercise for older adults because of its low impact and low velocity. Moreover, TCC is a low-technology approach to conditioning that can be implemented with low costs and during the past 20 years, TCC has spread throughout Western countries and is offered in many local community services (6). The integrated physical and cognitive components in TCC could represent the additional value of TCC compared with other exercise programs which mainly focus on physical aspects only. Besides a variety of health-related benefits for older people are attributed to TCC, including improved balance control, improved cardiorespiratory functions, enhanced psychosocial well-being and reduced risk of falling (7). In several systematic studies and a meta-analysis, it is stated that TCC reduces the risk of falling and increases muscle strength, endurance and flexibility which affects the balance positively (7-10).

Improved self-confidence and physical self-perception have also been observed following TCC (11). Here, the concept of "physical self-perception" refers to self-awareness at the psychomotor level. It is how an individual perceives or assesses his or her own motor skills, such as coordination, as well as global physical fitness parameters, such as flexibility (12). Because of its ability to address physical, emotional, and spiritual domains of function, TCC is increasingly accepted as an effective strategy for improving physical and mental health in older persons (13). The specific aim of this project was to examine the effects of TCC on the FOF, balance, and flexibility, coordination, and self-confidence in older persons.

Hypotheses of the research

H1: The falling risk in the TCC group is lower compared to the control group.

H2: The FOF in the TCC group is lower compared to the control group.

H3: The flexibility, coordination and self-confidence perceptions in the TCC group is higher compared to the control group.

MATERIALS AND METHOD

Study Design and Sample Selection

This research is a randomized control group pretest–posttest design. The study sample was drawn from a population of 220 older persons living in a nursing home in Ankara, Turkey. To achieve a power of 90% with a margin of error of 0.05, the target sample size was determined to be 40 individuals using power analysis and sample size software. Taking into account the likelihood of attrition and participants lost to follow-up, a total of 56 older persons were included in the study sample.

Individuals were excluded from participation if they were diagnosed with neurological disease, cardiovascular disease, dementia, or scored less than 24 points on the Mini Mental Status Examination. Those already engaged in a regular exercise program were also excluded.

A blocked randomization method was used to stratify participants with respect to age (65-74 years and ≥75 years), sex, and history of falling. All study procedures were conducted over a 4-month period between March and June of 2015.

Instruments

Tinetti Balance and Gait Assessment (TBGA)

This assessment was firstly created by Mary Tinetti in 1986 to make evaluations in the patients with high falling risk (14). The adjustment of the TGBA to the Turkish society was done by Ağırcan (2009) and the Cronbach alpha value was found as 0.97. Scoring is done on a three-point scale with a range on each item of 0-2 with 0 representing the most impairment. Individual scores are then combined to form three scales: Gait Scale, Balance Scale and then and overall Gait and Balance score. The maximum score for gait is 12 points while the maximum for balance is 16 points with a total maximum for the overall Tinetti Instrument of 28 points (15).

In this study, since the assessment of the change in balance performance via TCC exercise was aimed, only the balance assessment compound of the TBGA was used. The total score of the first 9 items gives the balance score and the higher the score, the better the performance.

The Modified Falls Efficacy Scale (MFES)

MFES comprising 14 items consists of the questions regarding some specific activities performed indoors and outdoors such as dressing up, bathing, crossing the street etc. (16). The MFES evaluates the sense of security about each activity performed without falling on a scale ranges between "0" (completely insecure) and "10" (completely secure). The total score is calculated by dividing the sum of the values of the answers for each question to the number of answered questions. It is assumed that higher total score is, higher sense of security and therefore the lower fear of falling (16).

A Turkish validity and reliability study of the MFES was conducted by Birimoğlu and Bilgili (2016). The Cronbach alpha value of the MFES was 0.97 and the internal stability of the scale items ranged between 0.73-0.99 (17).

Physical Self-Description Questionnaire (PSDQ)

The scale was created by Marsh (1996) (18), and the Turkish adjustment of the scale was done by Aşçı (2000) (19). This scale measuring physical self-perception includes a total of 11 sub-scales, 9 of which are physical-self-concept compounds (health, coordination, physical activity, body fat ratio, sports skills, appearance, strength, flexibility and durability) and 2 are general self-concept compounds (general physical competence and self-confidence), and the sub-scales can be used separately. The PSDQ consists of 70 items and a 6-point Likert-type scale which ranges between "completely false=1" and "completely true=6". Possible facet scores range from 70 to 420. The

internal consistency coefficient Cronbach alpha of the sub-scale of the PSDQ ranged between 0.87 and 0.98 (19). In our study, coordination, flexibility, and self-confidence sub-dimensions were used and the internal consistency coefficient Cronbach alpha of the sub-dimensions of the scale was stated as 0.88 for flexibility, 0.87 for coordination and 0.68 for self-confidence perceptions. Higher PSDQ score means higher coordination, flexibility and self-confidence perceptions.

Procedure

Experimental and Control Groups

Participants assigned to the experimental group completed a standardized 12-week program of TCC. The exercises were performed by the first researcher with TCC certification and also same researcher carried out all sessions. TCC sessions were conducted twice per week, using the Yang Style of TCC (20) (Figure 1).



Figure 1. Yang Style of TCC

Each session included 5 min of warm-up exercise, 30 min of TCC practice, and 5 min of cool-down exercise. Each form of TCC emphasized multidirectional weight shifting, awareness of body alignment, and multisegmental movement coordination (20).

An additional "make up" session was conducted once per week to accommodate participants who had to miss a regularly scheduled session. Six elderly individuals who could not regularly participate in the 12-week program were excluded from the experimental group and the study was completed with the remaining 20 subjects. Participants assigned to the control group did not receive any specialized intervention and participated only in usual care exercises over the study period. Six participants from the control group were also excluded from the study as they refused to perform the posttest and as they were absent for a long time; therefore, data of 24 participants were analyzed. After the completion of the program, post-tests (TBGA, MFES, and PSDQ) were reapplied to both groups by a nursing home physiotherapist.

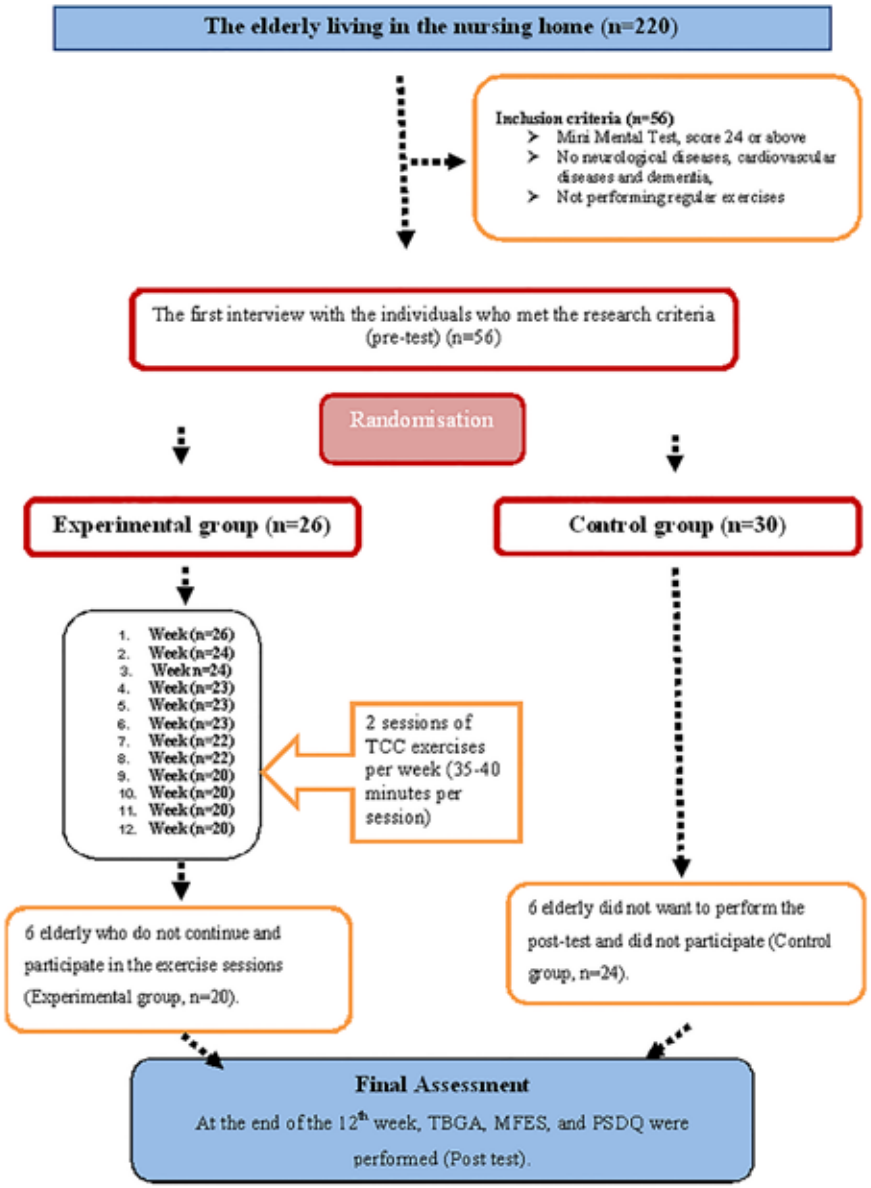


Figure 2. Schematic representation of the study plan

Data Analysis

Statistical Package for Social Sciences (SPSS) 20.0 software was used for statistical analyses. Our data showed normal distribution and besides descriptive statistics, independent samples t-test was performed to analyze the differences between the experimental and control groups in the FOF, balance and physical self-perception scores. In addition, paired samples t-test was conducted to determine differences among the pre and post test scores of the experimental group.

Ethical Considerations

The study has been approved by the Institutional Ethnics Committee of the university (no:25901500-201) and the Ministry of Family and Social Policies (no:73595336-605.01-7552). The study was conducted in accordance with the principles of the Declaration of Helsinki. Participation in this study was voluntary.

RESULTS

23 men (mean age 72.56, sd=5.8) and 21 women (mean age 78.85, sd=6.8) completed the study. Six participants assigned to the experimental group were unable to complete the 12-week TCC program and were therefore excluded from the final analysis.

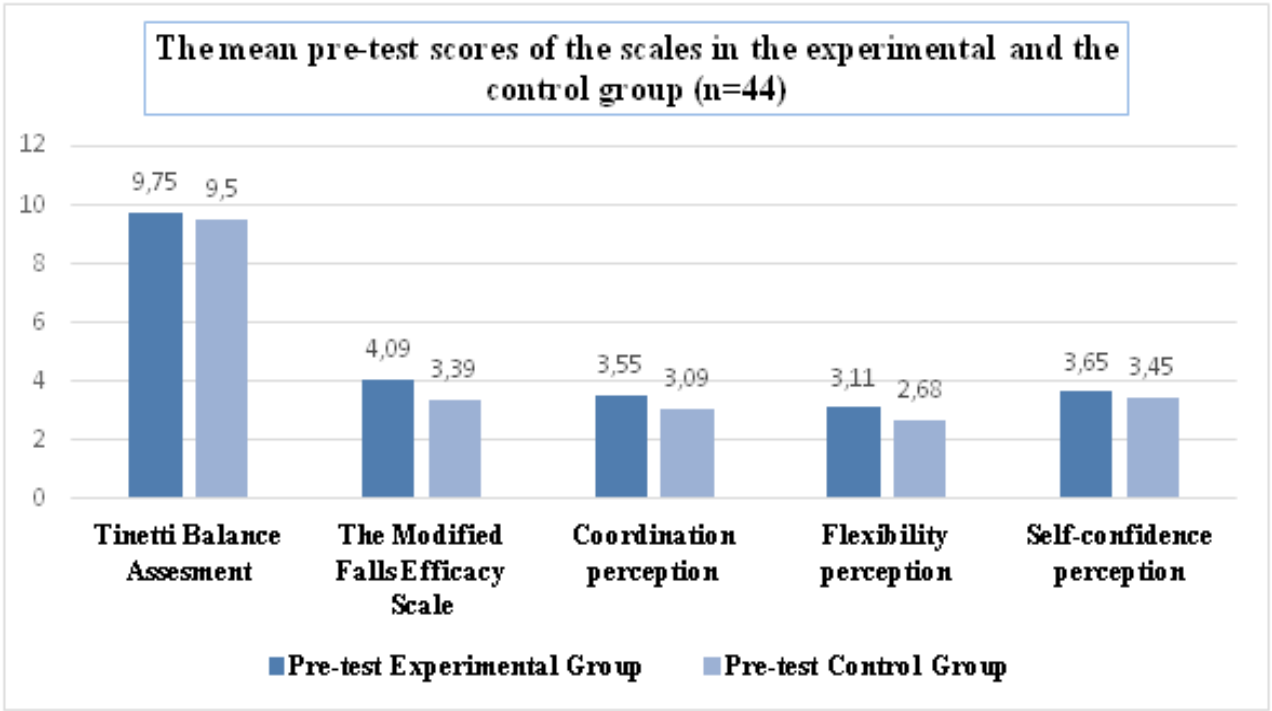


Figure 3. The mean pre-test scores of the scales in the experimental and the control group.

It was found that the Tinnetti balance scale scores of the older persons in the experimental group increased, and there was a significant difference between their pre and post-test scores ($p<0.01$).

Similarly, it was found that the MFES scores of the older persons in the experimental group also increased, and there was a significant difference between their pre and post-test scores ($p<0.01$).

In addition, there was a significant difference in the sub-dimensions of the PSDQ scores that are the coordination, flexibility, and self-confidence perceptions before and after TCC in the experimental group, and the post-test scores increased ($p<0.01$).

Table 1. The mean pre-and post-test scores of the scales in the experimental group.

Scales	Pre-Test mean±SE		Post-Test mean±SE		t test, p value	
Tinetti Balance Assesment	9.75	1.88	12.9	1.83	9.64	**0.000**
MFES	4.09	1.56	6.54	2.03	9.46	**0.000**
PSDQ						
Coordination perception	3.55	0.83	4.65	0.72	6.31	**0.000**
Flexibility perception	3.11	1.07	4.07	1.02	5.17	**0.000**
Self-confidence perception	3,65	0,52	4,25	0,39	4,76	**0,000**

Table 2. The mean pre-and post-test scores of the scales in the control group.

Scales	Pre-Test mean±SE		Post-Test mean±SE		t test, p value	
Tinetti Balance Assesment	9.50	1.50	9.33	1.73	1.163	0.257
MFES	3.39	1.21	3.38	1.07	0.102	0.920
PSDQ						
Coordination perception	3.09	0.64	3.15	0.55	-1.476	0.153
Flexibility perception	2.68	0.60	2.76	0.43	-1.252	0.223
Self-confidence perception	3.45	0.36	3.45	0.36	0.000	1.000

It can be noticed that there is no significant difference between the pre and post-test scores of the Tinetti balance scale in the control group ($p>0.05$). Likewise, no significant difference was found between the pre and post-test scores of the older persons in the control group regarding the MFES and the sub-dimensions of the coordination, flexibility, and self-confidence perceptions of the PSDQ ($p>0.05$).

Table 3. The mean post-test scores of the scales in the experimental and the control group.

Scales	Experimental Group mean±SE		Control Group mean±SE		t test, p value	
Tinetti Balance Assesment	12.90	1.83	9.33	1.73	-6.584	**0.000**
MFES	6.54	2.03	3.38	1.07	5.607	**0.000**
PSDQ						
Coordination perception	4.65	0.72	3.15	0.55	7.562	**0.000**
Flexibility perception	4.07	1.02	2.76	0.43	5.354	**0.000**
Self-confidence perception	4.25	0.39	3.45	0.36	6.941	**0.000**



When the post-test scores of Tinetti balance scale, MFES and the sub-dimensions of the coordination, flexibility, and self-confidence perceptions of the PSDQ in the experimental and the control groups were viewed; it can be seen that the scores in the experimental group is higher and the difference between two groups is statistically significant ($p<0.01$).

DISCUSSION

Balance problems in the older persons exert considerable effects on fall risk and may adversely impact daily activities and social relationships (8). Targeted exercise programs such as TCC can improve balance and produce positive effects on the quality of life (9). Tousignant et al. reported that in a cohort of 152 older persons who underwent TCC, factors relating to fall risk decreased, ultimately resulting in fewer total falls (21). Another study, conducted by Konig et al. (2014), found that a 12-week TCC exercise program improved balance in older persons (22). A further review of 24 studies suggested that TCC produced beneficial effects on aging-related deficits in posture and balance, decreased fall risk, improved the performance of daily living activities, and increased the perception of overall health (8). Furthermore, it was found in the current study that TCC had a positive effect on balance, and thus, it reduced the risk of falling.

In this study, completion of the TCC program was associated with reductions in the FOF. Targeted exercise programs, such as TCC, improve muscle strength and balance, thereby reducing the FOF and increasing perceived self-confidence (21,23). These findings are in agreement with those of Loggbe et al., who concluded that TCC had a significant and positive effect on the FOF (7). Our findings are also in agreement with those of another Japanese study, where the experimental group demonstrated reduced FOF following an 8-week TCC program (5). In this study, the FOF was assessed via the MFES. Average MFES scores significantly increased for participants in the experimental group ($p<0.01$, Table 1), a finding that was not observed in control group participants.

In addition to its physical benefits, TCC may exert positive effects on physical self-perception (24). Physical self-perception is a core component of self-confidence and general self-perception. Defined as the self-perception and assessment of the individual at psychomotor level, physical self-perception appears to change following exposure to exercise programs (12). The effects of TCC on physical self-perception were assessed through the administration of the PSDQ. Participants who completed TCC demonstrated significant improvements in PSDQ sub-scales of perceived coordination, flexibility, and self-confidence (Table 3). These findings are in line with those of Aşçı that physical activity increases physical skills and physical compatibility level, resulting in a positive change on individual self-perception (12). Because of beneficial effects on the motor coordination, balance, body consciousness, and the overall function of muscles, tendons and joints, especially by increasing the articular function of sub-extremities and body consciousness, TCC may enhance individual perception of safety while performing wide-ranging activities such as walking, lying down, getting up, and running (12). In the present study, significant improvements in PSDQ sub-scale scores of perceived self-confidence, coordination, and flexibility are consistent with other results reported within the literature (5,13).

TCC is a suitable exercise for older adults because of its low impact and low velocity. Moreover, TCC is a low-technology approach to conditioning that can be implemented with low costs and during the past 20 years, TCC has spread throughout Western countries and is offered in many local community services (6). The integrated physical and cognitive components in TCC could

represent the additional value of TCC compared with other exercise programs which mainly focus on physical aspects only (7). Besides a variety of health-related benefits for older people are attributed to TCC, including improved balance control, improved cardiorespiratory functions, enhanced psychosocial well-being and reduced risk of falling (7-10).

In conclusion, TCC have provided positive evidence that TCC practitioners have better balance, muscle strength and improved proprioception than those without TCC practice (6,9,13,22,24). This evidence leads to the suggestion that TCC might be beneficial to patients with FOF, balance and physical self-perception who have poor muscle strength and balance control associated with a higher risk of falling and FOF.

Based on the results of this study, a standardized 12-week TCC program improved balance and increased perceived flexibility, coordination, and self-confidence. Accordingly, it was revealed that TCC exercise decreased the FOF and fall risk in the elderly and all hypotheses were approved.

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RESEARCH

INTIMATE PARTNER VIOLENCE IN THE ELDERLY WOMEN, RISK FACTORS, COPING STRATEGIES AND HEALTH CONSEQUENCES: A QUALITATIVE STUDY

Abstract

Introduction: Intimate partner violence is a global public health problem that causes physical, sexual and psychological harm to elderly women.

Materials and Method: The present qualitative study was conducted on 8 elderly women living at a nursing home, who were the victims of IPV in the past. The aim of the current study was to reveal the health consequences of their experiences of intimate partner violence, its risk factors and their coping strategies. Focus group interview method was used in our study. Qualitative content analysis method was employed as a data analysis method.

Results: In the focus group interviews, it was observed that elder women were mostly exposed to physical, verbal, emotional violence and that they generally decided to remain silent against the violence, showed patience, took refuge in God, and they were affected psychologically in the long term. Marriage at a young age, economic status, gender roles, and traditional structure, religious believes and values appear as significant risk factors for intimate partner violence in elderly women.

Conclusion: The results of the present study suggest that elderly women have been considerably affected by domestic violence. However, these women did not react to violence due to traditional social structure and tried to cope with it through religion. It is suggested that nurses should evaluate elderly women at nursing home in terms of intimate partner violence.

Key Words: Aged; Domestic violence; Risk factors.

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ARAŞTIRMA

YAŞLI KADINLARIN AİLE İÇİ ŞİDDET DENEYİMLERİ, RİSK FAKTÖRLERİ, BAŞ ETME YAKLAŞIMLARI VE SAĞLIK SONUÇLARI: NİTEL ÇALIŞMA

Öz

Giriş: Aile içi şiddet, yaşlı kadınlar için fiziksel, cinsel ve psikolojik zararlara neden olan, küresel bir halk sağlığı sorunudur.

Gereç ve Yöntem: Niteliksel çalışma, yaşlı kadınların aile içi yaşadıkları şiddet deneyimleri, risk faktörleri, baş etme yaklaşımları, ve aile içi şiddetin sağlık sonuçlarını ortaya koyabilmek amacıyla, huzurevinde yaşayan geçmişte aile içi şiddet mağduru 8 yaşlı kadın ile yapılmıştır. Çalışmada ses kaydı yapılarak odak grup görüşme yöntemi kullanılmıştır. Veri analizinde kalitatif içerik analizi yöntemi kullanılmıştır.

Bulgular: Yapılan odak grup görüşmelerinde, yaşlı kadınların şiddet olarak daha çok fiziksel, sözel, duygusal şiddete maruz kaldıkları, şiddet karşında genellikle sessiz kalmayı tercih ettikleri, sabrettikleri, Allaha sığındıkları ve şiddetten uzun vadede psikolojik olarak etkilendikleri görüldü. Yaşlı kadınların aile içi şiddeti yaşama nedenleri ve risk faktörleri arasında küçük yaşta evlenme, ekonomik durum, cinsiyet rolleri, geleneksel yapı, dini inançlar ve değerler belirgin olarak ortaya çıkmaktadır.

Sonuç: Yaşlı kadınların aile içi şiddetten önemli derecede etkilendiği, geleneksel yapı nedeniyle şiddete tepki vermedikleri ve şiddet ile inançları yoluyla başettikleri görülmektedir. Hemşirelerin, huzurevinde yaşlı kadınları şiddete uğrama yönünden değerlendirmesi önerilir.

Anahtar Sözcükler: Yaşlı; Aile içi şiddet; Risk faktörleri



INTRODUCTION

Although intimate partner violence (IPV) affects women in all age groups, most studies in the literature have addressed women in the middle age group. Elderly women who were the victims of domestic violence and their specific problems are neglected (1). However, it is obvious that IPV also occurs in the elderly or negative effects of previous experiences of IPV persist in elderly women, IPV will increasingly become a significant problem with increasing population (2). Indeed, a study that evaluated the prevalence of IPV in women over the age of 50 years presenting to primary health care units abroad suggested that 2.14% of women were exposed to sexual violence and 2.63% of women were exposed to physical violence (3). Mouton et al. (4) reported in their study that 2% of women between 50 and 79 years of age experienced physical violence and 10% experienced verbal violence in the last one year. A study of intimate partner violence conducted across Turkey suggested that 36% of married women between 15-59 years of age experienced physical violence, 12% experienced sexual violence, 44% experienced emotional violence, and 30% experienced economic abuse; however, their study reports no data on the elderly women (5).

IPV affects both females and males, and approximately one third of females experience IPV throughout their lives (6). Gender appears to be an important factor for being exposed to violence. Patriarchal family structure, sociocultural and religious values, presence of political systems acknowledging the violation of women's rights (7), young age and advanced age, low educational status of the women, insufficient economic status, domestic violence in the family of the spouse (8), and young age at first marriage (9) are considered risk factors.

IPV has many health consequences in the short-term as well as in the long-term (6,10-12). As a result, nurses working in primary and secondary care settings are likely to encounter elderly women who were typically exposed to IPV. Nurses are at a key position in terms of diagnosing, evaluating IPV and providing counseling and referral services to patients in all age groups and in all domains (13). There is also a need for quantitative and qualitative studies on IPV in elderly women in Turkey. For this reason, the aim of this study was to determine the life experiences of IPV among elderly women, its risk factors, coping strategies and health consequences.

MATERIALS AND METHOD

The present study was designed as a qualitative research in order to reveal past IPV experiences of elderly women, its risk factors, coping strategies and health results.

The universe of the study was composed of 33 elderly women living in a nursing home affiliated to the Ministry of Family and Social Policies in Kırşehir, a city of middle Anatolian region of Turkey. For focus group interviews, 8 elderly women were selected who were considered to have sufficient cognitive capacity based on the evaluations by the healthcare personnel of the nursing home and who had a history of exposure to IPV before coming to nursing home and who consented to participate in the study. A semi-structured interview guide consisting of open-ended questions prepared according to the literature was used for data collection. Focus group interview questions were organized into 4 themes as listed below.

1. Older women's experiences of IPV, (type of the violence, frequency, magnitude

2. Causes of IPV/ Risk Factors

3. Coping strategies of elderly women

4. Health consequences of IPV (physiological, psychological, social, moral, developmental)

During the interview, the researcher acted as a moderator and directed the interview questions to elderly women, while one collaborator recorded the interview uninterruptedly and the other took noted regarding the responses. Focus group

interview was carried out for single session lasting for 2.5 hours. A 15-minutes were allocated to each participants in order them to express themselves adequately and all questions were systematically asked within this period. The arrangement of the interview environment was carried out by the researcher before the session so that interviews could be carried out comfortably. Qualitative content analysis method was employed as a data analysis method. The code list was composed by researchers by using their independent content analysis. Then, independent codes were compared and an agreement on the different codes was done. Finally, all codes were categorized and the themes were formed.

Necessary permissions for the present study were obtained from the Ethics Committee of Ahi Evran University (2017-01/06). All participants were informed of the study, and verbal and written consents were obtained. In order to record participants' voices, verbal consents were also obtained before the focus group interviews.

RESULTS

All participants were widowed and had an age range of 68-80 years, and age at first marriage was in the range of 14-17 years. Of these elderly women, 5 were elementary school graduate (2 years), 2 were uneducated (UE), and 1 was literate (L). All elderly women were housewives. Two women did not have an income, and among those with regular income, the lowest pension was 150 Turkish Liras (TL) and the highest pension was 1300 TL. All participants had at least one chronic illness.

Experience of violence in the elderly women

It was observed that the elderly women described having experienced physical, verbal, emotional, and social violence but not economic abuse and sexual violence.

Participants reported their experiences of physical violence as follows: "*He used to come inside the room and beat me"* (Interviewee 1). "*He used to beat me so many times, I wish the God makes him suffer, too (laughter)* (Interviewee *2*)"," *He used to beat me when he took alcohol. He used to come and tormented me. If the food was not ready, he used to beat me for this excuse.* "(Interviewee 3).

An old woman who experienced verbal and emotional violence expressed her experience by saying, *" If I did not prepare the food, he used to be very rude and used to shout at me"* (Interviewee 4).

With respect to social violence, we observe that elderly women's behaviors were restricted and communication with the environment was prevented. Elderly women expressed their experienced as follows: "*I was not allowed to go out, also, nobody came to my home because they were afraid"* (Interviewee 6), "*Before, he did not allow me to go out, but later he started to allow me from time to time"* (Interviewee 7).

It was observed that some elderly women experienced a combination of physical, emotional and verbal violence. Elderly women expressed this violence as follows*: "I was always beaten by my husband, I heard bad words, he reviled me, all men are course-mouthed, is anyone better "* (Interviewee 5).

Reasons of violence/ Risk Factors

Various risk factors have been identified to cause violence and facilitate exposure to intimate partner violence, or prevent elderly women to overcome it. Marriage at very young age appears as one of the most important risk factors in these women. One of the elderly women expressed this as follows. *"I married at the age of 14, I was very young and I was not aware of anything"* (Interviewee 7).

It is remarkable that while women were exposed to violence, they also justified the causes of violence to internalize gender roles of the society. Some of the older women expressed this as follows: *"He used to beat when I did not sleep with him. He used to call me, and I would not go. So what, it was normal in this situation that he slaps me and goes away"* (She showed a bunch of fives) (Interviewee 1).



Elderly women were exposed to violence for reasons such as not preparing food, not selling herself with her efforts. Elderly women expressed this as follows: "He was mad at me for some reason or another, *he used to beat me for any reason as you understand"* (Interviewee 7)," *For example, if I did not take something to somewhere this could be a reason to fight in his point of view. He used to behave badly, when I did not prepare food. "*(Interviewee 4).

Another risk factor of intimate partner violence is that wife is responsible for children and housework. *" I stayed for my children. They were the ones who stopped me "*(Interviewee 8).

Beliefs about marriage, family structure, traditions, are also considered important risk factors for intimate partner violence. Some participants expressed this as follows: *"He is in the end was a stranger. He either beat me or loved me… All in the end are stranger (Interviewee 1) "At first, I did not want to bend my father's head down, so I did not go back home. Then, my father passed away and I could never go back home" "* (Interviewee 7).

One of these elderly women associated her beliefs on marriage with religious thoughts. *"Our ancestors used to say that the divorce is a sin, God does not like it", she said* (Interviewee 5). This mentality prevented these elderly women from reacting to intimate partner violence and caused these women to bear violence.

The final risk factor for IPV is the lack of economic independence and family support services of elderly women. At the same time, it is seen that older women justify the causes of violence, show respect to their partner who use violence, and this leads to decreased self-worthiness. Participants expressed these as follows, *"I was beaten but still he kept me under his roof anyway. What I ate and wore all belongs to him."*(Interviewee 1).

Coping Strategies of Elderly Women

It was observed that elderly women preferred doing nothing against the violence not sharing their experiences with others. The elderly women expressed this as follows*: When he shouts and I understand he is getting angry, I go out of the door, and then he calms down. I go to buy odds and ends, and I cook the meal, he just lies there. I do all the work not to make him mad. "*(Interviewee 6) *"I used to sit and cry, I wish God don't give this faith to anyone" (Interviewee 2)," We would not tell anyone for not to be ashamed in the eyes of other people"* (Interviewee 8).

Some of the elderly women expressed their patience in coping with IPV, dependence of religion, their religious practices and how they prefer to seek refuge in God as follows. *"I used to sit and pray, I used to pray the rosary and glorify God"* (Interviewee 5). "I called God on my own. I used to say " Please God, give me a death so that I don't see all these." "(Interviewee 3).

Health consequences of IPV

It is considered that IPV in elderly women is associated with health problems. Both physiological and psychological health domains of the elderly women are affected in the short-term and long-term.

One of these elderly women expressed the health consequence of violence as follows, *"He used to beat me up. They took me to the hospital almost dead, all over my body was bruised."* It is seen that older women are affected deeply and psychologically from IPV and importantly even though many years have passed since then, the negative effects of violence persist. The elderly women express their experiences as follows, *"His words made me suffer, but nothing to do other than stand all these. Before I sleep, I was always thinking, obsessed with this issue. I was crying and crying. How I was beaten, tortured by him was coming in my mind but nothing to do"* (Interviewee 2). ,*"Look my daughter, (she is referring to the researcher) my hands are shaking when I remember. I could not stand against it and what I have become..."*(Interviewee 6), expressions such as*" Look what happened at the end, I went blind because of crying that much "*(Interviewee 7).

DISCUSSION

Qualitative data of the study revealed that even though elderly women express their experiences of physical, verbal, and emotional violence, but they do not express their experiences of economic and sexual violence. The present study was also conducted in the city of Kırşehir, which is located in Central Anatolia, and most women in focus group interviews expressed that they experienced IPV. The studies conducted to investigate IPV in middle-aged women in different cities of Turkey and international studies on IPV in elderly women reveal physical and emotional violence in many cases (9, 14-16). Thus, physical and emotional violence appears as the most common and easily identified type of violence in the family. The reason for not expressing sexual violence could be that women in Turkey perceive the sexuality as a task to fulfill for their husbands, they lack information about the subject or the fact that they think such situations are so intimate that they can live only in the family and they cannot share. At this point, it is important to emphasize that cultural values of the society and individuals shape attitudes towards IPV. Also, when these women think about violence, they think in terms of physical violence, and they may not recognize other types of violence to which they are exposed.

In focus group interviews, we see that elderly women are affected by various factors when we examine the causes and risk factors for domestic violence. We may consider these factors as marriage at a young age, economic status, gender roles, traditional structure, religious beliefs and values. It is also seen that elderly women have more traditional attitudes towards gender roles, marriage and familial values (17).

Particularly in developing societies as Turkey in which patriarchal family structure exhibits its characteristic features in the full extent, community is casting women in the roles of remaining silent on the encountered problems in all areas, facing up to everything in married life, and resignation, while the same community is casting men in the roles of acting tough, arguing, and resorting physical and psychological violence when needed (18). It may be suggested that women are more exposed to violence in societies in which male dominance has been acknowledged and gender roles are separated by sharp lines.

Younger age at marriage is associated with more exposure to domestic violence (9, 19). In the present research, age at first marriage was in the range of 14-17 years and young age at marriage is suggested to be the cause of not fighting back to violence. It is suggested that marriage at a young age is the cause of more exposure to violence due to lack of consciousness at young ages. In addition, age gap between couples might be contributing to this outcome. At older ages, women think that they become more dependent to their husbands and this way of thinking is considered as the reason of difficulty in resisting and developing an attitude towards violence.

Similarly, it was found that women in low economic status were more exposed to violence (13). In the present study, it was also determined that two older women did not have any monthly income, and the lowest income was 150 TL and the highest was 1300 TL. As has been understood from the expressions of elderly women, it is suggested that low economic status is an important factor in tolerating the violence.

Faith is an important factor in our personal and social lives and it has an important role in establishing the balance between individual's inner world and social life (20). Erdogan et al. (21) interviewed 15 women experiencing IPV and they found that most women with a perpetrator husband and limited supportive resources held on to religious values and faith and resorted to their internal resources, which they could access more easily. During focus group interviews, it is observed that the older women were very patient during their experience of IPV, and they especially prefer to



hold on to their religious beliefs and they did their religious practices and seek refuge in God. As it is known, the religion, especially in Muslim societies, is an important emotional supporter that women experiencing IPV resort in situations that they are not feeling safe (21).

In focus group interviews, older women stated that they generally decided to remain silent when they were exposed to IPV. A previous study also found that 33% of victimized women resigned themselves to the perpetrator did not fight back to violence (9). Erdogan et al. (21) conducted a study with in-depth interviews with 15 women living in women's shelters in their research. It was often observed that these women often adopted problem-focused methods against the violence such as confrontation, distancing, and receiving family support, and emotion-focused methods such as patience, submissiveness /fatalism and religion. Browne (22) suggested, in response to ideas that women continuing to live with the perpetrator partner chose to remain silent, that many women in this situation chose this because of the inadequate precautions that could save them.

Intimate partner violence (IPV) is a global public health concern and an issue of human rights with physical, sexual, and psychological harm to women (6). Victimized women may experience stress-related disorders such as post-traumatic stress disorder, sexual dysfunction, sleep and eating disorders, and panic attack, along with other problems such as anxiety, depression, suicide, self-accusation, decreased self-esteem, humiliation, fears, injuries, and chronic diseases (6, 10, 11). Focus group interviews revealed that women were psychologically more affected by the violence and were not able to recover from the long-term effects of violence. The elderly women in the present study had at least one chronic disease and one woman also had anxiety disorder. It appears that identification and prevention of domestic violence is crucial to improve women's health.

In conclusion, focus group interviews showed that elderly women were more exposed to physical, verbal, emotional violence as a means of IPV, and they generally chose to remain silent against the violence, showed patience, took refuge in God, and they were effected psychologically in the long term. The results of the present study suggest that further quantitative and qualitative studies should be conducted to reveal perception of elderly women, who are the victims of domestic violence in an attempt to draw attention to domestic violence in the elderly women. Therefore, it is suggested that nurses should evaluate elderly women at nursing home in terms of IPV, put some effort and spend time with them in order to understand those women.

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CASE REPORT

CHRONIC RECALCITRANT DERMATOSIS: EROSIVE PUSTULAR DERMATOSIS OF THE SCALP TREATED WITH ACITRETIN AND TOPICAL TACROLIMUS

Abstract

Erosive pustular dermatosis of the scalp is an uncommon disorder of the scalp, which causes chronic sterile pustules and non-healing erosions, leading to cicatricial alopecia and skin cancer. The disease usually affects older individuals. The exact pathogenesis of erosive pustular dermatosis of the scalp is unknown but microscopic examination reveals inflammation with neutrophils. As a result of limited efficacy of various medical and surgical modalities, erosive pustular dermatosis of the scalp patients present a therapeutic challenge. In this report, we describe the case of a 78-year-old male patient having chronic recalcitrant ulceration on the scalp for 4 years, which was misdiagnosed and inappropriately treated with various topical agents. The use of oral acitretin 50 mg/day and tacrolimus ointment led to a complete and permanent remission.

Key Words: Acitretin; Scalp; Scalp dermatosis; Tacrolimus? Ulcer

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OLGU SUNUMU

KRONİK DİRENÇLİ DERMATOZ: ASİTRETİN VE TOPİKAL TAKROLİMUS İLE TEDAVİ EDİLMİŞ SKALPİN EROZİV PÜSTÜLER DERMATOZU

Öz

Skalpin Eroziv Püstüler Dermatozu, skatrisyel alopesi ve deri kanseri ile sonuçlanabilen kronik steril püstüllere ve iyileşmeyen erozyonlara neden olan skalpte yerleşim gösteren nadir bir hastalıktır. Hastalık genellikle yaşlı kişileri etkilemektedir. Skalpin Eroziv Püstüler Dermatozu hastalığının esas patogenezi bilinmemektedir ancak mikroskopik muayenede nötrofilik inflamasyon izlenir. Çeşitli medikal ve cerahi tedavilerin sınırlı etkinlik göstermeleri sebebi ile, Skalpin Eroziv Püstüler Dermatozu hastalarının tedavilerinde güçlük yaşanabilmektedir. Bu çalışmada dört yıldan beri mevcut olan skalp yerleşimli, yanlış tanı almış ve çeşitli topikal ajanlarla uygun olmayan şekillerde tedavi edilmiş kronik dirençli ülserasyonu olan 78 yaşında bir erkek hastayı sunmaktayız. Oral asitretin (50 mg/gün) ve takrolimus pomad kullanımı tam ve devamlı remisyonu sağlamıştır.

Anahtar Sözcükler: Asitretin; Skalp; Skalp dermatozu; Takrolimus; Ülser

INTRODUCTION

Erosive Pustular Dermatosis of the Scalp (EPDS) is an unusual inflammatory condition characterized by chronic amicrobial pustular erosions and crusts causing scarring alopecia. It typically affects the chronically photo-damaged skin of the elderly. Its exact pathogenesis is unclear; however, local trauma, radiotherapy, laser therapy, photodynamic therapy, herpes zoster disease and application of imiquimod and 5% fluorouracil cream have been indicated as potential causes (1-4). In addition, it is associated with autoimmune conditions (5). As the disease exhibits a progressive and chronic course, it is associated with a potential risk of neoplasia and may mimic recurrent skin cancer when it occurs at surgical sites(6). Secondary colonization is possible, but the cultures of typical lesions test negative. Histopathological examinations reveal nonspecific neutrophilic inflammation. The typical history and clinical presentation are the main indicators for diagnosing EPDS. Topical and systemic steroids are the most commonly used treatment options with limited efficacy.

Here we report an elderly male with a 4-year history of moderate-to-severe disease that was misdiagnosed as a chronic non-healing ulcer, which was unresponsive to several topical treatments. The patient achieved complete remission after subsequent treatments with oral acitretin and topical tacrolimus.

CASE

A 78-year-old man had been suffering from painful erosions and plaques with dirty crusts on his scalp for 4 years. He had no history of radiation, surgical or physical trauma preceding lesion development. His family history was unremarkable. He was previously diagnosed with coronary artery disease, diabetes mellitus, hypercholesterolemia and prostate hyperplasia. He had been admitted to various clinics and had been unsuccessfully treated with topical emollients, antifungals agents and antibiotics, as indicated by a non-healing scalp ulcer. Topical steroids that were prescribed for the provisional diagnosis of pemphigus foliaceus demonstrated limited efficacy. A scalp examination revealed multiple yellowish-green hyperkeratotic crusts and oozing erosions over the alopecic skin with actinic damage (Figure 1). A systemic examination revealed normal results with no lymphadenopathy. A provisional diagnosis of EPDS was made. Two skin biopsy specimens were obtained from the affected area on the scalp for histopathological and immunofluorescence examinations. Bacterial and fungal cultures were performed. The complete blood count, urinalysis results and serologic profile, including anti-nuclear antibody, were normal. Biochemical tests revealed mild hyperglycemia. Radiological investigations revealed normal findings. A histopathological examination (Figure 2) revealed subcorneal pustule formation and significant dermal oedema with stromal mucin. Alcian blue immunohistochemical staining demonstrated slight positivity.



Figure 1. Dirty yellow thick crusts and erosions on the scalp before treatment.

A direct immunofluorescence study revealed negative results for IgA, IgG, IgM and C3 deposits on the EPDS-affected skin. A potassium hydroxide examination revealed normal results. Bacterial and fungal cultures from the scalp discharge were negative. The clinical findings and chronicity of the patient and the therapy-resistant characteristic of the lesions together with supportive histological features and negative immunofluorescence findings suggested the diagnosis of EPDS. Prior treatments with antiseptics, topical steroids (mometasonefuroate 0.1% and clobetasol propionate 0.05%) and antimicrobials (mupirocin 2%) were unsatisfactory. We prescribed the application of tacrolimus ointment 0.1% twice a day, which demonstrated minimal clinical improvement after 4 weeks. As the patient had significant co-morbidities, oral acitretin 50 mg/day was initiated instead of systemic steroids. After approximately 2 months of the combination therapy of acitretin and tacrolimus, a complete clearance of active pustules, crusted ulceration with severe skin atrophy was observed. However, the patient's adherence to acitretin therapy was poor because of xerosis and intractable pruritus. Therefore, the dose was tapered to zero over the next month. Tacrolimus was used as a monotherapy twice a week for the following 2 months. No recurrence occurred after 18 months of follow-up (Figure 3).

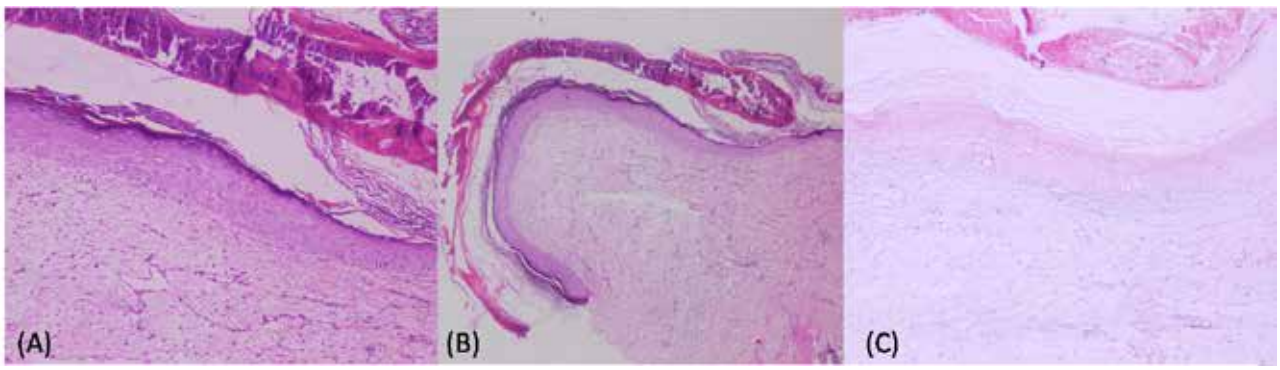


Figure 2. Subcorneal pustule formation is easily detected (Fig 2A, 2B). Dermis shows significant edema (Fig 2B) and Alcian Blue revealed faint positivity of under the epidermis (Fig 2C). H&E, Original magnification, A, C X100, B, X40



Figure 3. Resolution of the lesions after the treatment.

DISCUSSION

The typical clinical appearance on the atrophic and photo-damaged scalp of an elderly man made us suspect EPDS. Multiple differential diagnoses of this condition exist. In our patient, pustular psoriasis and subcorneal pustular dermatosis were excluded by histopathological examination. Immunofluorescence staining revealed no finding associated with immunobullous disorders, including pemphigus foliaceus, IgA pemphigus and cicatricial pemphigoid.

EPDS is generally accepted to be a rare, distinct entity, despite the publication of recent studies on it. The disease is difficult to treat. Typically, potent topical corticosteroids can only partially improve the clinical manifestations; however, recurrences are common after withdrawing the therapy. Numerous treatment options with various therapeutic benefits have been suggested (7-9). Among these, in recent years, tacrolimus has been more frequently recommended in anecdotal reports (10-12). Despite the common views asserting its carcinogenic effects with long-term use on UV-damaged skin, some authors have suggested tacrolimus as a first-line therapy for EPDS (11).

It is well known that retinoids have biological effects, including the alteration of follicular keratinization and suppression of sebaceous gland activity. Isotretinoin has been used for treating EPSD with successful results (13-15). To our knowledge, one report in the literature supports the efficacy of acitretin in treating EPDS (6). Notably, our patient exhibited satisfactory disease remission with acitretin as a systemic therapy in combination with topical tacrolimus 0.1%, without any recurrence observed during follow-up. This treatment protocol was chosen because of the prior long-term use of potent steroids and his poor medical condition.

In our patient, acitretin and topical tacrolimus proved to be highly beneficial. Regarding predisposing factors for skin cancer including sun damage and chronic ulceration, this combination seems to be preferable for compensating for the carcinogenic potential of tacrolimus in particular for fair-skinned individuals. Nonetheless, we would like to highlight that long-term, regular follow-ups are crucial, particularly for tacrolimus-treated elderly patients with photo-damaged atrophic skin.

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